ISAKOS newsletter

ISAKOS Newsletter 2011
VOLUME II

INSIDE THIS ISSUE

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2011 ISAKOS CONGRESS *Breaks All Records!*

ISAKOS would like to sincerely thank all who participated in the 8th Biennial ISAKOS Congress, held in Rio de Janeiro, Brazil on May 15–19, 2011. The 8th Biennial ISAKOS Congress was the most successful Congress in the history of our great society, thanks to the participation of the local organizers, members, faculty and attendees.

Held at the Riocentro Convention Center, the 8th Biennial ISAKOS Congress brought together more than 4,000 attendees, including spouses and exhibit personnel, from 83 countries, and included nearly 800 different presenters and faculty members.

Dr. Andreas Imhoff, Program Chair, with the assistance of the ISAKOS Program Committee, developed a busy, but extraordinary educational program. The 2011 ISAKOS Congress featured a 5-day scientific program, including more than 275 scientific papers, 550 electronic posters, 28 Instructional Course Lectures, 31 symposia, and 16 live surgical demonstrations, as well as lectures and debates. Presented topics varied widely and included presentations on all major joints, including shoulder, elbow, hip, knee and ankle; as well as a variety of hot topics such as biologics and PRP. All presentations reflected the vitality and variety that the ISAKOS Congress is known for around the world.

The 2011 ISAKOS Congress also offered additional educational opportunities, including a concurrent course on Sports Rehabilitation: *Global Perspectives for the Physical Therapist and Athletic Trainer*. This course was attended by more than 200 physicians, athletic trainers, physical therapists, and coaches concerned with the management and prevention of injuries to the athlete.

ISAKOS was also pleased to offer three pre-courses, held at the Windsor Barra Hotel on Saturday, May 14, 2011. These courses were attended by more than 600 surgeons, and topics included *Olympic Games: From Basic Science to the Gold Medal*, *Biologic Treatment Options for the Knee* and *Spotlight on Top Orthopaedic Procedures in Sports Medicine*. Special thanks to the Pre-Course Chairs who made these courses possible!

On behalf of the ISAKOS Board of Directors, Executive Committee and Program Committee, thank you to all who attended the 2011 ISAKOS Congress. It is your international perspectives and participation that makes the ISAKOS Congress a fantastic and worthwhile educational event.

For more on the* ISAKOS CONGRESS, *(including photos!), please see page 18.

EDITOR'S NOTE

Evidence-Based Passion for ISAKOS

The 8th Biennial ISAKOS Congress demonstrated evidence-based passion for our growing international society.

ISAKOS Congress attendees were present in record numbers in Rio de Janeiro, Brazil. These numbers, described elsewhere in the Newsletter, represent quantitative evidence of the society's growth. While credit for the growth of ISAKOS is shared by Past Presidents, current President and 2011 Congress local host Moises Cohen, and the ISAKOS office staff led by Michele Johnson; it seems that the primary reason for the growth of ISAKOS is word of mouth. Members tell colleagues of our scientific rigor, cultural competence, and international exchange, and colleagues tell two friends, and they tell two friends, and so on, and so on. The result: ISAKOS demonstrates evidence-based, near exponential and unprecedented growth.

ISAKOS members demonstrate evidence-based passion for our Society, and for the work we do. Attendees, and our guests, traveled from far and wide to participate at the Congress in Rio de Janeiro. Despite the global economic recession and the financial challenges of medicine, Congress participants (in record numbers, as above) took time from their practices, purchased plane tickets, secured lodging, and dined abroad at some personal, financial sacrifice. Clearly, we are motivated by something greater than money. This can only represent an evidence-based passion for knowledge, international friendship, and arthroscopy, knee surgery, and orthopaedic sports medicine education which can only be garnered through personal interaction and on-site exchange. We love what we do. We enjoy and grow from spending time in the company of others with our shared interests and passion. We demonstrate evidence-based passion for continuing education, and Congress participation is its own priceless reward.

On-site at the Congress, we observed that the industry booths were crowded and the lecture halls full. Despite the marvelous allure of the beaches and tourist attractions, the football, golf, and tennis, and the caipirinha, churrascaria, and samba, Congress participants made the effort to wake early, travel to the Riocentro Convention Center, attend the symposia and instructional courses, ask questions, participate in group and one-on-one discussions, linger in the exhibit hall, and return to do it again the next day. Vacation is fun and important, yet we were in Rio de Janeiro for ISAKOS, and the choice to not only go to the meeting but participate in the meeting represents our evidence-based dedication.

ISAKOS has matured over time, and we continuously observe that the science, the research, the demonstrations and the presentations reached a new level of quality. Having personally served on the ISAKOS Program Committee for the 2011 Congress under the leadership of Andreas Imhoff, Marc Safran, and ISAKOS Past-President Freddie Fu, I disclose that the quality of abstracts submitted for the 2011 ISAKOS Congress were of such high-level that only those abstracts with near-perfect scores were accepted for podium presentation. This represents evidence-based proof of the quality of our efforts.

In sum, I see evidence-based proof of the promise that the future of ISAKOS is bright. Enjoy this current issue of our Newsletter, and please feel free to pass it along to a colleague to encourage them to join our diverse and growing society.

***James* H. *Lubowitz*, MD**
ISAKOS *Newsletter Editor*, 2011–2013

PRESIDENT'S MESSAGE

Dear Family in ISAKOS,

ISAKOS *Tennis Tournament Participants, 2011 ISAKOS Congress*

Thank you to all who attended the 2011 ISAKOS Congress, held in Rio de Janeiro, Brazil on May 15–19, 2011. The meeting was a fantastic success thanks in large part to the Program Committee, under the direction of Program Chairman Andreas Imhoff, Germany, and Marc Safran, USA. Additional thanks are due to the local assistance of Marcos Musafir, Benno Ejnisman, Paulo Lobo and Marcelo Campos – without their help, the Congress would not have been possible.

Finally, special thanks to the faculty and presenters – it is your international perspective, knowledge and passion for our specialties that makes the ISAKOS Congress an incredible educational event for all who attend. We hope that all Congress attendees enjoyed both the educational and social components of the meeting, including our first ever ISAKOS World Cup and Tennis Tournaments!

I stand on the shoulders of giants as the current president of ISAKOS. I thank all the past presidents and directors who have given me the support and orientation to get this important position. I especially thank my predecessor Freddie Fu, ISAKOS President 2009-2011, for his tireless promotion and work on behalf of ISAKOS. I also want to thank all the ISAKOS Office team, led by Michele Johnson, who do such fantastic work for our society.

Looking forward to the next two years as your president, I would like to take a moment to thank you for your involvement with our society. ISAKOS is a melting pot, with more than 3,600 members from 90 different countries. This diversity is what makes ISAKOS different from any other society. However, it also presents unique challenges for our leadership. ISAKOS values all members and seeks to make each members' experience with ISAKOS as positive as possible. We encourage all members to participate in ISAKOS activities – submit an abstract for a Congress, follow ISAKOS on Facebook and Twitter, check in with the Office, request to join a committee, attend an ISAKOS Workshop, and hold an ISAKOS Approved Course! Additional information about ways to participate and become more involved with ISAKOS are available online at www.isakos.com.

2011 ISAKOS *Congress Registration Area, May 15, 2011*

Additionally, ISAKOS will be making an effort to be more communicative with our members. Have a question about an ISAKOS activity or policy? Please send questions via email to isakos@isakos.com. As an Executive Committee and Board of Directors, our job is to work for you – our members! We will make an effort to respond to each email received, and may even publish questions submitted in future issues of this Newsletter, the ISAKOS eNews, or through the ISAKOS Update emails. ISAKOS Update emails will be sent on a regular basis with valuable information about ISAKOS policies, activities and upcoming events. Look for the ISAKOS Update in your in-box soon!

ISAKOS has much to look forward to in the coming years. We are especially proud of the success and support received of the ISAKOS Global Connection Campaign, which was officially kicked-off in Rio de Janeiro. For more information related to the Global Connection Campaign, please refer to page 15 of this Newsletter.

We also look forward to the launch of the ISAKOS Global Link – ISAKOS' eLearning platform, the start of the ISAKOS Scientific Grants program, and many more committee projects. Our committees are working hard for our members to provide the best education and information possible!

I look forward to serving as your President leading up to the 9th Biennial ISAKOS Congress in Toronto, Canada.

***Thank you for your support and membership with* ISAKOS**–it is our membership that makes us the fantastic society that we are!

Dr. Cohen prepares to participate in the ISAKOS *World Cup, held during the* 2011 ISAKOS *Congress*

***Moises Cohen*, MD, PhD**
ISAKOS *President* 2011–2013

ISAKOS WELCOMES NEW MEMBERS

Pablo Eduardo Aguirre, MD, ARGENTINA
Adil Ajuied, MBBS BSc(Hons) FRCS(Tr&Orth) MSc, UNITED KINGDOM
Arnoldo Albero, MD, ARGENTINA
Diego Albertengo, MD, ARGENTINA
Ahmed Hassan Alhaizaey, MD, SAUDI ARABIA
Daniel Apablaza, MD, CHILE
Rajiv Sunny Arimboor, MD, OMAN
Ignacio Enrique Astore, MD, ARGENTINA
Diego Astur, MD, BRAZIL
Abdulrahman Abdulla Babaqi, Master (MSc), EGYPT
Tareq Mohammed Badawi, MD, UNITED ARAB EMIRATES
Jaime Vivas Barrera, MD, COLOMBIA
Bernardo Garcia Barroso, MD, BRAZIL
Pedro Gouveia Bastos, MD, BRAZIL
Dietmar Baumann, MD, GERMANY
Joseph Bellapianta, MD, USA
Johan Botha, FC Orth(SA), MMed Ort(Pta), SOUTH AFRICA
Mikael Yves Bouleau, MD, SWEDEN
Tulio Taft Bovaretto, MD, BRAZIL
Sven Erwin Brandt, MD, NETHERLANDS
Mats Brittberg, MD, PhD, SWEDEN
Luis Eduardo Pedigoni Bulisani, MD, BRAZIL
Emilio Calvo, MD, PhD, MBA, SPAIN
Miguel A. Carrasco, MD, CHILE
Fernando Andres Carreño, MD, COLOMBIA
Khavari Ali Chashm, MD, IRAN
Ali Chashm Khavari, MD, IRAN
James L Chen, MD, MPH, USA
Samuel Byung Mo Cho, MD, BRAZIL
Kinga Ciemniewska-Gorzela, MD, POLAND
Sarah Jane Clark, MD, CANADA
Carina Cohen, MD, BRAZIL
Marco Túlio Costa, MD, BRAZIL
Pedro Costa, MD, PORTUGAL
Olivier Courage, MD, FRANCE
Francisco Bruno Nogueira Cruz, MD, BRAZIL
Marcos Vinícius Muriano Da Silva, MD, BRAZIL
Adriano De Aguiar, MD, BRAZIL
Cézar Augusto Costa De Castro, MD, BRAZIL
Luis Eduardo De Toledo, MD, BRAZIL
Aníbal Debandi, MD, CHILE
Patrick J Denard, MD, USA
Rodrigo Dolz, MD, CHILE
Cristian Dominguez, MD, CHILE
Raju Easwaran, MS (Orth), INDIA
Leandro Ejnisman, MD, BRAZIL
Simon Ellis, MA MBBS FRCS (Orth), UNITED KINGDOM
Mohamed Ahmed Elsheikh, MD, EGYPT
Mohie Mahamoud Fadel, MD, EGYPT
Tiago Lazzaretti Fernandes, MD, BRAZIL
João Paulo Fernandes Guerreiro, MD, BRAZIL
William Martins Ferreira, MD, BRAZIL
Eduardo Antonio Figueiredo, MD, BRAZIL
Esteban Martin Filippa, MD, ARGENTINA
Jose Eduardo Nogueira Forni, PND, BRAZIL
Lucio Nuno Favaro Lourenço Francisco, MD, BRAZIL
Carlos A. Frutos, MD, PARAGUAY
Jose Carlos Garcia Jr., MD, BRAZIL
Richard Gayle, MD, USA
J. Robert Giffin, MD, FRCSC, CANADA
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Armando Jose Guillen, MD, VENEZUELA
Sasan Habibzadeh Miyandoab, MD, PhD, CANADA
Bryan T Hanypsiak, MD, USA
Daniel Heckman, MD, USA
David Hollinghurst, MA FRCS (Tr & Orth), UNITED KINGDOM
Horng-Chaung Hsu, MD, TAIWAN
Werner Hurter, MD, SOUTH AFRICA
Mark Robert Hutchinson, MD, USA
Toshio Inoue, MD, JAPAN
Matthias Jacobi, MD, SWITZERLAND
Sangil Jeong, MD, KOREA
Deryk Jones, MD, USA
Kaori Kashiwa, MD, JAPAN
Claudio Kawano, MD, BRAZIL
Jong-Min Kim, MD, PhD, SOUTH KOREA
Kitiphong Kongrukgreatiyos, MD, THAILAND
Nanne P Kort, MD, PhD, NETHERLANDS
Jacek Kowalczewski, MD, POLAND
Sameh A Labib, MD, USA
Mauricio Largacha, MD, COLOMBIA
Carlos Leal, MD, COLOMBIA
Jong Ha Lee, MD, KOREA
Ofer Levy, MD, MCh(Orth), UNITED KINGDOM
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Abdolmohammad Liaghat, MD, USA
Danilo Lopes, MD, BRAZIL
Emilio Lopez-Vidriero, MD PHD, SPAIN
Nur Rachmat Lubis, Specialist, MD, INDONESIA
Akira Maeyama, MD, JAPAN
Robert A. Magnussen, MD, USA
Marcelo Mamede De Freitas, MD, BRAZIL
Naude Marais, M.Med (Orth), FC Orth SA, SOUTH AFRICA
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William Henry Marquez, MD, COLOMBIA
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Randy Mascarenhas, MD, CANADA
Gustavo Matheus Valdivieso, MD, VENEZUELA
Gen Matsui, MD, JAPAN
Robert G Mccormack, MD, CANADA
Francisco Mendes Ferreira Neto, MD, BRAZIL
Adriano Fernando Mendes, Jr., MD, BRAZIL
Manuel Mendonca, MD, PORTUGAL
Konstantin Kalco Mitev, MD, MACEDONIA
Hiroshi Mizuta, MD, PhD, JAPAN
Alberto Ma Villanueva Molano, MD, PHILIPPINES
Joan Carles Monllau, MD, PhD, SPAIN
Guillermo Antonio Morales, MD, VENEZUELA
Mohamed Gamal Morsy, MD, PhD, EGYPT
Atsuo Nakamae, MD, PhD, JAPAN
Lisandro Nardin, MD, ARGENTINA
Nebojsa Nastov, MD, MACEDONIA
Joshua David Nelson, MD, PharmD, USA
JOSE FRANCISCO NUNES NETO, MD, BRAZIL
Alexandre Pedro Nicolini, MD, BRAZIL
Roberto Kouetsu Nishi, MD, BRAZIL
Cameron Norsworthy, MBBS, FRACS, AUSTRALIA
Masahiro Nozaki, MD, PhD, JAPAN
Raymond Yrreverre Nunez, MD, PHILIPPINES

Roger Leandro Nunes Ogassawara, MD, BRAZIL
Munehiro Ogawa, MD, JAPAN
Marlon Alves Subtil De Oliveira, MD, BRAZIL
Oscar Julian Padilla Lopez, MD, COLOMBIA
Hiram Rafael Padron, MD, VENEZUELA
Alexandre Paiva Luciano, MD, BRAZIL
Evgenia Papadakou, MD, GREECE
Derek Francis Papp, MD, USA
Gherardo Pasquinucci, MD, ITALY
Hamid Pedram, MD, IRAN
Marcio Ferreira Penha, MD, BRAZIL
Andre Luiz Silva Pereira, MD, BRAZIL
Francesco Antonio Perrini, MD, ITALY
André Luiz de Campos Pessoa, MD, BRAZIL
Robert Petanceski, MBBS, FRACS, AUSTRALIA
Paulo Eduardo Pileggi, MD, BRAZIL
Carolina Pisanti, MD, VENEZUELA
Carlos Henrique Poisl Junior, MD, BRAZIL
Luis Fernando Prampero, MD, BRAZIL
Fábio De Castro jorge Racy, MD, BRAZIL
Eduard Rakhmankulov, MD, RUSSIA
Eslam Karamallah Ramadan, MD, EGYPT
Sean Oliver Rassman, MD, USA
Mark James Richardson, MBBS, FRACS, AUSTRALIA
Gustavo Andres Rincon, MD, COLOMBIA
Roberto Pedersen Ruthner, MD, BRAZIL
Ariel E Saldaña, MD, PANAMA
Daniel Salem, MD, VENEZUELA
Alexandre Goncalves Santoro, MD, BRAZIL
Antonio Fernando Santos, MD, BRAZIL
Ken Sasaki, MD, JAPAN
Alexandre Adorno Sattin, MD, BRAZIL
James Franklin Scoggin, MD, USA
Armando Romani Secundino, MD, BRAZIL
Otavio De Melo Silva Jr, MD, BRAZIL
Daniel Cordeiro Silva Junior, MD, BRAZIL
Hua Ming Siow, MD, SINGAPORE
Karina Levy Siqueira, MD, BRAZIL
Thomas Victor Smallman, MD, USA
Luiz Fernando Machado Soares, MD, BRAZIL
Luis Fernando Sobrino, MD, ARGENTINA
Heetor Campora Sousa Oliveira, MD, BRAZIL
Francisco Rocha De Souza, MD, BRAZIL
Bruno Gonçalves Schroder e Souza, MD, BRAZIL
Anders Stalman, MD, PhD, SWEDEN
Taís Stedile Busin Giora, MD, BRAZIL
Mark E. Steiner, MD, USA
Steven James Svoboda, MD, USA
Jan-Willem Swen, MD, NETHERLANDS
Paulo Roberto Queiroz Szeles, MD, BRAZIL
Mohammad Naghi Tahmasebi, MD, IRAN
Bernardo Barcellos Terra, MD, BRAZIL
Alexandre Terruggi Jr., MD, BRAZIL
Thomas Tischer, MD, GERMANY
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Sikri Mimia Tukiainen, MD, FINLAND
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Ramiro Vargas Vazquez, MD, MEXICO
Alp Varilsüha, MD, TURKEY
Jaime Vasquez Yzaguirre, MD, PERU
Tomas Rafael Vilaseca, MD, ARGENTINA
Rafael Visbal, MD, COLOMBIA
Austin Vo, MBBS, FRACS (Orth), AUSTRALIA
Paulo Zambrano Wageck, MD, BRAZIL
Ahmed H Waly, MD, EGYPT
Taufin Warindra, MD, INDONESIA
Wojciech Widuchowski, MD, PhD, POLAND
Coen Abel Wijdicks, PhD, USA
Leonardo Winkler, MD, BRAZIL
Greg Witherow, FRACS, AUSTRALIA
Ho Yeon Won, MD, KOREA
Kevin Wong, FRCSEd(Orth), FHKCOS, FHKAM(Ortho), HONG KONG
Ivan Wong, MD, CANADA
Ricardo Yabumoto, MD, BRAZIL
Ricardo Hideki Yanasse, MD, BRAZIL
Yu-Ping Yang, MD, CHINA
Yoon Seok Youm, MD, KOREA
Marcos Zalcman, MD, BRAZIL

COME

ISAKOS Mission Statement

ISAKOS *advances the worldwide exchange and dissemination of education, research and patient care in arthroscopy, knee surgery and orthopaedic sports medicine.*

www.isakos.com

MEMBERS

NEW MEMBERS

We depend on our members to make the society what it is today and to embrace the potential it has in the future. It is the responsibility of members to recruit NEW MEMBERS to join ISAKOS and its goal to reach across the world.

Download an application online at **www.isakos.com** or contact the ISAKOS office at +1 (925) 807–1197 for a NEW MEMBER Recruit Packet.

ISAKOS MEMBERSHIP CATEGORY

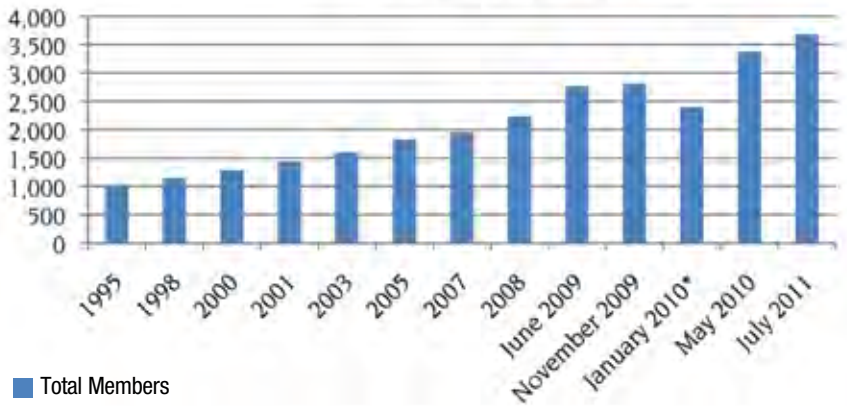
# of Members	Category
1989	Active
17	Affiliate
20	Applicant
685	Associate
746	Corresponding
184	Emeritus
15	Honorary
21	Fellow
3677	**- Total Count -**

ISAKOS MEMBERSHIP GROWTH

Year	Total Members
1995	1,005
1998	1,141
2000	1,282
2001	1,437
2003	1,598
2005	1,828
2007	1,958
2008	2,231
June 2009	2,763
November 2009	2,809
January 2010*	2,396
May 2010	3,374
July 2011	3,677

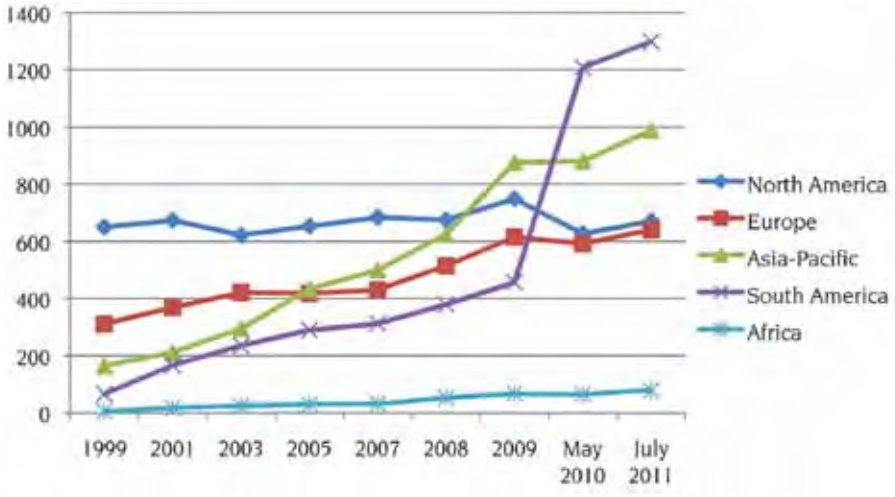
* ISAKOS frequently suspends members who have failed to pay their ISAKOS Membeship Dues.

TOTAL MEMBERS



ISAKOS MEMBERSHIP GROWTH BY REGION 1999 TO JULY 2011

Growth by Region	1999	2001	2003	2005	2007	2008	2009	May 2010	July 2011
North America	650	673	622	653	684	675	748	627	671
Europe	311	369	421	418	430	514	615	592	640
Asia-Pacific	165	211	295	433	500	624	876	881	988
South America	66	166	235	289	312	379	457	1209	1299
Africa	6	18	25	30	32	53	67	65	79
TOTAL	**1,198**	**1,437**	**1,598**	**1,828**	**1,958**	**2,245**	**2,763**	**3,374**	**3677**



Are you using YOUR ISAKOS *Member Benefits?*

- Subscription and Online Access to *Arthroscopy*: ***The Journal of Arthroscopic and Related Surgery***
- ISAKOS Newsletter & eNews
- ISAKOS Global Link – Coming Soon!
- ISAKOS International Fellowship & Residency Directory – Applications accepted from Members Only!
- Optional online access to **KSSTA**–the official Journal of ESSKA

ISAKOS Members now receive **FREE** Online Access to ***Cartilage***, the official journal of the International Cartilage Repair Society. Free online access will be available until December 2012.

For those members interested in receiving a mailed subscription to ***Cartilage***, SAGE Publications is offering ISAKOS members a 20% discount for a total cost of $158.

Cartilage focuses on both clinical and basic science perspectives of the diverse disciplines in cartilage research and repair. ***Cartilage*** publishes articles on cartilage biology including repair, development, function, and transplantation. Articles on clinical, laboratory, and therapeutic research are included as well as review articles, editorials, and letters.

OFFICE REPORT

The ISAKOS Office would like to thank all who participated in the 2011 ISAKOS Congress in Rio de Janeiro! Our office staff was pleased to meet so many new members, as well as catch up with long-term members. Special thanks are due to Andreas Imhoff, Germany, and Marc Safran, USA for their tireless work on the ISAKOS Congress scientific program. All members of the ISAKOS Program Committee should be commended for their diligence and dedication to producing such a high-quality scientific program. The ISAKOS Office also thanks the ISAKOS Executive Committee and Board of Directors for their hard work and commitment to ISAKOS.

Additionaly, ISAKOS would like to thank our 8th Biennial Congress Platinum sponsors – Arthrex, ConMed Linvatec, DePuy Mitek, DJO Global and Smith & Nephew. Thank you also to Tornier, ISAKOS Congress Gold Sponsor, and our Silver Sponsors – ArthroCare, B. Braun, Genzyme, Karl Storz, and Stryker. ISAKOS thanks these companies for their support of international education, as well as all other Congress exhibitors.

Special thanks to the ISAKOS surgical demonstration assistants, Judy Cooper, Santana Gonzales, and Rich Leutheuser. These staff assisted in the Surgical Demonstration live broadcasts – a highlight of the ISAKOS Congress! Their assistance is appreciated by the surgical demonstration faculty and our industry supporters. As always, ISAKOS also thanks Integrated Events Management for their excellent Audio Visual coordination.

The ISAKOS Office is already hard at work on the 2013 ISAKOS Congress, to be held in Toronto, Canada on May 12–16, 2013. For more information on the 9th Biennial Congress, or to submit your abstracts, please visit **http://www.isakos.com/meetings/2013congress/**.

Moving forward, the ISAKOS Office's goal is to increase communication with our members. We work closely with our committees, but will be making efforts in the coming year to communicate more with our members via Twitter (@ISAKOS), Facebook, and email communication.

The ISAKOS Office appreciates the dedication of Donna Festo, Elizabeth Collins-Gibson, Katie Anderson, Beverlee Galstan, Hilary Matthews, and Morgan Huffy. We look forward to working closely with Dr. Moises Cohen, and the ISAKOS Board of Directors, Executive Committee, and all other ISAKOS Committees to continue the great work of ISAKOS.

Michele Johnson
ISAKOS Executive Director

ISAKOS 2011–2013 COMMITTEES

ISAKOS COMMITTEE MEMBERS APPOINTED

Following the ISAKOS Congress in Rio de Janeiro, Brazil, the Committee on Committees and ISAKOS President Moises Cohen, MD announced the 2011–2013 committee members.

BOARD OF DIRECTORS

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Joao Espregueira-Mendes, MD, PhD, PORTUGAL, Consultant
Freddie H. Fu, MD, USA, Past President

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Fernando Radice, MD, CHILE
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Patrick Yung, FRCS(Orth), FHKCOS, FHKAM, FRCS, MBChB, HONG KONG

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José Ricardo C. Varatojo, MD, PORTUGAL
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Ramon Cugat, MD, PhD, SPAIN, Past Chair

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YOUR COMMITTEES AT WORK

EDUCATION COMMITTEE



The ISAKOS Education Committee met during the 8th Biennial ISAKOS Congress in Rio de Janeiro and unanimously adopted the mission to 'Develop a multi-facet and multi-dimensional education program meeting the scientific, clinical and practice-related needs for members'. Emphasis was laid on the need to develop a comprehensive CME program, to lay down criteria for the review and approval of ISAKOS Teaching Centers and Approved Courses, and to identify world gaps in education and training. The Education Committee will also work to develop ISAKOS planned courses around the world, and courses to "teach the teachers". The need for internal cooperation among the various committees was stressed to accomplish this task. It was proposed to bring out current concept booklets, surgical technique DVD's and arthroscopy supplement with emphasis on a special topic for the benefit of the members.

A primary focus of the Education Committee will be the ISAKOS Global Link, ISAKOS' online knowledge center for Arthroscopy, Knee Surgery & Orthopaedic Sports Medicine. The Global Link will provide access to ISAKOS enduring educational material, including online courses, surgical demonstration videos, Congress archives, Committee projects, Newsletter features and more. The Committee also hopes to assist ISAKOS in organizing courses for surgeons from developing countries, including hands-on courses for the benefit of young surgeons with corporate support. It was also decided to have educational meetings in the year between congresses in various developing countries as part of the effort to make quality training available to the surgeons from those regions.

We would like to thank all the involved EC Members for their acceptance and commitment to fulfill our Education goals.

We also believe that our contribution will approach ISAKOS members and invite new ones!

We will have our conference call in September and our next meeting will be in San Francisco, February 2012.

João Espregueira Mendes, Alberto Gobbi & Mark Miller
Committee Chair and Deputy Chairs

KNEE COMMITTEE



The Knee Committee would like to thank those who participated in the Knee Committee organized Pre-Course on Biologic Treatment Options for The Knee. Special thanks to chairman Tony Miniaci and his co-chairs, Martin Lind and Frederick Almqvist – this course was a great success! The Knee Committee hopes to convert each presentation into an evidence-based manuscript for publication in a supplement of the Journal of Arthroscopy.

The Knee Committee participated in selection of the 2011 Albert Trillat Young Investigator's Award, the Patellofemoral Research Excellence Award, and the Patellofemoral Traveling Fellowships. The award selection and grading process was reviewed and recommendations were made to modify these processes. For more information on Award Winners, please refer to page 22 – 23.

The Knee Committee has developed a systematic approach to future contributions of the Newsletter. Our goal is to avoid repetition and insure balanced coverage of all facets of knee surgery.

One of the most important charges for the Knee Committee is to propose and develop a pre-course for the 2013 Congress. The Committee is hard at work developing the topics and faculty for a Pre-Course, and more information on available Pre-Courses will be sent to ISAKOS members in the coming months.

Finally, the Committee is proposing an annual educational knee surgery course in a less developed country. The main goals of this course are to raise awareness of the importance of early diagnosis and management of sports related injuries and the impact they can have on the athlete's career, as well as train to local surgeons. This course will be chaired by Willem Van Der Merwe.

The next meeting of the Knee Committee will be held during the AAOS meeting in February 2012.

Allen F. Anderson, David Parker & Willem van der Merwe
Knee Committee Chair & Deputy Chairs

MEMBERSHIP COMMITTEE

The ISAKOS Membership Committee met during the ISAKOS Congress in Rio de Janeiro, Brazil to discuss the status of our current membership numbers and to brainstorm ways in which we can obtain and grow our Membership Numbers. Thank you to all of the Membership Committee Members who were able to attend the meeting.

Currently, ISAKOS has 3,667 Members and we are growing daily! Through joint memberships with international arthroscopy, knee surgery and orthopaedic sports medicine societies we continue to expand our membership numbers.

During the Committee meeting in Rio de Janeiro, the need for more communication with the ISAKOS Members was discussed. Beginning shortly, the ISAKOS Office will begin sending frequent email updates to the ISAKOS Members regarding current projects, upcoming events and meetings and general ISAKOS information. It is our hope that through increased communication we can become an even stronger unified society.

Currently, the Membership Committee is focusing on the Fellowship & Residency Registry. Following the Mission Statement of ISAKOS to "advance the worldwide exchange and dissemination of education, research and patient care in arthroscopy, knee surgery and patient care," the Fellowship and Residency Registry will help promote ISAKOS to younger members. Inclusion in the Registry is a member benefit available exclusively to members of ISAKOS. A member of the faculty or chair of each program must be a member with ISAKOS to register their program. We strongly encourage all fellowship and residency programs to participate in the ISAKOS International Fellowship & Residency Registry. To join the Registry, please visit the ISAKOS website and complete the information request form.

The next meeting of the Membership Committee will be at the AAOS Meeting in San Francisco, 2012.

Benno Ejnisman
ISAKOS Membership Committee Chair

SCIENTIFIC COMMITTEE

The Scientific Committee is busy working on our projects for the 2013 ISAKOS Congress in Toronto and beyond. For the 2013 Congress, we are planning for symposia and instructional courses to maximize the scientific quality of the meeting. Norimasa Nakamura has organized a combined symposium on joint preservation with ICRS. This will be a collaborative presentation at both the ICRS meeting in 2012 in Montreal and also at the ISAKOS Congress in Toronto in 2013. Among other courses and lectures, we are also planning a course on evidence based medicine applied to ACL research. This course will teach how to critically evaluate clinical ACL research and also how to plan studies in this area. We will continue to evaluate and score for both the Scientific Award and the Nicola's Foundation Young Researcher Award.

We are also working on several newsletter articles. In particular, please visit page 27 to read our article on ACL surgical technique for drilling the femoral tunnel.

A major initiative of the Scientific Committee is to develop grants to fund research by ISAKOS members based on a competitive peer reviewed process. The grants will be clinical in nature and the focus will be on collaborative international multicenter research. We hope to determine the mechanism for the grant application process in the next few months. We believe that this granting process will attract new members to ISAKOS in order to apply for the grants, improve the scientific quality of ISAKOS research, and ultimately improve our Congress.

Robert Marx, Norimasa Nakamura and Stefano Zaffagnini
ISAKOS Scientific Committee Chair & Deputy Chairs

STRATEGIC PLANNING COMMITTEE

This year the Strategic Planning Forum was held in Rio de Janiero, on Saturday May 14 just prior to the ISAKOS Congress. Forty invited Members participated in four discussion groups.

Education ..... Lead by Joao Espregueira-Mendes
Research..... Lead by Robert Marx
Membership ..... Lead by Mahmut Nedim Doral
Financial Planning..... Lead by Philippe Neyret

From the Forum Group Reports, the ISAKOS Strategic Plan 2011-2013 has been developed and adopted by the ISAKOS Board of Directors in Rio de Janeiro.

Our Strategic goals remain consistent.

- To promote **Education** beyond the biennial Congress, through online education, ISAKOS publications, ISAKOS Teaching Centers and ISAKOS courses and workshops.
- To increase **Membership** by working with partner societies and national societies in other regions (eg Middle East, Africa). To promote Membership for younger surgeons and to promote Affiliated Membership for allied health professionals.
- To develop a **Scientific Research Grants** program based on a competitive peer reviewed process. These grants will be clinical in nature and the focus will be on collaborative international multicenter research.
- To establish a fund for Education and Research and to establish a Reserve Fund for ISAKOS long-term **financial security**.

The ISAKOS Strategic Planning Committee will continue to work closely with the ISAKOS Board of Directors and Executive Committee to develop action plans related to these initiatives. More information on these activities will be available in the coming weeks.

Barry Tietjens

UPPER EXTREMITY COMMITTEE

The Upper Extremity Committee had a strong participation at the last ISAKOS Congress in Rio. Their members were successfully involved in Instructional Courses, Symposia, Live Surgical Demos and the very fruitful Spotlight on Top Orthopaedic Procedures in Sports Medicine Pre-Course. The Congress' Program was excellent and the Upper Extremity Committee will continue to collaborate with the Program Committee to make 2013 ISAKOS' Congress in Toronto a great success.

The Caspari Award was awarded to Hirotaka Sano MD from JAPAN with his paper: "Stress Distribution Inside The Bone After Suture Anchor Insertion". Mohamed Shafi MD, from INDIA and Sedeek Mohamed Mosaid FRCS, from SINGAPORE were the recipients of the 2011 and 2012 Upper Extremity Travelling Fellowships. They will be able to visit the main ISAKOS Teaching Centers all over the world. We strongly recommend all members to apply for these wonderful opportunities to travel increasing their knowledge. Applications for these awards will open with ISAKOS Congress Abstract Submission on August 1, 2011.

The A-C Joint Project lead by Klaus Bak was successfully accomplished. A report on determining the best approach for treating these demanding injuries this project can be found on page 33 of this Newsletter.

Two new projects are in the committee's pipeline. The UEC is involved, together with the Arthroscopy Committee, in the Shoulder Terminology Project. Three committee teams (instability, rotator cuff and A-C joint) lead by Eiji Itoi, Gregory Bain and Klaus Bak, together with the UEC members', are reviewing and trying to arrive at a consensus about definitions, classifications and scores. Achieving these goals will help the ISAKOS members to improve the way to collect and evaluate their data.

Guillermo Arce, MD
ISAKOS Upper Extremity Committee Chair

Klaus Bak, MD
ISAKOS Upper Extremity Committee, Past Chair

For more on the ISAKOS CONGRESS, *(including photos!), please see page* 18.

ISAKOS Global Connection

A Campaign for Education, Research and Collaboration

At the 2011 ISAKOS Congress in Rio de Janeiro, Anthony Miniaci, MD, Chair of the ISAKOS Development Committee formally announced that the Society has begun a new phase in its fundraising efforts - the ISAKOS Global Connection: A Campaign for Research, Education and Collaboration. The goal of the ISAKOS Global Connection Campaign is to provide ongoing support for the long-term, strategic research and education goals of the Society.

Dr. Miniaci, selected as Development Chair by the ISAKOS Board of Directors, introduced the members of the Committee, including Drs. Moises Cohen, Ramon Cugat, Lars Engebretsen, Freddie Fu, Dimitr Alexander Jontschew, Jon Karlsson, Masahiro Kurosaka, Robert Marx, Philippe Neyret, Kevin Plancher, Fernando Radice, Barry Tietjens, Willem van der Merwe, and Luis Vargas.

The financial goal of the Global Connection Campaign is to raise ten million dollars from industry and individuals by the 2013 ISAKOS Congress. During the kick-off ceremony in Rio, Dr. Minaici reported that ISAKOS industry partners had generously pledged five million dollars to the Campaign, and asked ISAKOS members to consider multi-year pledges to the Global Connection.

ISAKOS corporate supporters include President's Circle sponsor Smith & Nephew, Cornerstone Circle sponsors Arthrex and Stryker, Director's Circle sponsors Biomet, ConMed Linvatec, DJO and DePuy Mitek, and Chairman's Circle sponsors Breg and Tornier. We sincerely thank these companies for their support!

HOW TO DONATE

Donations may be made through the ISAKOS office, or via the Campaign website: www.isakos.com/campaign.

Why a New Campaign?

ISAKOS's membership now totals over 3,600 members from 93 countries, and our membership continues to climb significantly each year. As more physicians from countries such as Brazil, India and China join the Society, the need to provide high-quality, effective and accessible education worldwide is the number one goal for the Society. The ISAKOS Biennial Congress has long been recognized as a premier global educational opportunity, but ISAKOS leadership recognizes the need to develop additional educational programs and resources for its members, in addition to the Congress. Funds are necessary to support the Society's international symposia and workshops, as ISAKOS is planning 2011–2012 programs in China, India, Italy and Columbia.

In addition, the ISAKOS Scientific Committee, led by Dr. Robert Marx (USA), recognizes the necessity to establish an international, competitive research grants program. The development of this long-term initiative is to encourage and fund research by ISAKOS members throughout the world.

Grant categories under consideration include:

- Multi-center clinical or basic science research, international collaboration preferred
- Resident/fellow research projects
- Regional awards, including South America, Africa, Asia/Pacific, Eastern Europe
- A portion of the funds raised from the Global Connection Campaign will be used to support this new initiative.

Member Giving to the Campaign

In addition to industry support, ISAKOS is asking our members to donate to the Campaign, either on a one-time basis, or through multi-year pledges. One special donation option Dr. Miniaci detailed to the membership during the Campaign kick-off is the ISAKOS Godfather Initiative.

The Godfather Initiative is designed to provide tangible benefits to members who pledge a minimum of $5,000 over five years to the Campaign. The Godfather Initiative will allow current members of ISAKOS to sponsor a deserving member from a developing region in the world for five years, and a portion of your multi-year pledge will be allocated specifically towards an individual's membership. The donor will be recognized as a Global Connection Campaign supporter, and specifically as an ISAKOS Godfather.

Benefits to godfathers will include a reception at ISAKOS Congress, access to the Godfather Lounge at the ISAKOS Congress, premier recognition in Campaign materials, in the ISAKOS Newsletter and on the Campaign and ISAKOS websites.

Looking Ahead

Recognizing our unique position as the only orthopaedic medical association of its kind with a global constituency, ISAKOS leadership is committed to increasing the effort to educate our members in all areas of the world through partnership with regional organizations and industry leaders. Bringing together local organizations, respected surgeons and industry, ISAKOS will advance our mission to create an international framework for the exchange and dissemination of information in arthroscopy, knee surgery and orthopaedic sports medicine that will benefit each member, partner and patient. Funds provided to the Society through the Global Connection Campaign are critical to the success of this mission, and ISAKOS leadership is extremely appreciative of the generous support of industry and member support to date.

WWW.ISAKOS.COM/CAMPAIGN

THE TRIPLE DISASTER IN JAPAN

EARTHQUAKE, TSUNAMI, AND NUCLEAR ACCIDENT

Eiji Itoi, MD, PhD
Professor and Chair
Department of Orthopaedic Surgery
Tohoku University School of Medicine
Sendai, Japan

AT THE TIME OF EARTHQUAKE

The north-eastern part of Japan was struck by a M9.0 earthquake followed by a gigantic tsunami on March 11, 2011. I was in my office, when the earthquake occurred at 2:46 pm on Friday afternoon. Thirty-three years ago, I experienced a similar huge earthquake (M7.4 Miyagi Offshore Earthquake) here in Sendai when I was a medical student. This one was far bigger and stronger than the previous one. I was clinging to the desk, trying not to slip out of my chair, until the earthquake stopped. It lasted for 2 or 3 minutes, but I felt it was very long. While I was holding the desk, I realized that the books were coming out of the bookshelves, the desk top computer slowly fell, and the plants fell as if I was watching a slow motion movie. My office was located on the 11th floor of a 12-story building. This building was built more than 40 years ago, and accordingly it has not cleared the earthquake resistance standards. After the quake stopped, we quickly checked the rooms on the 11th floor. Everything in the room fell on top of each other (Fig. 1). It looked as if a suicide bomber had just blown up. Immediately, the electricity shut down. We walked down the stairs to the ground level and went to the orthopaedic ward, which was located on the 11th floor of the new hospital building. This building had a base-isolated, quake-absorbing system, and as a result, no damage was recognized. I was astonished by this difference. None of the hospitalized patients or the staff members was injured.

Fig. 1 Bookshelves fell and everything was scattered in our department office.

HEADQUARTERS FOR EMERGENCY DISASTER CONTROL

Immediately after the earthquake, our Hospital established headquarters for emergency disaster control with the hospital president, Prof. Satomi as the director general of the headquarters. Triage was performed by the staffers of the emergency center. We orthopaedic doctors were requested to take care of those with Red and Yellow tags. To our surprise, not so many patients came to the emergency room on that day. This was due to the fact that 90% of the casualties were by the tsunami: those who survived and those who did not were clearly separated. In addition, electric shut down, traffic jam, and disconnected phones made it even more difficult for the injured to come to the emergency room. We had the greatest number of emergency patients on the third day after the earthquake, which gradually decreased afterwards. We also need to dispatch our medical teams to our affiliated hospitals, some of which were located in the severely destroyed areas by the tsunami (Fig. 2). For the first couple of days, we were unable to obtain any information regarding the hospitals in the tsunami-destroyed areas due to electric shutdown and disconnected phones. On the third day, we started to receive some information from them, and we started to dispatch our medical teams, which lasted for about a month.

Fig. 2 Everything on the 1st floor to the 4th floor was destroyed by the tsunami. Only those on the 5th floor survived.

NUCLEAR POWER ACCIDENT

To make it worse, the tsunami destroyed the facilities of Fukushima Daiichi nuclear power plant. The cooling system of the nuclear reactors was destroyed in all four of them. As a result, the reactors melted down and hydrogen explosions destroyed the buildings of reactors. This caused releases of radioactive materials into the air and water. People within 20 km of the plant were subject to compulsory evacuation, whereas those between 20 km and 30 km were subject to voluntary evacuation. The agricultural and marine products in this area were banned for sale. The Tokyo Electric Power Company is trying to cool down the nuclear reactors, but they are still out of control.

DAMAGES CAUSED BY THE TRIPLE DISASTER

The epicenter was about 130 km east of Sendai, the capital of Miyagi prefecture. Following the earthquake came the huge tsunami, which struck and destroyed the Pacific coast for 500 km extending from Aomori prefecture to Chiba prefecture. The most severely damaged areas were Miyagi, Iwate, and Fukushima prefectures. As of May 26, 2011, the death toll reached 15,217 dead, with 8,666 missing. Maximum 440,000 were in temporary shelters like school gymnasiums after the earthquake, which is gradually decreasing to 103,021. Almost 60,000 houses were totally destroyed, and more than 160,000 houses were partially destroyed.

AIDS AND SUPPORTS

Next day of earthquake, disaster medical assistance teams (DMATs) from around the country were dispatched to the hospitals in destroyed areas. In addition, medical and assistance teams from Self Defense Force, Red Cross, and other hospitals came. Not only from inside the country, but also aids from all around the world came in various forms. The Israeli medical team of about 60 members came to Minamisanriku-cho, one of the most devastated towns. They started to work on March 27 and took care of about 200 patients during their 2-week stay. They brought x-ray machine and medical equipment. They donated all of them to the town and left. Two days after the earthquake, the aircraft carrier USS Ronald Reagan arrived off the coast of Japan to help Self Defense Force to refueling the helicopters and transporting troops. This is called US "Operation Tomodachi (which means friends in Japanese)". They helped clearing the debris from Sendai Airport and other destroyed areas. The Russian team (160 members) came to rescue people, but most of the people were killed by the tsunami, and they could not find any survivors. They recovered about 100 bodies. The Turkish rescue team (32 members) worked for 3 weeks, recovering the bodies, and helping the evacuees to find precious items such as photo albums. On April 11, one month from the disaster, Japanese government issued a statement in major newspapers in the world, saying "thank you for the Kizuna (bondage)". I would like to use this opportunity to express our heartfelt appreciation to all the members of ISAKOS for their support.

RECOVERY PHASE

Recovery started slowly but steadily. Temporary houses are constructed on the hills nearby. According to the officials, all those who live in evacuation shelters will be able to move to these temporary houses by the end of August this year. Rebuilding cities and towns is a difficult issue because the destroyed areas are low-lying and the existing seawalls have been proven to be useless against tsunami as huge as this one. They are planning to move the residential, business, and commercial areas to the nearby hills. It is an ideal, but not realistic plan because the land is so limited. The highway along the coast line functioned very effectively to protect the tsunami from coming further inland. According to the plan of the local government, they will use this system in a flat area with a long coast line.

The hospitals and clinics in devastated areas are gradually starting their patient care using temporary constructions or rented rooms/buildings. A survey showed that there were 380 hospitals in Iwate, Miyagi, and Fukushima prefectures: 11 hospitals were totally destroyed and 289 hospitals were partially destroyed, damaged, or inundated. Only 20% were perfectly intact.

The contents of medical care shifted with time. For the first 2-3 weeks, the emergency care was provided mainly to those who injured by earthquake and tsunami. Then, the number of patients with chronic diseases increased due to the lack of medical drug supply. Also, the number of patients with infection (pneumonia, enteritis) increased as their stay in evacuation shelters became longer. Furthermore, post-traumatic stress disorder (PTSD) and other mental problems became obvious due to mental stress coming from the disaster itself, loss of their loved ones, and anxiety for the future. Mental care seems to be most needed among the evacuees at this stage.

FUTURE PERSPECTIVE

We never know how long it would take to rebuild the cities and towns, bring back the people and their lives. We just keep moving forward. The nuclear power plant accident truly shattered the nuclear safety myth that had prevailed in Japan. After this accident, Prime Minister Kan requested the Chubu Electric Power Company to shut down the nuclear reactors of Hamaoka nuclear power plant in Tokai area, which is estimated to be hit by a M8.0 or greater earthquake in the near future. Now, two thirds of nuclear reactors in Japan are out of service. We really need to think about our future energy production. This is not just for the Japanese, but for all the people in all the nations. Time has come to re-think about energy production and energy consumption. Our decision at this point would make all the difference whether or not we can survive on this globe in the future. It depends on each of us.

THE TRIPLE DISASTER IN JAPAN

On behalf of JOSKAS, I would like to express my heartfelt appreciation to ISAKOS members for their warm words directed to Japan and the Japanese in this crisis induced by the catastrophic earthquake, tsunami and nuclear plant problems. We Japanese recall an old saying that we are powerless to do anything in the face of a natural calamity. We board members discussed at great length whether the 3rd JOSKAS meeting should be held in Sapporo from 16th to 19th May 2011, especially since the nuclear crisis is not yet over. Prof. Yasuda, the congress president, made a wise decision to avoid all luxurious dinners and entertainment, thereby showing due consideration and respect to the people suffering from this disaster. The unused budget from this conference will then be donated to the fund for the re-establishment of the Tohoku area. In this way, the annual meeting can achieve a two-fold success. I sincerely hope that the day will come soon when we Japanese can say that we have completely overcome and recovered from this serious disaster. I also hope that some of the weak points of the Japanese system can be addressed, with support and advice from the ISAKOS member countries.

AAC China – Kazunori Yasuda, Bruce Reider, Gary Poehling and Masahiro Kurosaka

AAC China – Konsei Shino, Masahiro Kurosaka, Mitsuo Ochi, Freddie Fu, and Bruce Reider

Mitsuo Ochi, MD, PhD
***President of* JOSKAS**
(*Japanese Orthopaedic Society of Knee, Arthroscopy and Sports Medicine*)
Hiroshima University, JAPAN

Japan experienced its largest ever earthquake, of magnitude 9, on the afternoon of 11 March 2011. The Great Eastern Japan Earthquake occurred under the sea off the north Pacific coast and then shattered the lives of thousands of people.

To date, 15,441 people have been confirmed dead, and an estimated 7,718 people are still missing.

(The National Police Agency's report) This disaster reminds us of just how fragile life could be.

It is clear that the full recovery of this tragedy will take many years and trillions of yen to overcome, but all the members of ISAKOS all over the world are teaching us that we, the Japanese surgeons, are not alone in this time of great trial and sorrow.

Across the Pacific, we are finding a hand of encouragement and support extended from all the nations. We, in fact, had JOSKAS meeting (Japanese version of ISAKOS congress) in Sapporo with Prof. Kazunori Yasuda as a congress president on June 16-18,

2011. Drs. Freddie Fu, Gary Poehling and Bruce Reider and many international guests came to attend this congress under the difficult circumstances to exchange information and encourage the younger surgeons.

We would like to take this opportunity to express our deepest gratitude to all ISAKOS members for your condolences and support..

***Masahiro Kurosaka*, MD, PhD**
***1st Vice President of* ISAKOS**
Kobe University, JAPAN

ISAKOS IN *Argentina*

Argentina is the second largest country in South America and the largest of the Spanish speaking countries. Despite its size, Argentina has a smaller population than other Spanish-speaking countries, such as Mexico, Spain or Colombia. This is due to the geographical diversity of Argentina – cities are very densely populated, while other areas have fewer than 1 person per 100 km^2. The total population is about 40 million people, with more than 50% residing in the state of Buenos Aires, and capital city of Buenos Aires.

Argentina is the eight largest country in the world, and has the 5th highest GDP(growth income per capita).

Argentina is 3.900 km long and 1400km wide on average. A country of extremes, Argentina is home to the highest American mountain – Cerro Aconcagua (Mendoza) at 6,902m; and the lowest point – Laguna del Carbon (Santa Cruz) at -114m. Argentina's landscape includes about 30,000 square kilometers of water surface, including lakes and rivers. Additionally, Argentina has nearly 3000 miles of coastline along the Atlantic Ocean.

Argentina possesses an incredible variability of landscapes ranging from the outstanding Iguazu Falls, Lake Argentine Blue Glaciers on the southern mountains, the increasing whale and penguins colonies in Puerto Madryin, the beautiful colors of the Seven Colors Mountains in Salta. Early settlers included indigenous settlers in the Patagonia area in the south of Argentina, as well as Incas and Diaguitas in the North.

The Argentine Arthroscopy Association was founded in 1987, and hosts an annual meeting each year. The annual meeting was held in 2011, and included more than 1200 participants, due to collaboration with SLARD and AOSSM.

The Argentine Arthroscopy Association has more than 800 members, and holds annual specialization courses, as well as monthly meetings and reunions in each Argentinean state. Also since 1994, the AAA has published its own official Journal under the name ARTROSCOPIA in Spanish, available to members online or by print.

Argentinean surgeons were very involved in the early development of ISAKOS. In fact, the first real ISAKOS meeting after the union of the International Arthroscopy Association and the International Society of the Knee was held in Buenos Aires in 1997.

More than 58 members of ISAKOS come from Argentina, including 1 Emeritus member, and 5 active Committee Members. Argentina has four ISAKOS approved Teaching Centers, as well as various ISAOKS Approved Courses throughout the year. The Board of Directors of the Argentine Arthroscopy Association look forward to increasing bonds with ISAKOS to improve and increase membership and enjoy the exceptional educational capabilities of the ISAKOS association.

Prof. Dr. Daniel Slullitel
Rosario, Argentina
Director Jaime Slullitel Sports and Trauma Institute
Member of ISAKOS *Newsletter Editorial Board and Sports Medicine Committee*

Message from the 2011 ISAKOS Congress *Program Chair:*

Dear *Friends in* ISAKOS:

The 8th Biennial ISAKOS Congress, held in Rio de Janeiro, was the most successful to date! On behalf of the entire ISAKOS Program Committee, I would like to thank all the attendees and members of the ISAKOS community for their great contributions. Additional thanks are due to the local organizers in Brazil – this meeting would not have happened without their assistance.

The ISAKOS Congress had more than 4000 attendees – a new record! More than 83 countries were represented in a unique display of the international community that makes up ISAKOS.

Special thanks are due to the more than 800 presenters who participated in the electronic posters, scientific paper presentations, and as faculty members for the Congress, each Pre-Course, and the Sports Rehabilitation Concurrent Course. This was ISAKOS' most ambitious scientific program to date, and we were able to accomplish our goals, due in large part to these extraordinary faculty members!

ISAKOS would also like to acknowledge each abstract that was submitted for the 2011 Congress! More than 2000 abstracts were submitted, and only 800 were accepted for presentation, as either scientific paper or e-Poster presentations. This is a 40% acceptance rate – demonstrating the competitive nature of ISAKOS Congress abstract submission. This also demonstrates that the ISAKOS Congress is a highly respected and sought after meeting to attend and present at.

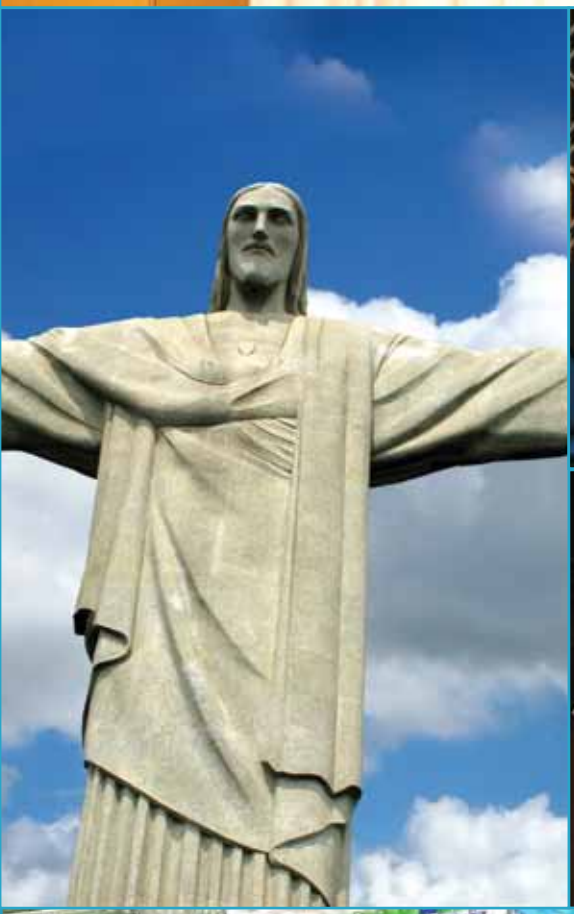
The Scientific Program began on Saturday, May 14 with three concurrent full day Pre-Courses including Olympic Games: From Basic Science to the Gold Medal, Biologic Treatment Options for the Knee, and Spotlight on Top Orthopaedic Procedures in Sports Medicine. These courses were attended by more than 600 surgeons! Special thanks to our pre-course chairs, Anthony Miniaci, Fredrik Almqvist, Moises Cohen, Benno Ejnisman, Guillermo Arce & Kevin Plancher.

ISAKOS was also pleased to offer for the first time in 2011, a Sports Rehabilitation Concurrent Course. This course, entitled Global Perspectived for the Physical Therapist and Athletic Trainer, was geared towards physicians, athletic trainers, physiotherapists, and coaches concerned with the management or prevention of injuries for the athlete. This course was very successful with more than 200 participants! Special thanks to chairs, Moises Cohen, Mauricio Garcia, James Irrgang and Lynn Synder-Mackler for their assistance in planning this very informational course.

The ISAKOS Program Committee strove to create a program with a variety of preventative, innovative and exciting topics, we are pleased to say we achieved our goal! We hope you enjoyed the 2011 ISAKOS Congress, and took new information home to use in your practice. We look forward to the next ISAKOS Congress and the next opportunity to engage in the worldwide exchange and dissemination of knowledge that ISAKOS is famous for.

***Andreas Imhoff*, MD**
Chair, 2011 ISAKOS Congress Program

ISAKOS 2011 CONGRESS UPDATE



ISAKOS *Congratulates Award & Fellowship Winners*

The International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine proudly presented the following awards at the 8th Biennial ISAKOS Congress held May 15–19, 2011 in Rio de Janeiro, Brazil.

JOHN J. JOYCE AWARD

Sponsored by Smith & Nephew

In 1981, Dr. John J. Joyce III offered a monetary prize for the best arthroscopy paper read during the Scientific Program of the 4th Congress of the International Arthroscopy Association in Rio de Janeiro. With characteristic generosity, he endowed a prize to be awarded at every IAA Congress thereafter. A committee comprised of members of the ISAKOS Arthroscopy Committee selects first and second place prize–winning papers from manuscripts presented at the ISAKOS Biennial Congress.

1st Place

"Vascular Safe Zones During Hip Arthroscopy"
Frank McCormick, MD, USA

2nd Place

"The lateral tibial tunnel in revision anterior cruciate ligament surgery. A biomechanical study of a new technique."
Hans Van Der Bracht, MD, BELGIUM

RICHARD B. CASPARI AWARD

Sponsored by DePuy Mitek

Beginning at the 2003 ISAKOS Congress in Auckland, New Zealand, a monetary prize in honor of Richard B. Caspari was awarded to the best upper extremity paper read at the scientific program of the congress. A panel composed of members of the ISAKOS Upper Extremity Committee selects the prize-winning paper read at the ISAKOS Biennial Congress.

1st Place

"Stress Distribution Inside The Bone After Suture Anchor Insertion – A Simulation Study Using Three-Dimensional Finite Element Method"
Hirotaka Sano, MD, PhD, JAPAN

2nd Place

"Matrix Metalloproteinase, Tissue Inhibitor of Metalloproteinase and Transforming Growth Factor-beta in Frozen Shoulder, and Their Changes as Response to Active Stretching and Gentle Thawing Exercise"
Andri Lubis, MD, PhD, INDONESIA

SCIENTIFIC AWARD

Beginning at the 2007 ISAKOS Congress in Florence, Italy, a monetary prize was awarded to the best scientific paper presented during the scientific program of the congress. A panel composed of members of the ISAKOS Scientific Committee selects the prize-winning paper papers from manuscripts presented at the ISAKOS Biennial Congress.

1st Place

"Screening For Femoroacetabular Impingement In Asymptomatic Adolescent Athletes"
Bruce Levy, MD, USA

2nd Place

"Platelet Rich Plasma (PRP) in Arthroscopic Rotator Cuff Repair. A Prospective RCT Study, 2 years Follow-up"
Pietro Randelli, MD, ITALY

ALBERT TRILLAT YOUNG INVESTIGATOR'S AWARD

Sponsored by Stryker

Established in memory of Professor Albert Trillat, past president and founder of the International Society of the Knee, this award provides recognition for a young researcher who has done outstanding clinical laboratory research contributing to the understanding, care or prevention of injuries to the knee. A panel composed of members of the ISAKOS Knee Committee reviews the award applications and the winning manuscript is presented at the ISAKOS Biennial Congress.

2011 WINNER

"Double Bundle Versus Single Bundle Anterior Cruciate Reconstruction – Is the Double Bundle Technique Really Better?"
Timothy Whitehead, MD, AUSTRALIA

8TH BIENNIAL ISAKOS 2011 RIO DE JANEIRO • BRAZIL • MAY 15–19, 2011 CONGRESS

ACHILLES ORTHOPAEDIC SPORTS MEDICINE RESEARCH AWARD

Sponsored by DJO Global

This ISAKOS award recognizes researchers who have done outstanding clinical or laboratory research in the field of sports medicine, such as the care and prevention of injuries. A panel composed of members of the ISAKOS Orthopaedic Sports Medicine Committee reviews the award applications and the winning manuscript is presented at the ISAKOS Biennial Congress.

2011 WINNER

"Correlation of Clinical and MRI Findings in Professional Dancers' Hip: A New Femoro-Acetabular Impingement?"
Victoria B. Duthon, MD, SWITZERLAND

THE PATELLOFEMORAL RESEARCH EXCELLENCE AWARD

Sponsored by *The Patellofemoral Foundation, Inc.*

The Patellofemoral Research Excellence Award was established in 2003 to encourage outstanding research leading to improved understanding, prevention and treatment of patellofemoral pain or instability. A panel composed of representatives from the ISAKOS Knee and Scientific Committees, The International PF Study Group and The Patellofemoral Foundation review the award applications and the winning manuscript is presented at the ISAKOS Biennial Congress.

2011 WINNER

"The Geometry and Function of the Patellofemoral Joint"
Farhad Iranpour, MD, UNITED KINGDOM

NICOLA'S FOUNDATION YOUNG RESEARCHER AWARD

Sponsored by the *Nicola Foundation*

This ISAKOS award recognizes young researchers who have done outstanding work in arthroscopy, knee surgery or orthopaedic sports medicine.

2011 WINNER

"Twenty-Six Years of Meniscal Allograft Transplantation (MAT): Is It Still Experimental? Meta-Analysis of 44 Trials"
Mohamed El Attar, MD, EGYPT

THE PATELLOFEMORAL TRAVELING FELLOWSHIP

Sponsored by the *Patellofemoral Foundation, Inc.* and DJO *Global*

This travel award was developed to promote better understanding and communication regarding atellofemoral pain. This opportunity is awarded on a competitive basis to an orthopaedic surgeon interested in the study and advancement of understanding of the patellofemoral joint. Preference will be given to those who have established an academic record of accomplishment. The Patellofemoral Foundation will provide a stipend to permit visits to several centers, worldwide, that offer opportunities to learn about the complexities of patellofemoral pain. The fellows will write a report of the experience, which will be considered for publication in *Arthroscopy: The Journal of Arthroscopic and Related Surgery*.

2011 Fellow - Ashraf Abdelkafy, MD, EGYPT

2012 Fellow - Geraldo Luiz Schuck De Freitas, MD, BRAZIL

THE UPPER EXTREMITY TRAVELING FELLOWSHIP

This fellowship was developed to promote better understanding and communication regarding injuries or conditions involving the structures of the Upper Extremity. This opportunity will be available on a competitive basis to an orthopaedic surgeon between the ages of 35 and 45 years, interested in the study and advancement of understanding of injuries to the Upper Extremity. Preference will be given to those who have established an academic record of accomplishment. A stipend will be provide to permit visits to several centers, worldwide, that can match their facilities with the applicant's interest. The fellow will write a report of the experience which will be considered for publication in *Arthroscopy: The Journal of Arthroscopic and Related Surgery*.

2011 Fellow - Mohamed Shafi, MD, INDIA

2012 Fellow - Sedeek Mohamed Mosaid, FRCS, SINGAPORE

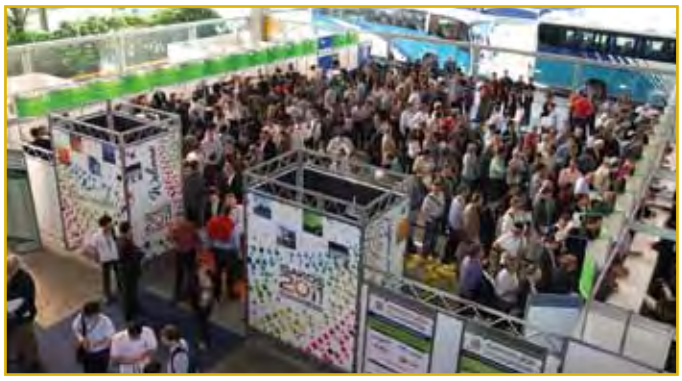
ISAKOS 2011 CONGRESS UPDATE

WELCOME RECEPTION

ISAKOS thanks all who participated in the 2011 ISAKOS Congress Welcome Reception. Congress participants and their guests enjoyed a performance by a symphony and youth choir, as well as a Flash Mob, and caipirinhas.

REGISTRATION

More than 4000 people attended the 2011 ISAKOS Congress.



8TH BIENNIAL

ISAKOS 2011 CONGRESS

RIO DE JANEIRO • BRAZIL • MAY 15–19, 2011

SURGICAL DEMONSTRATIONS

ISAKOS welcomed the presidents of many international societies for breakfast on Monday, May 16th.

EPOSTERS

More than 550 Electronic Posters were presented as part of the 2011 ISAKOS Congress Scientific Program. The Top 10 E-Posters were selected by the Program Committee, and presented on a video screen at the E-Poster viewing stations. For a complete list of the E-Poster Top 10, and to view their posters, please visit www.isakos.com.

INTERNATIONAL PRESIDENTS BREAKFAST

ISAKOS welcomed the presidents of many international societies for breakfast on Monday, May 16th.

ISAKOS BOOTH

9TH BIENNIAL

ISAKOS CONGRESS 2013

MAY 12–16, 2013 • TORONTO, CANADA

Call for Abstracts

ONLINE ABSTRACT SUBMISSION

The International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS) is pleased to announce the Call for Abstracts for the 2013 Congress.

To submit an abstract, visit the 2013 ISAKOS Congress website www.isakos.com/2013congress.





Submit Online at www.isakos.com/2013congress

Abstract Submission Deadline: September 1, 2012

ISAKOS is pleased to announce our 9th Biennial Congress, to be held in Toronto, Ontario, Canada on May 12–16, 2013! The Biennial Congress is a cornerstone of ISAKOS' mission to "advance the worldwide exchange and dissemination of education, research and patient care in arthroscopy, knee surgery and orthopaedic sports medicine". The Biennial Congress provides a unique opportunity for an international dialogue with renowned experts.

The ISAKOS Congress is well known in the international community for the unique opportunities it presents to network and discuss ideas with experts from around the world on a variety of specialties. The 2013 ISAKOS Congress is anticipated to bring more than 4000 orthopaedic surgeons, allied health personnel, residents, fellows and physical therapists to Toronto.

The ISAKOS Program Committee is currently hard at work developing an exciting program to emphasize evidence based medicine, new surgical developments and basic science. The ISAKOS Congress includes instructional course lectures, live surgical demonstrations, symposia, debates, lectures, scientific paper presentations, electronic posters, and lunch time lecture and workshop sessions. A diverse multi-disciplinary faculty will present technical pearls and pitfalls, new and emerging research, and exciting trends.

The city of Toronto is an ideal location for the ISAKOS Congress. Known for its international perspective, Toronto has one of the largest non-native populations of any city in the world, with nearly 49% of occupants born outside of Canada. Toronto is consistently voted to be one of the "most livable cities," including a thriving arts scene with more than fifty ballet and dance companies, six opera companies, two symphony orchestras and a host of theatre companies.Congress attendees are invited to visit local landmarks such as Toronto's most prominent landmark, the CN Tower; the Royal Ontario Museum, the Toronto Zoo, the Art Gallery of Ontario, the Ontario Science Centre, and the Hockey Hall of Fame. Congress attendees will also visit the city in time to catch a game with the Toronto Blue Jays, who play for the American League of Major League Baseball.

You are a vital part of the 9th Biennial ISAKOS Congress!
We encourage you to submit your abstracts, and be a part of the 2013 Congress! Abstract Submission is now open and will be available until September 1, 2012. We hope you will plan to participate in the international excitement and experience that is the ISAKOS Congress. We look forward to seeing you in Toronto!

Moises Cohen, MD, PhD
ISAKOS President, 2011– 2013

Marc Safran, MD
2013 ISAKOS Program Chair

Apply Online for 2013 CONGRESS AWARDS & FELLOWSHIPS

John Joyce Award

Richard B. Caspari Award

Scientific Award

Achilles Orthopaedic Sports Medicine Research Award

Albert Trillat Young Investigator's Award

Patellofemoral Research Excellence Award

Nicola's Foundation Young Researcher Award

The Upper Extremity Traveling Fellowship

The Patellofemoral Traveling Fellowship

DEPARTMENT OF ORTHOPAEDIC SPORTS MEDICINE

Hospital Rechts der Isar
University of Munich, Munich, Germany



The Department of Orthopaedic Sports Medicine originated from the Olympic Summer Games 1972 in Munich, and includes 2 separate centers. The department is headed by Prof. Andreas Imhoff since 1996. The location of the first center is our outpatient clinic within the Olympic Campus at the Sports Faculty of the Technical University of Munich. The second center includes 2 operating theaters and 2 clinical wards at the university hospital Klinikum rechts der Isar of the Technical University of Munich. A modern physiotherapy facility is affiliated at both locations for early and accelerated ambulant as well as stationary physical rehabilitation. A specialty of our department is focused on the care of high professional athletes as well as on patients performing recreational sports. This includes both the operative and conservative treatment regimes together with prevention and rehabilitation programs.

The following sports organizations and institutions were supported by our medical service:
The national alpine ski team of the German Ski Association (DSV) The national snowboard team of the German Ski Association (DSV)Several other German national team players and high performance athletes (e.g. biathlon, soccer, basketball, moto cross, boxing)

Treatment options in our department
Our clinical team includes 5 consultants, 12 physicians, 1 sports scientist, and 6 physical therapists. The Department of Sports Medicine is an autonomic part of the Department of Orthopedics and Trauma Surgery at the Klinikum rechts der Isar.

Diagnostic and therapeutic portfolio
Our clinical diagnostic and treatment regimes as well as our rehabilitation programs are based on the newest achievements in medical research of orthopaedics and sports medicine. In close cooperation with the Department of Radiology at the Klinikum rechts der Isar, we are able to perform the most modern methods of imaging. This includes magnetic resonance imaging (3 Tesla) and high resolution arthro-CT scans for diagnosis of e.g. shoulder, knee and ankle injuries. In addition, functional imaging (e.g. PET-CT scans) is available for special clinical questions.

Minimal-invasive surgical treatment of acute injuries of the musculoskeletal system and the treatment of degenerative lesions of large joints are the main focus of our department, especially in the knee, shoulder, ankle, and elbow joint. Predominantly advanced arthroscopic techniques are performed.

These approaches preserve an intact joint capsule and maintain proprioceptive function. As a consequence, postoperative rehabilitation can be accelerated and hospital stay can be reduced. Specifically, ruptures of the anterior and posterior cruciate ligament, meniscal and cartilage lesions are treated arthroscopically. Mostly, cruciate ligaments are reconstructed in double bundle techniques. The fixation is usually performed with bioabsorbable screws in an aperture technique.

Shoulder dislocations with lesions of the capsuloligamentous complex are arthroscopically reconstructed with bioabsorbable suture anchor systems. In rotator cuff tears, the arthroscopic single- and double-row reconstruction techniques represent the golden standard in our department. Furthermore, novel arthroscopically-assisted reconstruction techniques of the acromioclavicular joint in acute and chronic cases were developed in our department.

Another main area are treatment strategies for cartilage lesions especially to address the high demands of active patients to restorate their sports ability. For this purpose, all validated cartilage therapies are available (microfracture, autologous chondrocyte transplantation and osteochondral transplantation). In particular, the transplantation of autologous osteochondral cylinders (e.g. OATS or Mega-OATS) is performed at our department since 1996 and more than 1000 operations on the knee, ankle, elbow, and shoulder were performed.

Another treatment option for malalignment and consecutive single compartment osteoarthritis of the knee joint are osteotomies. Depending on the underlying pathology (varus/valgus malalignment, instability, meniscal loss), the osteotomy is performed at the site of the deformity. Combined malalignment, ligamentous, and meniscal lesions represent one of our surgical expertise areas with single-staged addressing of all pathologies. In cases of severe localized or general joint destruction, partial or total joint replacements are part of our surgical portfolio. This includes partial endoprostheses (unicaps, unicompartimental prothesis, femoropatellar prothesis) and total joint replacement at the knee. Corresponding options are available for the shoulder (anatomical, inverse, fracture), and the ankle joint. Finally, relevant soft tissue injuries of the musculoskeletal system like tendon and complete muscle ruptures are treated surgically with suture anchor refixation techniques.

Research:
In our molecular and biomechanical laboratories, various fields in sports medicine research are attended. Especially new techniques for cartilage restoration like gentherapeutic approaches with growth factors and iron marking of chondrocytes for MR-imaging are studied. In addition, the influence of stem cells on cartilage and tendon repair is evaluated. Another topic is the analysis oft the regional bone bood flow under certain circumstances like local cooling and after blood arrest. Novel techniques and implants for orthopaedic sports and trauma surgery like specialized suture anchors are tested. In addition, motion analysis of high performance junior elite javelin throwers and volleyball players with special respect to early structural and clinical changes were evaluated. Many of these projects are supported by different grants of research and other scientific institutions like the German Research Foundation (DFG), the European Union (EU), the AO Foundation, the German Osteoarthritis Help, the German-Speaking Arthroscopy Association (AGA), the German Institute for Sport Sciences (BISp), and others. Several publications of our department are published in renowned peer-reviewed journals.

Full article and references also available online at www.isakos.com.

"FEMORAL SOCKET FIRST": A Technique for Improved Visualization in ACL Reconstruction

Iftach Hetsroni, MD*

Frank A. Cordasco, MD**

Robert G. Marx, MD, M.Sc., F.R.C.S.C.**

* *Department of Orthopedic Surgery, Meir General Hospital, Sapir Medical Center, Tsharnichovski street 59, Kfar Saba 44281, Israel, and Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel.*

** *Hospital for Special Surgery, Weill Medical College of Cornell University, 535 East, 70th street, New York, New York 10021, USA*

Abstract

The two most commonly used methods for femoral tunnel preparation during ACL reconstruction are the independent anteromedial and transtibial techniques. For the transtibial technique, the tibial tunnel must be reamed before the femoral socket. Therefore, many surgeons, when adopting the independent anteromedial technique, still ream the tibial tunnel first as a matter of habit. However, with the independent anteromedial portal technique, this is not obligatory. In this brief communication we describe our technique that prepares the femoral socket before reaming the tibial tunnel. Advantages of this tunnel preparation sequence include better visualization during femoral socket preparation as fluid leak is reduced. In addition, adopting this tunnel preparation sequence can be helpful as a transition during the learning curve in becoming familiar with an "all-inside" approach.

Introduction

The preferred method for femoral socket preparation during a single bundle ACL reconstruction is controversial in the orthopedic literature. The two most commonly used methods are the independent anteromedial and transtibial techniques. The major advantage of the anteromedial technique is related to greater ease with anatomical graft positioning on the femoral side. On the other hand, a steep learning curve and a few potential technical challenges with this method could make it less desirable for some surgeons.

For the transtibial technique, the tibial tunnel must be reamed before the femoral socket. Therefore, when we adopted the independent anteromedial technique, we were still reaming the tibial tunnel first as a matter of habit. However, we realized that with the independent anteromedial portal technique, this is not obligatory and in fact we subsequently modified the sequence of tunnel reaming. We now prefer to ream the femoral socket first. To our knowledge, there is no report in the literature that discusses femoral socket preparation prior to tibial tunnel preparation. In this note we present this method and discuss the advantage.

Technique description

After all other intra-articular pathologies are addressed the ACL footprint on the femur is identified. At this point, the use of a 70 degree arthroscope can facilitate the evaluation of the femoral footprint from the anterolateral portal. The femoral socket is then reamed over a guide pin through an accessory anteromedial portal (Figure 1). When the femoral socket is ready, the ACL footprint on the tibia is still intact (Figure 2). The tibial tunnel is then reamed over a guide pin. The ACL graft is finally fixed on the femur and on the tibia (Figure 3).

Figure 1: *Reaming a 10mm wide femoral socket through an accessory anteromedial portal (30 degrees scope view through an anterolateral portal).*

Figure 2: *Femoral socket with intact tibial ACL footprint (30 degrees scope view through an anteromedial portal).*

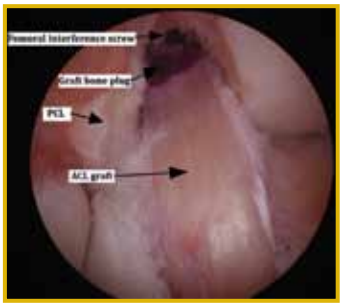


Figure 3: *Reconstructed bone-patellar tendon-bone ACL autograft (30 degrees scope view through an anteromedial portal).*

Discussion

Fluid management during ACL reconstruction is crucial since fluid egress can lead to poor visualization and technical difficulties. By reaming the femoral socket first, we have found an advantage in that fluid leak from the knee is minimized which substantially improves visualization during femoral socket creation. In addition, the surgeon can save time by deleting the step of trying to determine whether the femoral socket can be reached via the transtibial approach. And finally, surgeons may use the technique described as a transition during the learning curve in becoming familiar with an "all-inside" approach.

Full article and references also available online at www.isakos.com.

THE USE OF NAVIGATION IN ACL RECONSTRUCTION: *An Overview*

David A Parker, FRACS
Knee Committee

The use of computer navigation in knee surgery has had a significant increase in popularity since its original inception over 10 years ago, particularly in the area of arthroplasty, and more recently in ligament reconstruction and periarticular osteotomy. Although knee arthroplasty has overall been a very successful intervention, inadequacies remain, and up to 25% have non-ideal alignment despite significant improvements in conventional instrumentation. In addition, outcomes are usually significantly improved postoperatively, but still remain below age-matched controls. Therefore, there exists an ongoing need to improve the techniques involved in knee surgery, and computer navigation appears to provide a potential significant advance that may lead to such improvement. The previous ISAKOS meeting in Osaka in 2009 included a comprehensive precourse detailing the latest advances and opinions from a number of experts in this area, and the last issue of the ISAKOS newsletter summarized the proceedings relevant to ligament reconstruction. In this article, the proceedings of this precourse relevant to knee arthroplasty and osteotomy will be addressed, supplemented by more recent literature.

Initial computer navigation systems were largely image-based, usually requiring CT scans preoperatively, which had the disadvantages of increased preparation time, cost and radiation exposure for the patient. Over the last 10 years systems have become predominately image-free, that is, not requiring preoperative imaging. Systems usually require pins to be inserted into femur and tibia, to give fixed points of reference for the navigation system, and infrared trackers are then attached to these. The trackers can either be passive (reflective) trackers, or active trackers that generate an infrared signal directly. The infrared signal is captured by an infrared camera, allowing data acquisition relevant to the centres of hip, knee, and ankle to generate mechanical alignment, and features of local anatomy of the knee to assist with implant sizing and positioning. Mapping of the surface contours of the knee allows the computer to create, or "morph", a virtual image of the knee to do this planning. Electromagnetic trackers have been trialled in order to eliminate line of sight issues that occur with infrared systems, but have largely been abandoned now due to difficulties with interference from ferrous ions in the surgical instruments, such that virtually all systems now use infrared technology.

Hardware required for navigation includes the computer itself and the attached infrared camera (Figure 1). Bone pins are usually 3-4 mm diameter and are secured to femur and tibia, after which clamps are attached to these pins and then to the trackers, providing secure bony fixation. A navigated pointer is required for registering bony landmarks, and specific navigated instruments include cutting blocks, implant positioning blocks, introducers, and instruments to check alignment of the prosthesis after implantation. Specific navigated instruments allow reduction of the need for many conventional instruments, thereby allowing decreased inventory.

Figure 1. *Operating Room setup for Primary TKR showing navigation system computer and infrared camera.*

Figure 2. *Computer screenshot showing software used for femoral component positioning intraoperatively.*

There exists now a comprehensive series of published studies, many level 1 evidence, in addition to papers presented at the ISAKOS precourse demonstrating the advantage of navigation over conventional instrumentation in improving accuracy and reducing "outliers". In addition to improving the alignment of tibial and femoral components, navigation has additional potential benefits in assessing ligament balancing and motion intraoperatively, and collection of data recording these parameters will allow closer correlation with postoperative outcomes, hopefully serving as a tool to better assess the relationship between implant positioning and outcomes and thereby improve results for patients. An interesting in vitro study presented by Amis et al at the ISAKOS precourse demonstrated the potential benefits of correlating prosthetic alignment to resultant knee kinematics, both measured using navigation, in guiding surgical technique to improve functional outcomes. Another study presented by Neyret et al demonstrated the ability of navigation to assist with soft tissue balancing, with potential benefits in improved functional outcomes. Indeed, recently published studies are demonstrating functional improvements in TKR with navigation versus conventional instrumentation. Significantly longer followup is obviously required before we will know whether or not improved alignment leads to improved survival in the long term. Many systems also have software that assists with implant sizing and positioning (Figure 2), which in addition to optimizing these aspects of the surgery, may serve to decrease operative time and inventory. The value of navigation, and the feedback it can provide, as an educational and research tool is also a potentially significant source of advances in TKA surgical technique and design.

Although navigation is not at this stage used universally for primary TKR, there are some clear indications which are generally agreed on, such as extraarticular deformity or ipsilateral THR, in which conventional instrumentation usage is compromised. The routine use of navigation for primary TKR seems to be on the increase, although this is somewhat region dependent.

A survey of ISAKOS members in 2008 regarding usage of navigation was compromised somewhat by a low response rate, but found that almost 50% of respondents used navigation for less than 25% of TKR cases, and 30% used it for more than 75% of cases. Usage would appear to vary greatly between countries, based at least in part to accessibility.

Navigation can also be used in unicompartmental knee replacement. Indeed, it is well established that alignment is critical to the outcome and longer term survival of these implants, making navigation an attractive instrument for these procedures. Particularly when these surgeries, and more often TKR also, are being done via a "minimally invasive" approach, reduced visualization is less likely to result in poor alignment with the assistance of a navigation system to accurately assess alignment. Although specific software is not yet available for revision knee replacement, use of primary TKR software is also proving beneficial in this scenario for optimizing alignment and balancing. Indeed, in the revision scenario, with less anatomical landmarks available for standard techniques, there would seem to be a clear benefit of navigation, although further development of specific software is probably required to realize this benefit.

Figure 3: *Operative room setup for opening wedge* HTO, *showing medial incision, trackers in femur and tibia, navigation system, and fluoroscope.*

Periarticular osteotomy about the knee joint is also becoming a clear indication for the use of computer navigation (Figures 3–5). When performing this surgery for indications including osteoarthritis and instability, achieving the correct alignment is critical to the outcome. Traditional methods include preoperative or intraoperative imaging, and navigation has been shown to provide at least equivalent accuracy to these techniques, with a number of potential advantages. In opening wedge osteotomy in particular, a gradual correction can be monitored in real time, and less radiation is required. Monitoring range of motion, particularly extension, can also give an indirect measure of the procedure on tibial slope, and avoid postoperative flexion contractures. In addition, navigation allows assessment of alignment throughout the range of motion, something that cannot be done accurately with plain films, which are universally done in full extension. Assessing alignment inflexion is particularly relevant to cases of more posterior wear, especially in lateral compartment arthrosis, where malalignment may not be evident in full extension.

Figure 4: *Operative Room setup for Distal Femoral Opening wedge osteotomy, showing lateral incision, trackers, navigation system and fluoroscope.*

Navigation can be used for both proximal tibial and distal femoral osteotomy, requiring the same hardware and somewhat simpler software than is normally used for TKR, and should hopefully lead to more consistent and reliable results.

There remain some negative issues with the use of computer navigation and areas that are yet to be resolved. Increased operating time, increased cost, pin complications, line of sight issues with trackers, and computer malfunction are all potential issues that may compromise the surgery or lead to a reluctance to adopt the technology. In reality, with increasing experience, operating time is comparable to conventional techniques, complications are becoming increasingly rare, and increased costs can be balanced by reduced inventory. One issue that remains unresolved is component rotation. Whilst navigation is proven to be more accurate in the coronal and sagittal planes, accuracy in the axial plane has mostly been equivalent to conventional techniques. This is not surprising, as navigation in this plane essentially involves storing rotational alignment registered by the surgeon and then feeding this back to the surgeon. This therefore still involves potential inaccuracies involved in surgeons identifying epicondyles and AP axes.

Figure 5: *Pre and Post Correction screenshots for Distal Femoral Osteotomy for lateral OA, demonstrating correction achieved from valgus malalignment to varus.*

THE USE OF NAVIGATION IN ACL RECONSTRUCTION: *An Overview* (cont.)

An image based system would be more likely to improve this, but would require additional preoperative imaging. One newer technology that may address this is the use of "shapefitting blocks" (Figure 6) which are customized cutting blocks developed from preoperative imaging of a patient's knee, either with CT or more commonly MRI scans. Disposable blocks are then produced for tibia and femur, with slots for distal femoral and proximal tibial cuts. Drill holes are also provided for sizing and positioning the femoral cutting block based on the patient's anatomy. This imaged based technology has the potential to improve rotational alignment and sizing over image free technology, although some preliminary studies would suggest that coronal and sagittal alignment may not be as reliable as standard navigation. This promising technology therefore requires further careful evaluation.

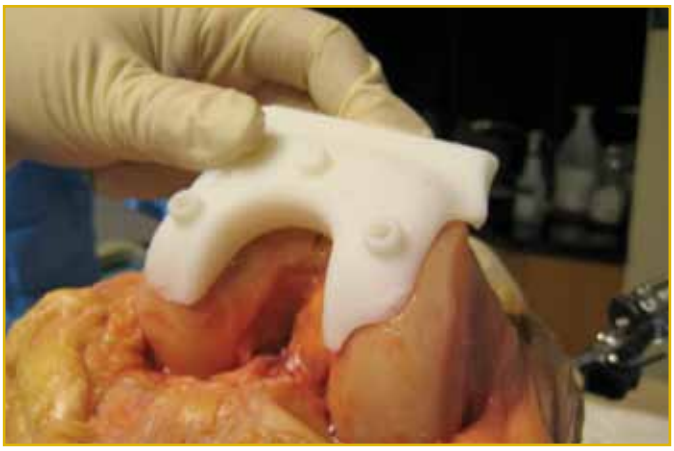


Figure 6: *Example of Shapefitting block for Femoral Component in* TKR.

Overall the advantages of computer navigation would appear to greatly outweigh any residual disadvantages, many of which would appear to have at least ongoing improvements if not resolutions. Computer navigation in orthopaedic surgery is still relatively new and continuing to evolve, and further advances are expected to improve the efficiency, accuracy and accessibility of these techniques. There would appear to be sufficient evidence now to recommend its use in knee arthroplasty and osteotomy, with some clear advantages over conventional techniques, although further study is obviously required to demonstrate that the improved alignment and balancing achieved do translate to improved functional outcomes, patient satisfaction, and ultimately implant survival and reduced rates of revision.

Full article and references also available online at www.isakos.com.

HOW TO MANAGE THE FIRST TIME ANTERIOR SHOULDER DISLOCATION?

Steven B. Cohen, MD

The glenohumeral articulation is the most mobile joint in the body and as such is most prone to dislocation, particularly anteriorly. There is much debate and controversy regarding the management of the first time shoulder dislocation. The incidence age of dislocation is bimodal with peaks in the second and sixth decade. There is less controversy regarding treatment of the first time dislocator over the age of 50, since the incidence of recurrent instability is low. The most important factor to assess in this case is the integrity of the rotator cuff, as tears are much higher in this population.

It is the younger population who is at much higher risk of recurrence (50–90%) after an anterior dislocation where controversy exists over the initial treatment. Most, if not all, clinicians would agree that following a first time shoulder dislocation, a short period of immobilization is recommended. However the position of immobilization is debatable as Itoi et al initially showed that recurrence rates were reduced with the arm immobilized in external rotation. Several subsequent studies on the other hand including a recent publication in JBJS have not found recurrence rates to be reduced whether the arm was positioned in internal or external rotation. In addition, the compliance rate with immobilization in external rotation has been shown to be relatively low. As a result, the initial treatment typically consists of 2 to 4 weeks of immobilization (regardless of arm position) to allow the initial pain to subside followed by a formal therapy program to begin range of motion and strengthening exercises.

Radiographic examination includes plain x-rays to confirm the shoulder has been reduced as well as assessment of bony lesions of the humeral head (Hill-Sach's lesion) and glenoid (bony Bankart or bone loss). If there is evidence of bony abnormalities, a CT scan can be useful to help determine the extent of injury. More commonly however, MRI enhanced with gadolinium arthrogram is used to evaluate for labral pathology, in particular an anteroinferior labral tear, and any other associated pathology.

The recommendation regarding treatment depends on many factors. As stated above, age is a critical factor, but activity level and pathology are equally as important. For a young athlete, the timing of the injury during a season may be one of the most significant factors. A contact athlete who sustains a dislocation early in the season may be able to rehabilitate quickly enough to return to participation in the same season with a protective harness as long as they are willing to assume the risk of another injury. While the same athlete with an injury at the end of the season, may consider surgical stabilization following completion of the season, to allow a more confident return to sports for the next season.

The pathologic injury sustained during the initial dislocation is also another key factor. Any type of significant bony injury to the glenoid or humeral head increases the risk of recurrent dislocation, thus those patients should strongly consider surgical treatment. Conversely, a patient without clinical apprehension and no evidence of labral pathology on MRI arthrogram may be encouraged toward initial nonoperative treatment.

Ultimately however, following a traumatic anterior dislocation, a number of studies have shown that recurrent instability rates to be as high as 90%. This has led to a number of studies evaluating surgical management of the first time dislocator, most commonly in the military population. These studies found a re-dislocation rate of 14–22% in these active patients following surgical stabilization compared to 80–92% recurrence with nonoperative treatment. This disparity highlights the benefit of surgical treatment, particularly in this high demand population and can be applied to other contact athletes.

There are many factors to consider regarding the treatment of the patient with a first time shoulder dislocation. Some of the key things to consider are: age of the patient, activity level, and the pathology incurred from the dislocation. The patient and patient's family especially in the younger age group should be informed of the risks associated with either treatment. This allows each individual patient to make the most appropriate decision for treatment of their shoulder.

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CLINICAL APPLICATION OF PLATELET RICH PLASMA – *The way we see it!*

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Growth Factors play complex regulatory role in maintaining tissue structure and in tissue repair. Growth factors influence many of the processes common to both tissue repair and disease, including angiogenesis, chemotaxis and cell proliferation; they also control the synthesis and degradation of extracellular matrix proteins. Their mode of action is to bind to the extracellular domain of a target growth-factor-receptor that, in turn, activates the intracellular signal-transduction pathways. The elucidation of some of the functions of growth factors in tissue repair has led to the conclusion that their controlled temporal expression could be important following surgical interventions and in the treatment of musculoskeletal disorders, including bone fractures, cartilage defects and muscle and tendon lesions. Platelets contain secretory vesicles loaded with important growth factors including in part, platelet-derived growth factors (PDGF), transforming growth factors (TGF), vascular endothelial growth factors (VEGF) and fibroblast growth factors (FGF). Influence of these growth factors in tissue repair has been extensively studied both in vivo and in vitro with positive results, while some studies were presented with less conclusive evidence. Platelet Rich Plasma (P.R.P.) is a rich source of these growth factors and defined as the volume of plasma fraction from autologous blood, with platelet concentration above baseline. Once the platelet concentrate is activated by one of different methods, a three-dimensional and biocompatible fibrin scaffold is formed, and a myriad of growth factors and proteins are released, progressively, to the local environment, contributing to the accelerated postoperative wound healing and tissue repair. Furthermore, this preparation promotes rapid vascularization of the healing tissue and, because it is autologous, it eliminates concerns about immunogenic reactions and disease transmission. It has been found that an increase of 2 to 6 fold in platelet count is sufficient to produce clinically efficacious results. The fact that P.R.P. can be obtained from autologous blood by simple centrifugation makes it an ideal candidate to deliver growth factors into the damaged tissue. Moreover the simplicity of the principle and the low production cost involved, in some regions of the world, makes it more attractive, however the data existing presently from clinical studies is controversial as the use of P.R.P. has not been proven conclusively for each and every single indication it is applied for.

CLINICAL APPLICATION OF PLATELET RICH PLASMA – *The way we see it* (cont.)

P.R.P. has been in clinical use as both a surgical as well as an outpatient procedure for the last 20 years in Europe and various studies have been published showing positive results.

Autologous PRP was first used in 1987 by Ferrari et al. following an open-heart surgery, to avoid excessive transfusion of homologous blood products. Since that time, the application of autologous P.R.P. has been safely used and documented in many fields including; orthopaedics, sports medicine, dentistry, ENT, Neurosurgery, ophthalmology, urology, and wound healing; as well as cosmetic, cardio -thoracic, and maxillofacial surgery. Cugat et al have used P.R.P. in treatment of athletes and showed good results in treatment of articular cartilage defects, Kon et al have compared the use of P.R.P. with HA for knee OA and have shown promising results. Peerbooms et al have shown that treatment of patients with chronic lateral epicondylitis with PRP reduced pain and significantly increased function, compared to corticosteroid injection. Sanchez et al have successfully used platelet-derived growth factors in treatment of bone non unions. Gardner et al. performed a retrospective study in a series of patients undergoing TKA. The patients were treated with an intra-operative platelet gel; resulting in lower blood loss, improved early range of motion, and fewer narcotic requirements. In Spain the team led by Dr Ramon Cugat have been using platelet-derived growth factors for treatment of various sports related injuries successfully and have a rich experience from applying more than 25,000 doses. In a study on patients with OA they found marked improvement in function and quality of life at the end of six months. However there are studies, which do not show any benefits from P.R.P. This discrepancy in data may be attributed to the fact that P.R.P. preparation techniques vary. Although the basic principle of the preparation of P.R.P. is similar it is well known now that the constituent of the P.R.P. varies depending on the centrifugation process and the kit used for the process. Dohan et al classified platelet preparations into four main categories depending on the amount of leucocytes and fibrin in the preparation. These are Pure-Platelet rich Plasma, Leukocyte-Platelet Rich Plasma, Pure-Platelet Rich Fibrin and Leukocyte and Platelet Rich Fibrin. Some authors believe that leukocyte is beneficial because of its anti bacterial properties and others believe that that metallo-protienases present can destroy the growth factors and effect cell survival by free radical production.

We have been using P.R.P. in both surgical and in out patient settings for various conditions like osteoarthritis, tendonitis and cartilage repair. We believe that P.R.P. administered locally is effective because it modifies the biological environment and triggers regenerative mechanisms and may stop the progress of disease. Our technique of P.R.P. preparation involves centrifugation of 8 ml of venous blood in a tube with cell separator gel for 9 minutes at the speed of 3500 rpm(fig). With this technique we found that our P.R.P. has 2-4 fold increase in the platelet count and around 58% recovery of leucocytes. We believe that optimal benefit can be obtained at this level of platelet count as studies have shown that too high a concentration of platelets have paradoxical inhibitory effects. The platelet concentrate that we obtain is similar to that of Anitua's PRGF.

The P.R.P. obtained is locally injected under aseptic precautions, we do not pre activate our platelets but let the thrombin in the tissue activate them as this ensures a slow and more sustained release of growth factors mimicking natural clot formation. We usually treat the patients with 2 P.R.P. injections at monthly interval for chronic conditions like O.A. and resistant tendonitis. In addition the patient is advised regular physiotherapy and nutraceutical supplements as required. For acute conditions like ligament injuries we usually wait till signs of acute inflammation have reduced as we have seen that P.R.P. usually exacerbates the inflammation causing further discomfort to the patient. We inject P.R.P. to the site of injury and surrounding tissue once the inflammation is settled down. Our protocol involves local injection of 5 ml of P.R.P. along with immobilization and ice therapy. The patient is re-evaluated after 15 days and a second injection is performed if needed. If not, the patient is allowed to commence the rehabilitation program.

In summary, for over 20 years P.R.P. has been used safely in a variety of conditions with promising implications. Unfortunately, most studies to date are anecdotal or involve small sample sizes. Undoubtedly we are seeing increased clinical use of P.R.P.. The authors experience with PRP till date has been very encouraging with patients showing good response to the treatment. The authors have had success in treating professional athletes with acute injuries in an effort to accelerate their return to play. Currently a randomised controlled trial-comparing P.R.P. to HA in O.A. is underway at our institute and we will soon be coming out with the results. Our early results look encouraging and we are hopeful that this would be an important step in making P.R.P. an acceptable mode of treatment

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ISAKOS UEC AC-JOINT CONSENSUS MEETING, COPENHAGEN

Current Concept AC Joint Injuries

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Introduction

The acromioclavicular (AC) joint is a robust articulation that anchors the clavicle to the scapula. It is the pivot point between the clavicle, which is attached as a strut to the sternoclavicular joint, and the scapula, which moves in a complex pattern that is still not completely understood. This interface is what makes the AC joint simple yet oftentimes humbling to treat. However injuries of this joint represent 9% of all shoulder girdle injuries. As previously reported, 43.5% of AC joint injuries occur in patients in their twenties.

Classification based on physical examination and radiologic evaluation

The clinical examination should be performed with the patient standing or sitting in an upright position and an examination for neural-, vascular- or additional injuries of the adjoining joints should always be completed. The minimal standard for radiographic evaluation should include a bilateral Zanca view, which visualizes the ipsi- and contralateral AC joint on a single x-ray cassette and an axillary view to visualize type IV AC joint injuries with a posteriorly displaced distal clavicle. Classification is based on the clinical and radiologic findings and categorized according to Rockwood et al.

In type I injuries, the AC ligaments are sprained, but the AC- and CC-ligaments are intact with no palpable displacement of the distal clavicle. Radiographically, there is no widening, separation, or deformity at the AC joint.

In type II injuries the CC ligaments are intact, however the AC ligaments are torn. Moderate to severe pain at the AC joint a slightly superior position and increased horizontal mobility of the distal clavicle characterizes them.

In type III injuries both the AC and CC ligaments are torn, but the deltotrapezial fascia are intact. Both plain and bilateral Zanca x-rays reveal that the distal clavicle is 100% displaced superiorly in relation to the acromion. A shrug test has been described to differentiate a type III injury from a type V injury. If when the patient shrugs his or her shoulders the joint reduces, then the deltotrapezial fascia is intact and a type V injury can be ruled out.

In type IV injuries, the AC-, CC-ligaments and the deltoidal fascia are ruptured. The distal clavicle is displaced posteriorly into the trapezius muscle and may tent the posterior skin usually associated with increased pain. Examination of the seated patient from above will reveal that the distal clavicle is displaced posteriorly when compared with the uninjured shoulder. Note that the posteriorly displaced clavicle is best appreciated on an axillary radiograph.

Type V injuries represent a greater degree of soft tissue damage with both, the AC- and CC-ligaments ruptured and the deltotrapezial fascia being stripped off the acromion and the clavicle. The distal end of the clavicle appears to be grossly displaced superiorly towards the neck. The scapula is translated anteriorly and inferiorly as it migrates around the thorax. On bilateral Zanca view there is 100–300% increase in the CC interspace.

Type VI injuries are inferior AC joint dislocations into a subacromial or subcoracoid position and have been described only rarely in the literature and are mostly combined with high energy trauma. Associated injuries include clavicle and upper rib fractures, and upper root brachial plexus injuries. It is not uncommon for these patients to have transient paraesthesias that subside after reduction.

Clinical indications based on classification

Type I and II lesions are generally treated conservatively with a sling, ice, and a brief period of immobilization, typically lasting 3 to 7 days. The main goals of treatment, whether surgical or non-surgical, are to achieve a pain-free shoulder with full range of motion, normal strength, and no limitations in activities. The demands on the shoulder will differ from patient to patient, and these demands should be taken into account during the initial evaluation. Basically return to full motion, no pain and full function with the ability of self protection enables to return to competitive sports. If full function is achieved and only pain remains, a local anesthetic injection could be considered to allow return to professional sports.

However, no overall consensus exists on treatment for type III dislocations although a trend toward initial non-operative treatment is presently favored in most cases. Some of these conservatively treated patients will have persistent pain and an inability to return to their sport or job. Subsequent surgical stabilization, albeit delayed, has still allowed return to sport or work in such cases. It is important, however, to remember that, at 2-year follow-up, non-operatively versus operatively treated type III injuries have no difference in strength. Also, in a prospective study of type III injuries conducted by Larsen and Hede, rates of persistent symptoms were similar between the operative (2/25, 8%) and non-operative (3/29, 10%) groups. However, consideration of other factors such as type of sport, timing of injury relative to athletic season, position in which the athlete competes or the throwing demands may alter the procedure. In light of the controversy and clear lack of evidence supporting acute surgical management of grade III AC separations, we recommend to treat all patients initially with 3-4 weeks of non-operative management. If the patient is still in pain, intra-articular injection of local anesthetic can be used to allow for immediate return to athletics. A patient with a grade III AC separation qualifies for surgical reconstruction after a failed short course of non-operative management as defined by persistent symptoms.

Operative treatment is generally the accepted method for complete AC joint injuries (types IV, V, and VI) because of the significant morbidity associated with persistently dislocated joints and severe soft tissue disruption.

ISAKOS UEC AC-JOINT CONSENSUS MEETING, COPENHAGEN (*cont.*)

Conservative Management

Commonly known contraindications for elective surgical procedures (non-tolerable risk for anesthesia, increased risk of intra operative bleeding, increased risk of infection, etc.) may prohibit or delay surgical treatment for all types of AC joint dislocations. However, non-operative treatment is generally chosen as initial treatment for type I, II. For type III injuries this decision is made on a case-by-case basis with an emphasis on initial non-operative treatment.

Such non-surgical treatment is centered on a brief period of immobilization in a sling to reduce stress on the AC joint in lifting up the upper extremity. This is accompanied by ice and oral analgesic medication if tolerated. The patient is encouraged to initiate range of motion activities within the first week of injury to reduce pain and inflammation in an effort to decrease associated morbidity. The authors use the 4-part physical therapy protocol suggested by Gladstone et al. for the non-surgical treatment of grade I, II, and III AC joint injuries in athletes. Phase 1 focus on the elimination of pain and protection of the AC joint through sling immobilization (3–10 days), along with the prevention of muscular atrophy. The authors prefer to start with closed-chain scapular activities that are easily tolerated early in the post-injury period, allowing the patient to work on scapular strength and motion without provoking undesirable increases in symptoms. These exercises unload the weight of the upper extremity, allowing the patient to focus on isolating scapular motion. Phase 2 consists of range of motion exercises to restore full mobility and a gradual progression of strengthening with the addition of isotonic exercise. Phase 3 involves advanced strengthening to enhance the dynamic stability of the AC joint. Phase 4 incorporates sport-specific training to prepare for a full return to prior level of activity. Full rehabilitation should be achieved within 6–12 weeks.

Surgical Treatment

Currently, a wide range of procedures aiming at a permanent reduction of AC joint dislocations exists. However, none of these has been shown to be the "overall gold standard". Most current techniques focus on reconstruction of the coraco-clavicular (CC) ligaments in reference to anatomic studies emphasizing the biomechanical importance of the CC-ligaments for vertical stability of repairs of the AC-Joint. Open and arthroscopically assisted procedures are currently known. Of these, anatomic techniques focus on reconstruction of both the conoid and trapezoid ligaments. However, improved horizontal stability may further be facilitated by a reconstruction of the CC ligaments in an early stage after injury with an approach of clavicle and acromion, allowing subsequent healing of the torn AC and CC ligaments. Alternatively an additional reconstruction of the AC ligaments could be performed, which is seen advantageous especially in chronic instabilities with decreased healing potential of the AC ligaments. Suture pulley systems can also be combined with free grafts to provide an additional biologic component. Currently, these techniques depend on a minimal tunnel width of 6 mm, which allows for placing only one tunnel in the coracoid in a non-anatomic technique.

The authors intend to demonstrate and discuss only principle surgical techniques. Procedures are separated into open and arthroscopically assisted procedures. Representative for each, a anatomic and a non-anatomic technique are described. General consensus exists that a arthroscopic glenohumeral diagnostic should be performed previous to either arthroscopic or open reconstruction techniques to address possible concomitant intra-articular lesions as described by Tischer et al.

Open Anatomic

The anatomic coraco-clavicular reconstruction (ACCR) enables to reconstruct simultaneously the CC ligaments (trapezoid and conoid) and the AC ligaments for optimized restoration of biomechanical function (Figure 1). This technique restores function of both the CC ligaments and the AC ligaments in an anatomic procedure with the use of an allogenic or autologous tendon graft (semitendinosus). The graft is passed around the coracoid and through two clavicular tunnels, where it is fixed with tenodesis screws. It is important to place the tunnels in the anatomic insertion area of the trapezoid and conoid ligaments (25mm and 45mm medial to lateral edge of clavicle). The remaining longer limb (exiting the lateral tunnel) is then used to reconstruct the posterior and superior AC ligaments (Figure 2).

The use of a free tendon graft placed in an anatomic position attempting to reproduce the trapezoid and conoid ligaments has been shown to perform as the intact coracoclavicular ligament complex. Costic et al. found that the anatomic coracoclavicular reconstruction more closely approximates the stiffness of the native coracoclavicular ligaments than a standard Weaver-Dunn repair. Grutter and Petersen have also shown a successful variation in reconstructing the AC and coracoclavicular ligaments.

Open Non-anatomic

The Weaver Dunn Procedure represents an open procedure, which uses the detached coraco-acromio ligament as a retaining structure for the distal clavicle. The modification of this non-anatomic technique described by Weaver and Dunn involves transfer of the coraco-acromial ligament to the end of the distal clavicle to restore joint stability with an additional suture construct for increased primary stability. This approach, along with various technical modifications, is still widely utilized to reconstruct the CC ligaments, although not anatomic and considered to be inferior in its biomechanical properties compared to the other techniques. The basic surgical steps of the procedure involve the resection of the distal clavicle and the release of the coraco-acromial (CA)-ligament from the acromion. This is subsequently fixed to the distal end of the clavicle to reconstruct the CC-ligaments, although the insertion zone of the ligaments cannot be reproduced by this procedure. From a biomechanical perspective, the importance of the coracoclavicular ligaments and AC ligaments in controlling superior and horizontal translations has been elucidated. Therefore the coracoacromial ligament as a graft source transferred to the distal clavicle represents only 20% of the ultimate load of the intact coracoclavicular ligament complex.

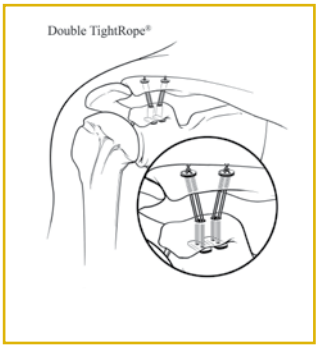
Arthroscopically Assisted Anatomic

Based on the open anatomic ACCR technique, an arthroscopic modification was developed to pass the tendon graft under the coracoid and through the clavicle tunnels (Figure 3). A lateral portal (scope) and two anterior working portals are used to prepare the coracoid and the clavicle tunnels, which have been drilled through a small skin incision. Under arthroscopic view a suture is passed underneath the coracoid to later pass a tendon graft. The graft is then "whip-sawed" and finally fixed in both tunnels with two tenodesis screws. The tunnels are placed in the anatomic insertion zones of the conoid and trapezoid ligament.

For acute injuries, the double cortical button techniques according to the description of Walz, Imhoff et al. can be used (Figure 4). The basic idea of this technique is to place two cortical button pulley devices through the clavicle and coracoid into an anatomic position corresponding both the conoid and the trapezoid ligament. Performed in an early stage after the initial injury, this technique is thought to approache the clavicle and the acromion in a physiologic way to promote healing of the torn AC- and the CC-ligaments.

With the help of the aiming instrument, two 4 mm tunnels are drilled through the clavicle and the coracoid. The important step is to reproduce the anatomic position of the conoid and trapezoid ligament by placing the tunnels accordingly. Finally two suture pulley systems are passed through the tunnels and fixed after tensioning the sutures.

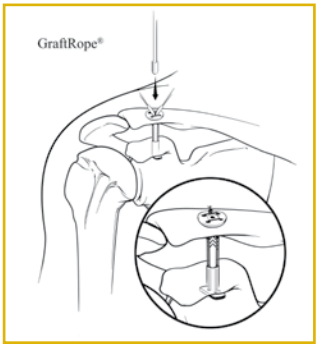
Arthroscopically assisted non-anatomic:



Single Cortical Button with semitendinosus augmentation combines a single pulley device with an allogenic or autologous graft. It only reconstructs both CC ligaments as one combined structure and is therefore not seen an anatomic procedure. However it enables to reconstruct the CC ligaments in a feasible one step procedure with a cortical button system for primary stability and additional biology at the same time (Figure 5).

The underside of the coracoid is prepared arthroscopically and an AC target guide is used to drill a K-wire through the center of the clavicle (30 mm medial to the AC joint) and the base of the coracoid. The wire is overdrilled with a 6 mm cannulated reamer to create a 6 mm tunnel. The implantable device consists of two cortical buttons connected by a pulley-cinch mechanism of #5 high-strength suture. A doubled-over semitendinosus allograft is tied to the subcoracoid button using #2 "high-strength" suture. With the help of a passing wire this construct is passed through the tunnel and the coracoid flip button can be blocked under the coracoid. The sutures are then tied together over the clavicular button and screw secures the graft after tensioning it in the clavicle tunnel to complete the reconstruction.

Rehabilitation



Directly after surgery for AC-joint reconstruction, the patient is placed in a platform brace for the first 6–8 weeks. This provides support and protects the surgical repair against the pull of gravity and excessive loads. The brace may be removed for grooming and supine range of motion exercises only.

Following removal of the brace, patients are referred to rehabilitation for active assistive range of motion in all planes. Motions that may increase stress on the AC- or SC-joint, specifically IR behind the back, cross-body adduction, and end-range forward elevation, are approached cautiously and within a patient's own pain threshold. The authors prefer to initiate range of motion exercises with limb-supported activities like the table or wall slide.

At 12 weeks, if there is a pain free range of motion, strengthening exercises are begun. All isotonic strength activities are withheld for 12 weeks because of concern about the ability of the surgical construct to tolerate a repetitively applied load. However, closed-chain scapular exercises and kinetic chain activities are allowed starting at 8 weeks. From 12 to 18 weeks, exercise is progressed to include isotonic strength activities. Weight training may begin at 3-5 months post-op. Generally it requires 9 months to a year for patients to regain peak strength particularly with pressing activities, or lifting from the floor as in a dead lift.

Full article and references also available online at www.isakos.com.

ULTRASOUND GUIDED INJECTIONS IN SPORTS MEDICINE – If *you don't use it, you lose it!*

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Allow us to start with the bottom line, before we move to the science.

If you are injecting suspected pathology without using Ultrasound, it is wrong! Not only may the patient have a painful injection site, but you will have most probably missed the target site by a few millimeters, maybe more, while your precious medication, regardless of its kind, is gone, vanished within healthy surrounding tissues which did not need to be treated. Gone, gone, gone.

Yep, we know. You have performed hundreds of injections before Ultrasound (US) machines were invented. It all went well and you always had 100% success rate, especially when infiltrating 20ml of local anesthetic to the sub acromial bursa. Well my friends, times have changed. We are aiming for better outcomes, better documented results, better understanding of our procedures (both for our patients and ourselves) and there are more options for injectables. At times the required medication volume is so small that it must be placed exactly where it is needed.

Figure 1: *MRI and US images of Tibialis Posterior tenosynovitis and micro-tears in a professional volleyball player. An US guided injection of PRP\PRGF was performed after aspiration of the tendon sheath fluid. The procedure was repeated 3 times and yielded excellent results with 4 years of follow up.*

Yes, in the patellar tendon lesion, not in the fat pad below it!

Ultrasonography has proved to be a useful tool for clinical evaluation and interventional radiology. It is widely advocated in joint and soft tissue aspiration and injection technique in clinical practice. Many clinical, cadaveric and radiological studies have shown that US-guided injections are more accurate than palpation-guided (blind) injections in various joints and soft tissue structures. Even in joints such as the knee where we all "sure" that "we got it all right".

Ultrasound-guided injection offers a technique with direct visualization, real-time guidance of needle insertion, and confirmation of injectate inside or around the desired location. This optimizes injectate placement when optimal accuracy is necessary for both diagnostic or therapeutic purposes and can assist in avoiding iatrogenic injury or irritation to adjacent tissues and structures during the procedure. Moreover, the procedure is performed without exposing the patient and physician to the risks of radiation. Once a team work of an MSK radiologist and a sports surgeon is established, it can be done in a quick, reproducible and simple manner.

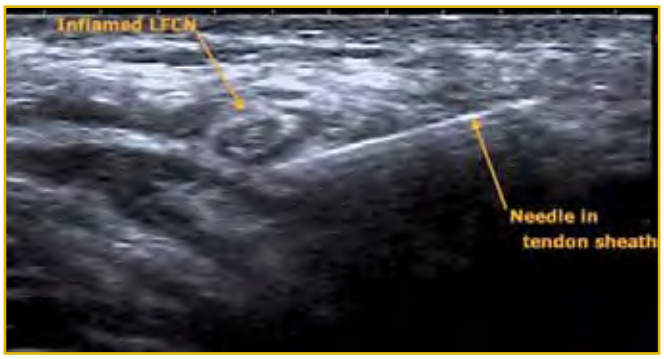


Figure 2: *A national soccer team goalkeeper sustained a hip hyper-extension injury with on-going irritation of the LFCN of thigh. The nerve sheath was injected under direct US visualization which resulted in complete symptom resolution.*

Technical:

Ultrasound machines range from large full scale units to small laptop based portable machines. Technology has been rapidly progressive and portable units are readily available and can now produce high quality images, adequate for MSK interventions.

Ultrasound machines generate electrical impulses which are converted to ultrasound waves by transducers in the ultrasound probe. Conducting material, typically a water based gel, allows transmission of the sound wave into tissue. Sound waves travel through the body with partial reflection of the wave at each tissue interface. This reflected sound wave (echo) is converted back into an electrical pulse by the transducer forming the image. Doppler and Color imaging uses the frequency shift in returning echoes to assess movement (usually blood flow). The red and blue colors

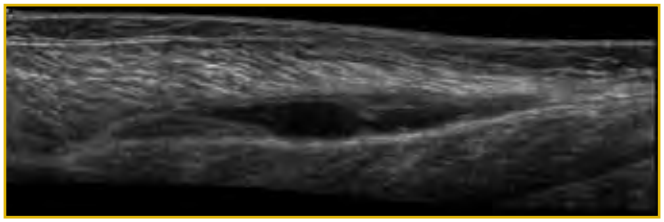


Figure 3: *A professional basketball player developed a seroma after an acute gastrocnemius tear. The seroma was evident and easily measured on US. It was evacuated under direct visualization, followed by a therapeutic PRP injection.*

depict the direction of flow relative to the transducer, rather than arterial versus venous flow.

For all machines selection of the ultrasound probe (transducer) will have a key bearing on image quality and needle visualization. Transducers come in curved or linear arrays. Linear arrays are used for most musculoskeletal imaging and have greater resolution. This is explained by higher frequency sound having a smaller wavelength which allows reflection from smaller structures, optimal for tendons, ligaments and tissues in the superficial musculoskeletal system. Spatial resolution in superficial tissues can be less than 1mm giving exquisite detail. The trade-off is high frequency US has reduced tissue penetration and poor visualization of deeper Tissues. For deeper structures and/or larger patients, curved arrays using a lower frequency may be needed for sites such as hip joint injections. Most systems will also require the operator to select an imaging algorithm suited to the target site (e.g. 'MSK', 'MSK superficial', 'venous assessment'). This software will aid image optimization.

In the musculoskeletal system ultrasound images are usually described as in 'short axis' or 'transverse' and 'long axis' to the imaged structure rather than axial, Sagittal or coronal, such as with MRI. This simple method of annotation also works well for curvilinear structures such the distal biceps or iliopsoas which require imaging in oblique planes. Imaging planes for injection are less determined by true orthogonal planes but by a balance of visualization of the target site, comfort for the patients and avoidance of adjacent neurovascular structures. Injection is ideally performed using real time visualization with the ultrasound probe over or near the area of interest. The needle is placed lateral to the probe but is directed into the field of vision. Visualization of the needle is improved with keeping the ultrasound probe as close to 90 degrees / perpendicular to the plane of the needle as possible. Small fine needles such as 25G remain readily visible for superficial procedures. Sometimes due to anatomical limitations the injection may be performed using the "short axis", inserting the needle "over the probe"– in the transverse plane. This specific technique is more difficult to manage and visualization of the needle is less confident, but in some instances it is the most convenient way to hit the target (Fig 4 adjacent).

***Figure* 4:** *PRP guided injection for long standing Achilles paratenonitis of an ironman.*

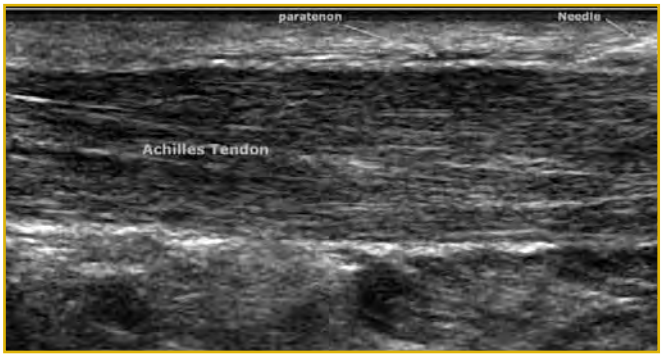


***Figure* 4A:** *Long section view of heterogenous and swollen tendinopathic right Achilles tendon. Arrow indicates 22G needle at paratenon.*

***Figure* 4B:** *Short axis view right Achilles tendon. Arrow indicates needle tip. PRP injectate fills paratenon space.*

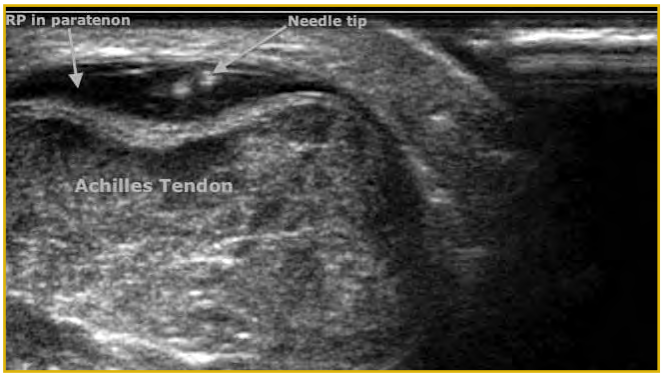


***Figure* 4C:** *Right Achilles tendon long section. Arrow indicates needle. Hypoechoic (black) PRP injectate fills paratenon space.*

ULTRASOUND GUIDED INJECTIONS IN SPORTS MEDICINE – *If you don't use it, you lose it!* (cont.)

Tips and Pearls

Obtain consent and discuss expectations of the procedure before preparation of materials. Discussion of the procedure while your back is turned while drawing up medication can lead to distraction and mistakes. It may also seem unprofessional. A relaxed patient makes for a better procedure for everyone.

- Ensure the patient does not have a rash over the target area or a current infection (if you don't ask they won't tell). Infectious complications are rare but particularly with steroid injections, patients should be screened for risk factors. If injecting steroid, check if the patient is diabetic.
- Scan and review the area of interest before marking the patient. Confirm the expected pathology is present and matches with any preceding US, MR or other imaging. Mark the plane of imaging and entry site after this target area review.
- Position the patient for your comfort as well as theirs. 15cm of increased table height and moving the patient closer to you can seem minor for 1 procedure, but can be the difference between no problems and a sore back at the end of the day, or a lumbar fusion at the end of the decade!
- If initially giving lignocaine, note the plane of entry to guide needle placement for the following therapeutic injection.
- If planning to swap syringes rather than withdraw the lignocaine needle (i.e for steroid/ ropivacaine injection), make sure the needle is not screwed on too tight, as this risks losing the needle tip position.
- Ensure you prepare the proper equipment such as the correct needle and syringe size if aspirating body fluid (joint effusions, tendon sheath effusions or muscle hematoma), especially if planning to send for lab work.
- Plan what volume you need to inject and prepare accordingly. For example with a volume less than 2ml (such as with jumper's knee lesion) take less blood and prepare the PRP concentrate accordingly.
- As PRP needs to be activated immediately prior to injection, ensure all the equipment is ready and the needle is in place so you can activate and apply within seconds.
- Use a luer lock type syringe, especially if injecting into soft tissue that may have resistance, such as tendon lesions. This saves wasting injectate and avoids spraying it over your face!
- Patients can be anxious around the time of procedure and may not remember everything you say. A sheet of post-procedure care instructions for each procedures is good practice. This should include return to activity, pain relief (e.g. no NSAIDS for PRP), infection risk and follow-up.
- A pain chart with set times for recording response to the injection over a given time period is also useful for assessing diagnostic versus therapeutic effect.

Equipment Used:

- Examination bed. Many injections can be performed with patient seated. However even the young and fit can have vagal reactions. Having the patient supine or prone makes management easier.
- Ultrasound machine (portable or full scale system)
- Transducers: Linear high frequency (small and larger FOV), Curved array
- Permanent type marker pen for marking injection site
- Conducting agent: Standard gel for initial assessment and marking. Sterile water based gel or chlorhexidine solution for the injection.
- Sterile probe cover: Not used in all centers, but use is good practice
- Drapes / Keyhole drape: Use is good practice
- Local anesthesia: Lignocaine 1% (adrenaline usually not required)
- Syringes: luer lock generally, 3, 5 and 10ml. (20ml can be required for calcium aspiration)
- Antiseptic solution (iodine or chlorhexidine based)
- Gauze swabs
- Small tegaderm or similar dressing for end of procedure
- Connecting tubing: bore of tubing should be appropriate for needle size
- Needles:
  - 25G local anesthesia, steroid injection (avoid small diameter for PRP)
  - 22G: autologous blood /PRP, steroid injection/ local anesthesia in deeper tissues where spinal needle required.
  - 20G: Autologous blood / PRP.
  - 18G: joint aspiration for infection, calcific tendinosis aspiration, ganglion aspiration, Hematoma aspiration.
  - 16G and 14G: ganglion and calcium aspiration (less commonly but ganglia contents are often semi-solid)

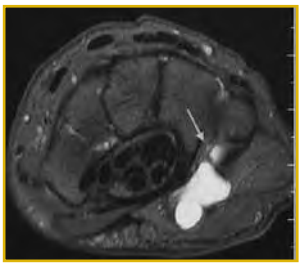


Figure 5: *Ultrasound Guided Aspiration of Guyon's canal ganglion compressing the ulnar nerve.*

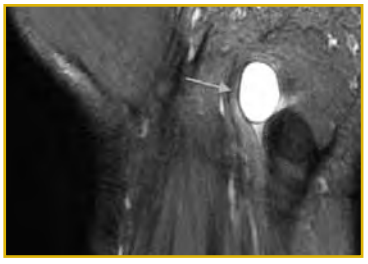


Figure 5B: *Axial and coronal PDFS MR image of wrist. Ganglion arising from pisotriquetral joint compresses the ulnar nerve (arrow) in Guyon's canal.*

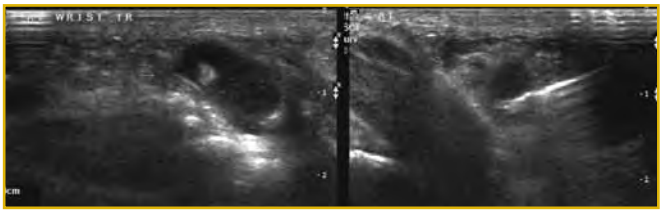


Figure 5C: *Short axis US of volar wrist. 18G needle placed to ganglion for aspiration, which has reduced in size from previous picture. Large needles have potential for neural laceration. Ultrasound allows clear visualization of needle tip away from ulnar nerve (arrow).*

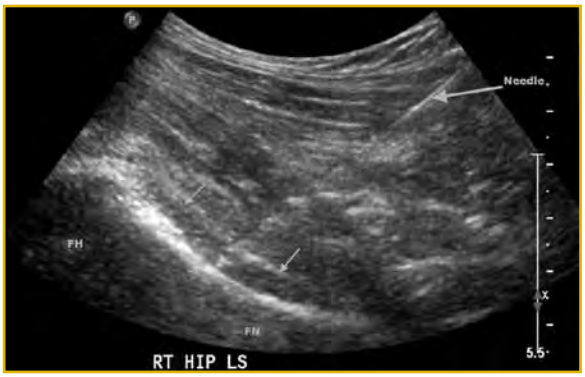


Figure 6: A. US *image in long section to the femoral neck* (FN) *using a curved transducer. Hip joint capsule marked with 2 small arrows while a* 22G *spinal needle placed to the femoral neck.* (FH = *femoral head*).

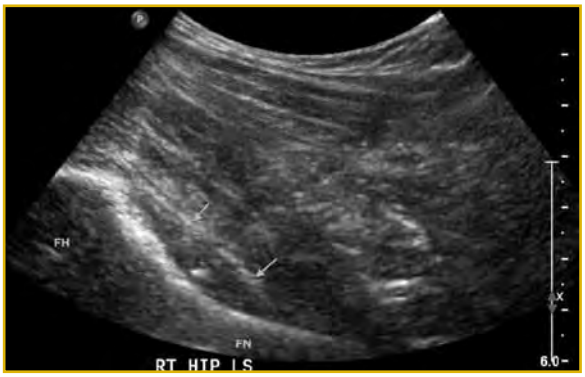


Figure 6B: A. US *image in long section to the femoral neck* (FN) *using a curved transducer. Hip joint capsule marked with 2 small arrows while a* 22G *spinal needle placed to the femoral neck.* (FH = *femoral head*).

Figure 7: *Mid Achilles Tendinosis with Neo-Vascularity.*

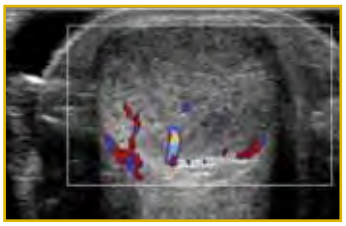


Figure 7A: US *short axis view of Achilles tendon with changes of tendinosis (swelling and a heterogenous, reduced echotexture). There is neo-vascularity with feeding vessels arising at the deep tendon border.*

Figure 7B: *Short axis Achilles tendon. Arrow indicates 22G needle with a reduction in neo-vascularity post polidocanol injection.*

Figure 8: *Supra-Spinatus Calcifying tendinitis aspiration.*

Figure 8A: *Short axis US view of calcific tendinosis of supraspinatus. The tendon is distended with echogenic material (white), representing the calcium deposits. A 25G needle has been placed to the calcification for local anaesthetic injection, prior to attempted aspiration.*

Figure 8B: *Short axis ultrasound of supraspinatus tendon. 18G needle placed to calcification for aspiration. Note the bevel of the needle is visibl.*

Full article and references also available online at www.isakos.com.

STANDARDIZED KNEE TERMINOLOGY

The Arthroscopy Committee has finalized a standardize knee terminology. The rationale for this is for surgeons to use one evaluation system for each anatomical structure of the knee. This will enable surgeons to compare and contrast different methods of treatments. We propose that is mandatory to use these terminologies when researching the knee.

The following terminologies have been determined:

Meniscal Evaluation–ISAKOS

Tear length

- Tear length indicates the length of the meniscal tear that reaches the surface of the meniscus. It does not include contained tears (MRI Grade II) that do not reach the surface of the meniscus.

Tear depth

- Tear depth mirrors the MRI classification of 0 to 3.
- A tear depth of 3A is a partial tear that extends through either the superior or inferior surface. A horizontal tear may also be a 3A partial tear.
- A 3B tear is a complete tear that extends through both the superior and inferior surfaces of the meniscus.

Location

- A zone classification system is used:
- Zone 1 includes tears at the meniscosynovial junction and tears with a rim width <3 mm. Zone 2 tears have a rim width of 3 to <5 mm.
- Zone 3 tears have a rim width ≥5 mm.

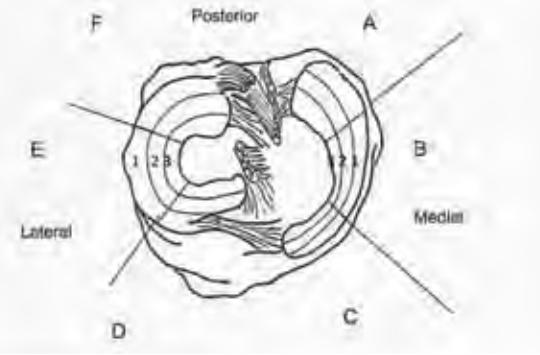


Figure 1. *The Meniscal Zone Classification System*

The use of the terms red-red, red-white and white-white to describe the zone of meniscal tears is discouraged. The vascular supply of the menisci varies and therefore cannot be precisely determined arthroscopically by meniscal tear rim width.

Tear pattern

The terms to describe different types of meniscal tears are:

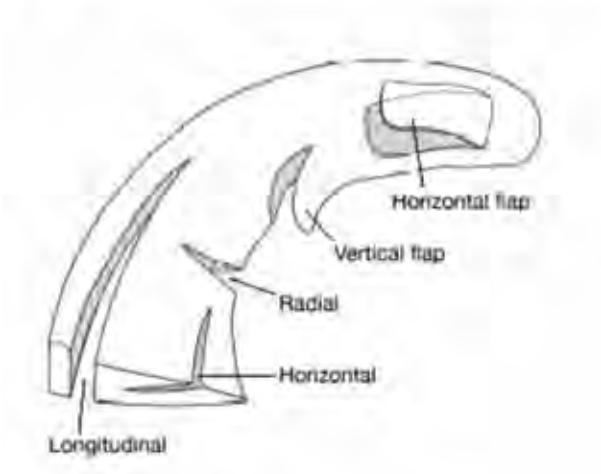


Figure 2. *Terms for meniscal tears as defined by the* ISAKOS *Meniscal Documentation Committee.*

Longitudinal-vertical tear

The longitudinal-vertical tear as pictured may be located anywhere along the meniscus. The extension of this tear may result in a bucket-handle tear.

Horizontal tear

The horizontal tear begins at the inner margin of the meniscus and extends toward the capsule.

Radial tear

The radial tear also begins at the inner margin and extends towards the capsule. This type of tear is typically located at the junction of the middle and posterior thirds of the lateral meniscus. These tears may extend completely through the meniscal rim, transecting the meniscus.

Flap tear

A flap tear may be either vertical or horizontal. The vertical flap tear extends through both the inferior and superior surfaces of the meniscus. The horizontal flap tear is an extension of the horizontal tear. Either the inferior or superior surface the meniscus may remain intact in a horizontal flap tear.

Complex tear

This term describes complex patterns that demonstrate tearing in several planes.

Discoid meniscus

The discoid meniscus is a congenital variance that usually occurs laterally. Watanabe classified this abnormality into three types. The incomplete discoid type is larger than a normal meniscus and has normal attachments. The complete discoid type covers the entire tibial plateau, but also maintains normal attachment. The third type of discoid meniscus lacks a posterior capsular attachment and is more often symptomatic than the other two types.

Ligament Evaluation – Objective IKDC

Patient Name:_____ **Date of Birth:**____/____/____ (Day / Month / Year)

Gender: F M **Age:**_____ **Date of Examination:**____/____/____ (Day / Month / Year)

Generalized Laxity:	tight	normal	lax	
Alignment:	obvious varus	normal	obvious valgus	
Patella Position:	obvious baja	normal	obvious alta	
Patella Subluxation/Dislocation:	centered	subluxable	subluxed	dislocated
Range of Motion (Ext/Flex):	Index Side:	passive____/____/____		active____/____/____
	Opposite Side:	passive____/____/____		active____/____/____

SEVEN GROUPS	FOUR GRADES A Normal	B Nearly Normal	C Abnormal	D Severely Abnormal	*Group Grade A B C D
1. Effusion	None	Mild	Moderate	Severe	
2. Passive Motion Deficit					
☒Lack of extension	<3☒	3 to 5☒	6 to 10☒	>10☒	
☒Lack of flexion	0 to 5☒	6 to 15☒	16 to 25☒	>25☒	
3. Ligament Examination (manual, instrumented, x-ray)					
☒Lachman (25☒ flex) (134N)	-1 to 2mm	3 to 5mm(1+) <-1 to –3	6 to 10mm(2+) <-3 stiff	>10mm(3+)	
☒Lachman (25☒ flex) manual max Anterior endpoint:	-1 to 2mm firm	3 to 5mm	6 to 10mm soft	>10mm	
☒Total AP Translation (25☒ flex)	0 to 2mm	3 to 5mm	6 to 10mm	>10mm	
☒Total AP Translation (70☒ flex)	0 to 2mm	3 to 5mm	6 to 10mm	>10mm	
☒Posterior Drawer Test (70☒ flex)	0 to 2mm	3 to 5mm	6 to 10mm	>10mm	
☒Med Joint Opening (20☒ flex/valgus rot)	0 to 2mm	3 to 5mm	6 to 10mm	>10mm	
☒Lat Joint Opening (20☒ flex/varus rot)	0 to 2mm	3 to 5mm	6 to 10mm	>10mm	
☒External Rotation Test (30☒ flex prone)	<5☒	6 to 10☒	11 to 19☒	>20☒	
☒External Rotation Test (90☒ flex prone)	<5☒	6 to 10☒	11 to 19☒	>20☒	
☒Pivot Shift	equal	+glide	++(clunk)	+++(gross)	
☒Reverse Pivot Shift	equal	glide	gross	marked	
4. Compartment Findings			crepitation with		
☒Crepitus Ant. Compartment	none	moderate	mild pain	>mild pain	
☒Crepitus Med. Compartment	none	moderate	mild pain	>mild pain	
☒Crepitus Lat. Compartment	none	moderate	mild pain	>mild pain	
5. Harvest Site Pathology	none	mild	moderate	severe	
6. X-ray Findings					
Med. Joint Space	none	mild	moderate	severe	
Lat. Joint Space	none	mild	moderate	severe	
Patellofemoral	none	mild	moderate	severe	
Ant. Joint Space (sagittal)	none	mild	moderate	severe	
Post. Joint Space (sagittal)	none	mild	moderate	severe	
7. Functional Test					
One Leg Hop (% of opposite side)	☒90%	89 to 76%	75 to 50%	<50%	
****Final Evaluation**					

* Group grade: The lowest grade within a group determines the group grade

** Final evaluation: the worst group grade determines the final evaluation for acute and subacute patients. For chronic patients compare preoperative and postoperative evaluations. In a final evaluation only the first 3 groups are evaluated but all groups must be documented. ☒ Difference in involved knee compared to normal or what is assumed to be normal.

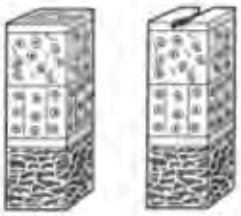
IKDC COMMITTEE AOSSM: Anderson, A., Bergfeld, J., Boland, A. Dye, S., Feagin, J., Hamer, C. Mohtadi, N. Richmond, J. Shelbourne, D., Terry, G. ESSKA: Staubli, H., Hefti, F., Holver, J., Jacob, R., Mueller, W., Neyret, P. APOSSM: Chan, K., Kurosaka, M.

Articular Cartilage - ICRS

ICRS Grade 0 - Normal

ICRS Grade 1 – Nearly Normal

Superficial lesions. Soft indentation (A) and/or superficial fissures and cracks (B)

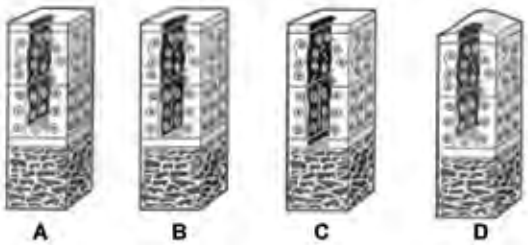


ICRS Grade 2 – Abnormal

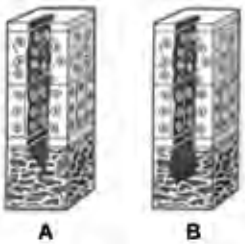
Lesions extending down to <50% of cartilage depth

ICRS Grade 3 – Severely Abnormal

Cartilage defects extending down >50% of cartilage depth (A) as well as down to calcified layer (B) and down to but not through the subchondral bone (C). Blisters are included in this Grade (D)



ICRS Grade 4 – Severely Abnormal



INSTRUCTIONS FOR THE 2000 IKDC KNEE EXAMINATION FORM

The Knee Examination Form contains items that fall into one of seven measurement domains. However, only the first three of these domains are graded. The seven domains assessed by the Knee Examination Form are:

1. *Effusion*
An effusion is assessed by ballotting the knee. A fluid wave (less than 25 cc) is graded mild, easily ballotteable fluid – moderate (25-60 cc), and a tense knee secondary to effusion (greater than 60 cc) is rated severe.

2. *Passive Motion Deficit*
Passive range of motion is measured with a gonimeter and recorded on the form for the index side and opposite or normal side. Record values for zero point/hyperextension/flexion (e.g. 10 degrees of hyperextension, 150 degrees of flexion = 10/0/150; 10 degrees of flexion to 150 degrees of flexion =0/10/150). Extension is compared to that of the normal knee.

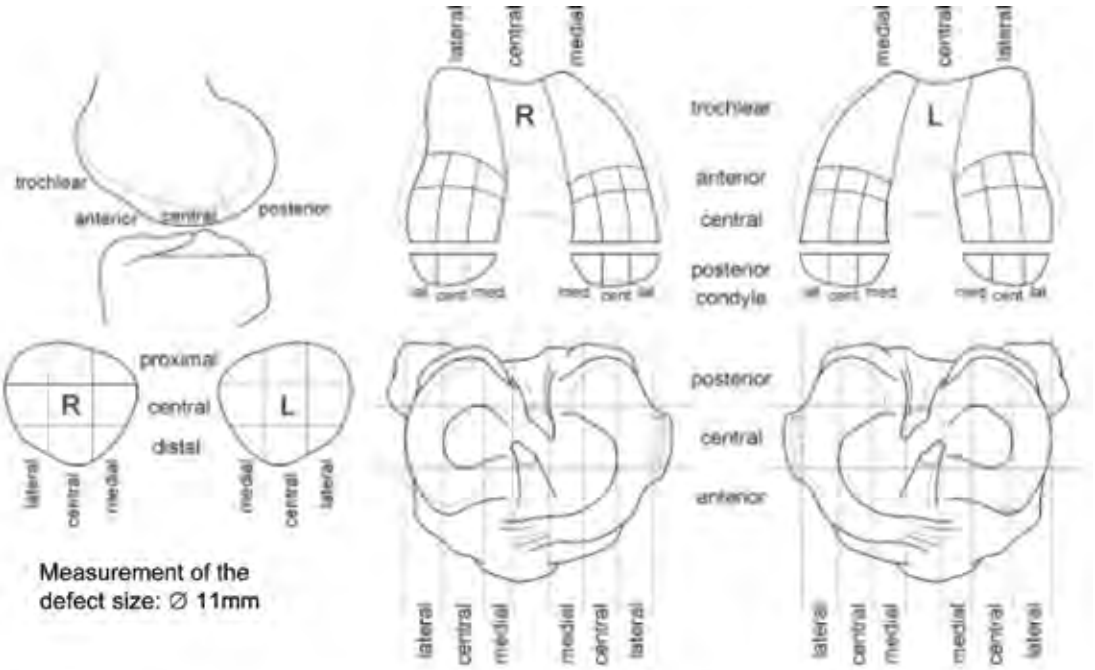
3. *Ligament Examination*
The Lachman test, total AP translation at 70 degrees, and medial and lateral joint opening may be assessed with manual, instrumented or stress x-ray examination. Only one should be graded, preferably a "measured displacement". A force of 134 N (30 lbs) and the maximum manual are recorded in instrumented examination of both knees. Only the measured displacement at the standard force of 134 N is used for grading. The numerical values for the side to side difference are rounded off, and the appropriate box is marked. The end point is assessed in the Lachman test. The end point affects the grading when the index knee has 3-5 mm more anterior laxity than the normal knee. In this case, a soft end point results in an abnormal grade rather than a nearly normal grade.
The 70-degree posterior sag is estimated by comparing the profile of the injured knee to the normal knee and palpating the medial femoral tibial stepoff. It may be confirmed by noting that contraction of the quadriceps pulls the tibia anteriorly. The external rotation tests are performed with the patient prone and the knee flexed 30° and 70°. Equal external rotational torque is applied to both feet and the degree of external rotation is recorded. The pivot shift and reverse pivot shift are performed with the patient supine, with the hip in 10–20 degrees of abduction and the tibia in neutral rotation using either the Losee, Noyes, or Jakob techniques. The greatest subluxation, compared to the normal knee, should be recorded.

4. *Compartment Findings*
Patellofemoral crepitation is elicited by extension against slight resistance. Medial and lateral compartment crepitation is elicited by extending the knee from a flexed position with a varus stress and then a valgus stress (i.e., McMurray test). Grading is based on intensity and pain.

5. *Harvest Site Pathology*
Note tenderness, irritation or numbness at the autograft harvest site.

6. *X-ray Findings*
A bilateral, double leg PA weightbearing roentgenogram at 35–45 degrees of flexion (tunnel view) is used to evaluate narrowing of the medial and lateral joint spaces. The Merchant view at 45 degrees is used to document patellofemoral narrowing. A mild grade indicates minimal changes (i.e., small osteophytes, slight sclerosis or flattening of the femoral condyle) and narrowing of the joint space which is just detectable. A moderate grade may have those changes and joint space narrowing (e.g., a joint space of 2–4 mm side or up to 50% joint space narrowing). Severe changes include a joint space of less than 2 mm or greater than 50% joint space narrowing.

7. *Functional Test*
The patient is asked to perform a one leg hop for distance on the index and normal side. Three trials for each leg are recorded and averaged. A ratio of the index to normal knee is calculated.



Femur

First lesion Second lesion

Side	Right	Left		
Condyle	medial	lateral		
Sagital plane	trochlear	anterior	central	posterior
Frontal plane	lateral	central	medial	

Cartilage lesion (Grade) (*)
Defect size pre-debridement mm
Defect size post-debridement mm

Tibia

First lesion Second lesion

Side	Right	Left	
Plateau	medial	lateral	
Sagital plane	anterior	central	posterior
Frontal plane	lateral	central	medial

Cartilage lesion (Grade) (*)
Defect size pre-debridement mm
Defect size post-debridement mm

Patella

First lesion Second lesion

Side	Right	Left	
Sagital plane	distal	central	proximal
Frontal plane	lateral	central	medial

Cartilage lesion (Grade) (*)
Defect size pre-debridement mm
Defect size post-debridement mm

Diagnosis: ☐ Traumatic cartilage lesion ☐ OD ☐ OA ☐ AVN ☐ Others

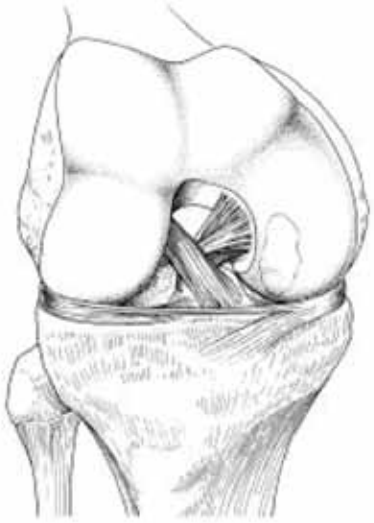
Biopsy/Osteochondral Plugs: Location: Number of Plugs: Diameter of Plugs:

Treatment: ☐ Shaving ☐ Drilling Others:
☐ Mosaic-Plasty ☐ Microfracture
☐ Autologous Chondrocyte Implantation (ACI)

Notes:

ICRS Classification of OCD-Lesions (Osteochondritis-Dissecans)

ICRS OCD I

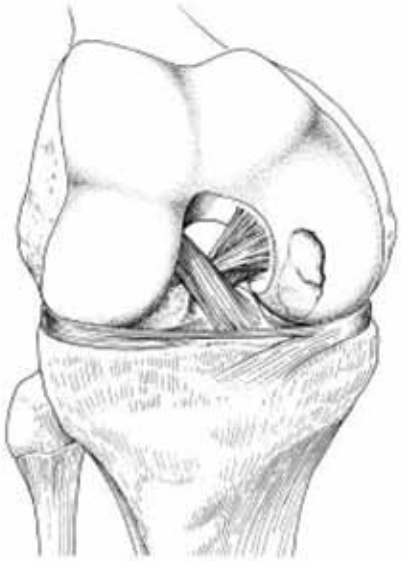


Stable, continuity: Softened area covered by intact cartilage.

ICRS OCD II

Partial discontinuity, stable on probing

ICRS OCD III



Complete discontinuity, "dead in situ", not dislocated.

ICRS OCD IV

Dislocated fragment, loose within the bed or empty defect.> 10mm in depth is B-subgroup

Criteria	Points	
Degree of Defect Repair I Protocol A [1]	* In level with surrounding cartilage * 75% repair of defect depth * 50% repair of defect depth * 25% repair of defect depth * 0% repair of defect depth	4 3 2 1 0
I Protocol B [2]	* 100% survival of initially grafted surface * 75% survival of initially grafted surface * 50% survival of initially grafted surface * 25% survival of initially grafted surface * 0% (plugs are lost or broken)	4 3 2 1 0
II Integration to Border zone	* Complete integration with surrounding cartilage * Demarcating border < 1mm * 3/4 of graft integrated, 1/4 with a notable border >1mm width * 1/2 of graft integrated with surrounding cartilage, 1/2 with a notable border > 1mm * From no contact to 1/4 of graft integrated with surrounding cartilage	4 3 2 1 0
III Macroscopic Appearance	* Intact smooth surface * Fibrillated surface * Small, scattered fissures or cracs * Several, small or few but large fissures * Total degeneration of grafted area	4 3 2 1 0
Overall Repair Assessment	**Grade I** **normal** **12 P** **Grade II** **nearly normal** **11-8 P** **Grade III** **abnormal** **7-4 P** **Grade IV** **severely abnormal** **3-1 P**	

Cartilage Biopsy **Location** _____

(1) Protocol A:	(2) Protocol B:
autologous chondrocyte implantation (ACI); periosteal or perichondrial transplantation; subchondral drilling; microfracturing; carbon fibre implants; others:	Mossaicplasty; OAT; osteochondral allografts; others:

Osteoarthritis–Radiographic Evaluation–Kellgreen–Lawrence

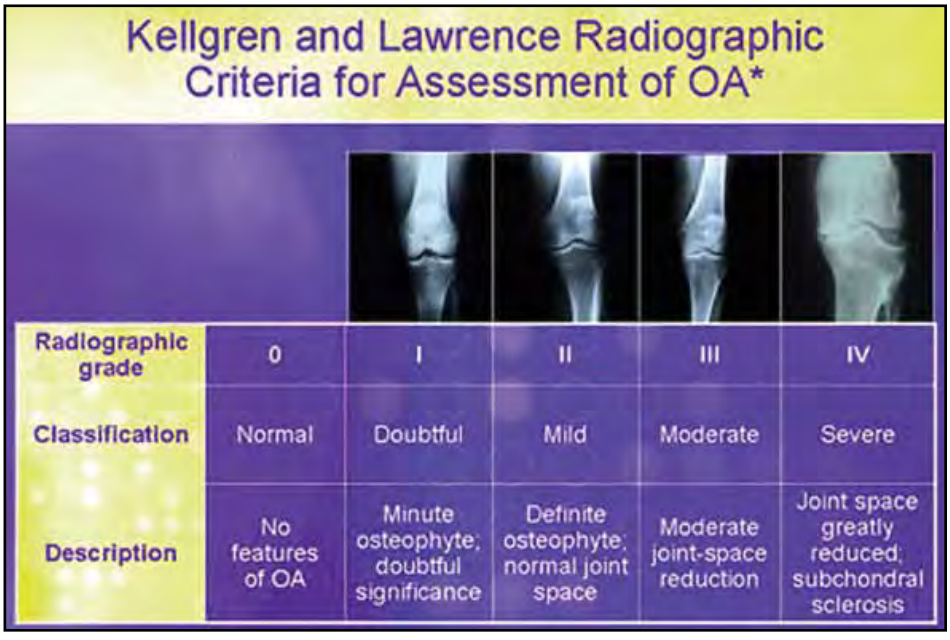
Grade 1: Doubtful narrowing of joint space and possible osteophytic lipping

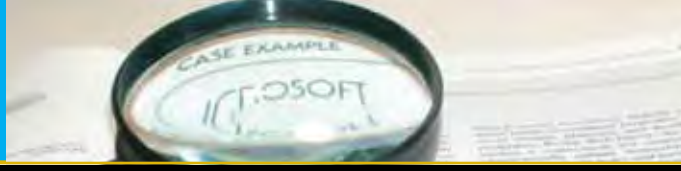
Grade 2: Definite osteophytes, definite narrowing of joint space

Grade 3: Moderate multiple osteophytes, definite narrowing of joints space, some sclerosis and possible deformity of bone contour

Grade 4: Large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone contour

Mark Clatworthy
Past Chairman, ISAKOS Arthroscopy Committee





A Discussion on Hip Arthroscopy

– Omer Mei-Dan, MD

CASE DISCUSSION

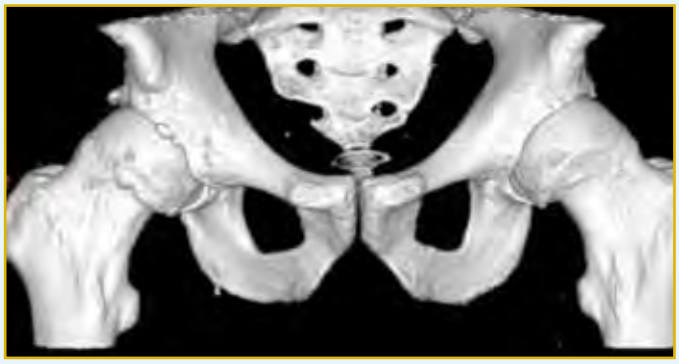
The Case. A 43 years old father of three children presented with 6 months of bilateral groin and hip pain. The pain was present most of the time, affecting activities of daily living as well as disturbing rest and sleep.

He used to play competitive rugby until the age of 34 subsequently gaining extra weight .

He enjoyed hiking with his family and playing social rugby, both activities curtailed due to his current hip disabilities.

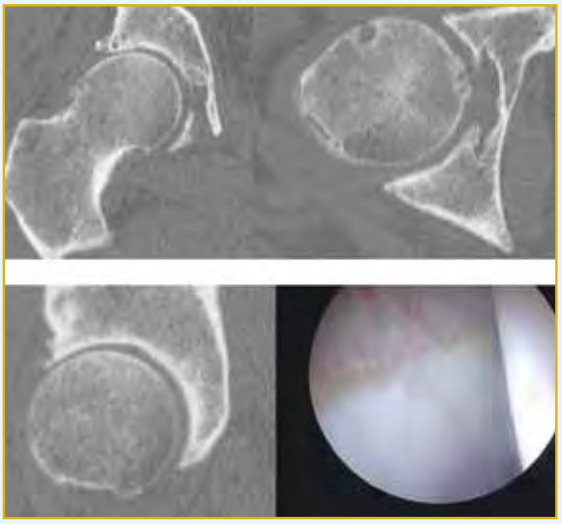
A clinical and xray diagnosis of bilateral femoroacetabular impingement was made. The patient had zero degrees internal rotation both sides. CT scan with 3D reformats confirmed cam-dominant FAI and early anterolateral arthrosis. At surgery severe FAI was found with up to 30% of the acetabulum demonstrating grade 4 full thickness chondral loss. Arthroscopic cam and pincer resection with labral re-fixation were performed sequentially with the two hips staged 6 weeks apart. Approximately 30% of the grade 4 area was resected with the pincer with microfracture of the remaining area. Post operatively partial weightbearing / crutches were employed for two weeks.

At the three month check, pain had worsened such that simple tasks of getting in and out of a car and walking were extremely difficult. X-ray showed that arthritis on both sides had progressed significantly with rapid loss of joint space.



2 months later the patient underwent bilateral total hip joint replacement.

It is known, and published, that some centers perform arthrosopic FAI procedures at early stages of the degenerative disease, on a regular basis, while for some that would be a clear contra indication.



- In your eyes, and experience, considering the patient's age and activity aspirations, what would be the most proper method of treatment?
- If you elected to proceed with surgical intervention, what would you do differently, if at all?
- Would you perform micro-fracture in such a patient and if so, what would be the post-op rehab protocol?
- What is your own experience with this patients group?
- Is localized anterolateral joint space loss an absolute contraindication to arthroscopic intervention?
  How much is too much?
- What do you think was the reason for the rapid deterioration with this patient?

A Discussion on Hip Arthroscopy

David Young (Melbourne, Australia)

Yes, arthroscopy may have a place in the early degenerative disease of the hip but our experience has found that if there is already significant radiological changes on plain Xray the success of arthroscopic intervention for FAI has a limited place. In order to try and find out when hip arthroscopy might be successful we undertook a study to classify rim pathology in the acetabulum then follow the patients after hip arthroscopy intervention where the end point was revision to THR. Our findings were that if you had greater than 30% of the roof area of the acetabular articular cartilage lost then results of arthroscopic intervention failed within a short time post surgery winding up in early THR. To measure this 30% we took the edge of the acetabulum through to the acetabular fossa, divided into thirds and if more than the outer third of articular cartilage was lost then the standard hip arthroscopy interventions seem to fail. In the case displayed, the joint space narrowing is one third of the Sourcil length and therefore it would be expected that articular cartilage was lost over that third. If you then measure the centre edge angle to the area of retained joint space it works out to be a centre edge angle of zero degrees and again we know this is effectively a severe dysplastic hip and therefore arthroscopic intervention is doomed to fail. Thus, on the basis of the Xrays provided, I would expect an early failure from arthroscopic intervention in this case.

Our treatment for superior pole for symptomatic superior pole osteoarthritis in a 40 year old male wishing to resume high level activity is still a resurfacing arthroplasty. Resurfacing gives a better functional result than THR, is more bone sparing and leads to a faster recovery time. Thus, in our practice the patient described would be selected for a resurfacing arthroplasty. Currently, our choice of prosthesis is the Mitch resurfacing arthroplasty, which has titanium sprayed back on the cup, leading to lower serum chromium and cobalt levels.

With respect to microfracture we would insist on the use of two crutches for 4 weeks post surgery followed by a single crutch for a further 2 weeks. During that time, pool and cycling activities are encouraged but walking for exercise not until 3 months post surgery and definitely no running or high impact activities for 6 months post surgery. I personally also use Synvisc, 3 injections one month apart, 2 mls being instilled into the hip joint. I do that in the rooms without Xray control simply using landmarks.

Marc Philippon (Vail, Colorado)

Based on previous research1 one of the primary factors in determining treatment in this patient would be the amount of joint space measured on radiographs. If the patient had >2mm of joint space, then hip arthroscopy would have been considered. In addition, the patient must be willing to commit to postoperative protocol and rehabilitation.

Initially we would have tried a non-operative protocol that included physical therapy with weight management. Injections may have also been an option. At arthroscopy, it is possible that a labral reconstruction may have been necessary. In addition, we would have spaced the 2 arthroscopies farther apart. The patient had to put full weight on the first hip just 6 weeks after surgery. In our practice, the patient would have been on crutches for 8 weeks to allow for maturation of the microfracture area.

A microfracture would have been performed following pincer resection if the cartilage surrounding the lesion was thick enough to provide a shoulder to hold the clot. Also the patient would need to be touch-down weightbearing for 8 weeks. Our protocol includes touch-down weightbearing for 8 weeks, CPM use for 4 to 6 weeks, and circumduction exercises to reduce the risk of adhesions.

Using our patient selection algorithm, most of these patients return to full activity and function. Patients continue to see improvement up to 2 years following arthroscopy. At 3 years, we have noted a 90% survivorship in patients over 50 with early osteoarthritis and >2mm of joint space (Philippon, et al. Arthroscopy, in Press).

In our practice we measure the joint space at 3 locations, the lateral edge of the sourcil, the middle of the sourcil, and in line with the fovea. Based on our research1, if any measurement is <2mm of space, then this is a contraindication for hip arthroscopy.

In our opinion, this patient was allowed full weight bearing too soon. The second arthroscopy was done during a time when the patient should have still been on crutches for the first surgery. Weight bearing too early can knock off the clot and weaken the subchondral plate. Resection of the cam in the arthritic hip can increase range of motion and increase stress on the area of the cartilage lesion leading to rapid progression of osteoarthritis.

Philippon MJ, Briggs KK, Yen YM, Kuppersmith DA. Outcomes following hip arthroscopy for femoroacetabular impingement with associated chondrolabral dysfunction: minimum two-year follow-up. J Bone Joint Surg Br. 2009 Jan;91(1):16-23.

Hassan Sadri, (Lausanne, Switzerland)

Although young and active, the patients CT show major chondral damage and minor subchondral Cysts. Correction of femoroacetabular impingement can be considered but has to be thoroughly discussed with the patient. When some joint space narrowing is present, then statistically at 5y follow-up over 50% need revision to total hip replacement. So this issue must be discussed with the patient and the patient must understand the goal of the treatment, ie 'a time buying procedure'. Possible revision to total hip replacement in case of failure must be discussed in every case. However, ideally the patient should avoid impact sports and encouraged towards in line activities without impact (ie cycling or crawl style swimming, for example).

The area of chondral damage is important. This is, in fact, mostly a superior or antero- superior chondral ulceration of the acetabular cartilage. Two options exist: AMIC (autologous matrix induced chondrogenesis) or MACT (matrix autologous chondrocyte transplantation). AMIC is basically a 'matrix protected' microfracture and can be performed as a single stage procedure. MACT needs two stages: first the impingement correction with chondrocyte harvesting, then the chondrocyte implantation with it's matrix during the second stage.

Microfracture would be necessary in this patient. Ideally a AMIC procedure should be performed because of the important surface of the lesion. CPM should be used at 1500 cycles/day. Partial weight bearing for 6 weeks is a minimum.

When using MACT(matrix autologous chondrocyte transplantation), in Tönnis grades I and II (ie some joint space left and minor cysts), at 2 years over 85% have satisfactory results. With AMIC procedure results are similar. This is much better than isolated impingement correction. However, this cohort needs longer term follow-up.

According to my experience, Isolated joint space loss is not an absolute contraindication to an arthroscopic intervention. However, aggressive treatment of the chondral defect (considered as an ulceration and not a global arthrotic damage), complete joint space loss (Tönnis grade IV) or major joint space narrowing with large subchondral cysts (Tönnis grade III), even in the very young age group, has always, sadly, failed in my experience.

In this patient, isolated microfracture may be insufficient without some chondral cavity damage filling, ie a physically resistant three dimensional matrix. So that may be a possible reason for the failure in this case. Partial weight bearing 5 kg for 6 weeks is a minimum if chondral damage is seen. Also, CPM with 1500 cycles/day has been shown to be enhance chondral healing in animal models. Removing the subchondral calcified layer with an adequate currette before microfracturing is also an essential technical issue.

Matthew Brick (Auckland, New-Zealand)

In my experience and given the degree of disability, the two choices of intervention would be arthroscopic CAM and Pincer resection with labral repair versus total hip joint replacement. Given the age and activity level of the patient, my first choice would be consideration of arthroscopic intervention.

The main difference in my management would be to stage the hips further apart and to unload the hip with 10-15kg partial weight bearing for at least six weeks after the surgery.

I would normally perform microfracture in such a patient and if the area of Grade 4 chondral damage is greater than 2sqcm, I would elect 10-15kg partial weight bearing for six weeks on crutches. My equivalent of CPM would be using an Exercycle with little or no resistance during this time. I would also introduce aqua jogging after wounds have been cleared at around 10 days.

I have had encouraging results in other men with CAM dominant FAI with very early anterolateral joint space narrowing. Provided there are no sub-chondral cysts away from the labrum and the loss of joint space is confined to the outer 5–10mm of the acetabulum, results have been good. However, I have become more conservative in my post-operative protocol with protected weight bearing for six weeks. I have had more problems with the central and posteroinferior early wear in Pincer dominant women over the age of 40.

My absolute contraindications at present are sclerosis and sub-chondral cyst formation across the roof of the acetabulum well away from the labrum and joint space loss that extends more than 5-10mm from the anterolateral labrum. Joint space loss in any other location including central and posterior as well as evidence of femoral head cartilage loss have also been contraindications.

Even minor anterolateral joint space loss would need to be less than 50% loss. My own understanding of the rapid deterioration in this patient would be the increased range of motion and altered weight bearing following a CAM resection and microfracture. Even the remaining cartilage in this situation is not normal and it may be that early motion under load is all that is required for rapid deterioration of the remaining cartilage. Given the acetabulum was of a completely normal depth, it is unlikely that instability was a factor.

Richard Villar (Cambridge & London, UK)

My own view is that it was perhaps a little optimistic to think that hip arthroscopic surgery would make a long-lasting difference to this patient. He does demonstrate FAI but the narrowing of the joint space, particularly in the weight-bearing area of the joint, suggests that hip arthroscopic surgery might struggle to achieve a decent improvement. The pre-operative imaging also suggests the beginnings of a central osteophyte. That said, it was clearly reasonable to suggest hip arthroscopic surgery, particularly in a patient of this age, but the recommendation would need to be balanced by rigorous informed consent as the chances of symptomatic improvement would have been well below what I would normally estimate. I would generally give a patient an 80% chance of symptomatic improvement after arthroscopic surgery for FAI. In this case I would guess you would be looking at 60% or less.

In terms of microfracture, I would probably have avoided it in this patient, simply because the moment I had seen the interior of the hip I would have thought that it was unlikely my hip arthroscopic procedure would improve the situation and, more than likely, the patient would need some form of hip arthroplasty.

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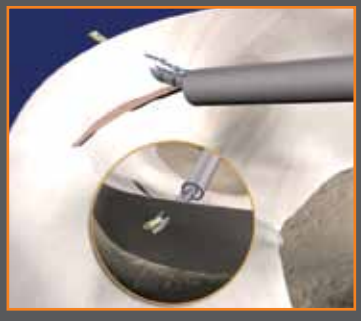

Retract needle and repeat previous step to deploy T2. A click confirms deployment.

Pull on the suture to advance the pre-tied sliding knot and reduce the tear.

Recess the knot into the meniscus with knot pusher/cutter, and trim excess suture.

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