ISAKOS CONGRESS 2023

Boston
Massachusetts
June 18–June 21

Autologous Bone Grafting With Periosteum Transfer For Treatment Of Large Talar Osteochondral Defects.

Dimitrios Nikolopoulos, George Safos,
Petros Safos, Konstantinos Moustakas,
Neoptolemos Sergides, Spyridon Bonatsos

Central Clinic of Athens; Greece

CENTRAL CLINIC OF ATHENS
RESEARCH & TREATMENT MEDICAL CENTER

ISAKOS CONGRESS 2023

Boston
Massachusetts
June 18–June 21

Disclosures: none

Purpose - Objective

Large talus osteochondral lesions (OCL) can be challenging to treat, as the damaged articular cartilage has a poor intrinsic reparative capability; and secondly because cause chronic pain and serious disability.

Our objective is to evaluate efficiency and effectiveness of autologous cancellous graft transplantation from proximal tibial metaphysis in the treatment of large talar osteochondral defects (>400mm^2) in adults.

Materials And Methods

- January 2010 - January 2021
- 55 patients (24 males - 31 females), of mean age 33.6 y.o. (range; 18 to 72) were operated for large talar OCL.

Table 1. Patients' Demographics Based on Age ans Sex								
Characteristic	**Mean**	**Median**	**Min**	**Max**	**Range**	**SD**	**Count**	**N%**
Age, y	**33,6**	33,9	18	72	54	12,5		
Sex								
Female							24	55,7
Male							31	44,3

OLTs	NO patients
200-220mm²	37/55
220-240mm²	18/55

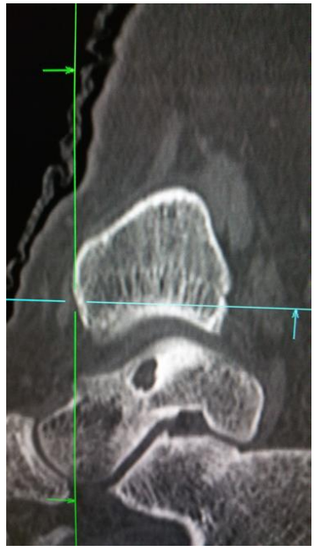
LOCATION OLTs	NO patients
Lateral	07/55 (12,7%)
Posteromedial	48/55 (87,3%)
BILATERAL	08/55 (14,5%)

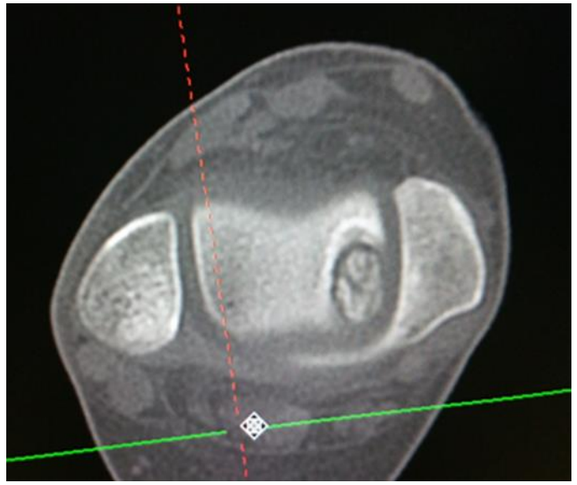
EXCLUSION CRETERIA - CONTAINDICATIONS

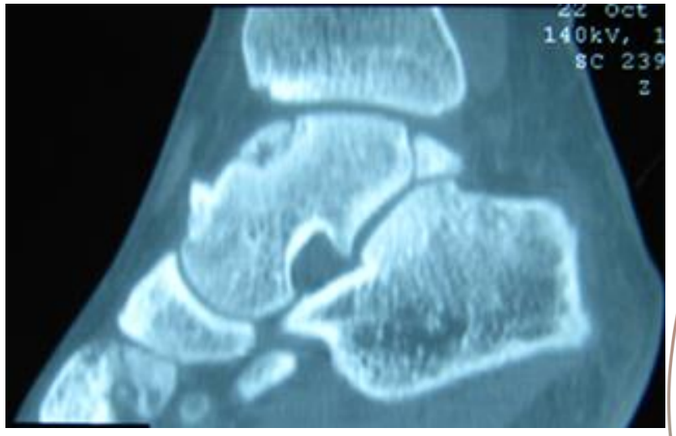
1. **Ankle instability** (clinically anteroposterior drawer and radiographically >10 degrees of talar tilt or >10 mm of anterior displacement)
2. **Active infection**
3. **Restricted foot and ankle blood supply** (>50% lower limb arterial stenosis on ultrasound)
4. **Any inclination in ankle axis >5 degrees**
5. **Bipolar lesions** (cysts in talus medial and lateral simultaneously or talar and tibia cysts simultaneously)
6. **Early osteoarthritic changes** (tibial or talus anterior or posterior osteophytes or sclerosis of the joint).

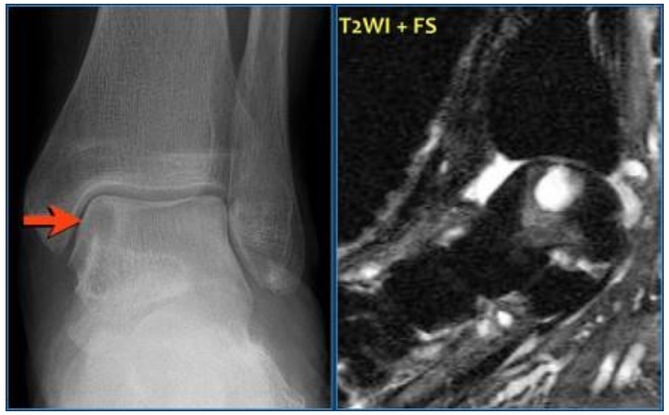
Materials & Methods

- **Preoperative** ankle **radiographs**, **CT** and **MRI** scans were obtained.









Clinical Evaluation

AOFAS score	
>90	excellent
84-90	good
65-83	fair
<65	poor

- Pre- & Post-operatively used:
  - **VAS** for pain,
  - ankle **ROM**,
  - **American Orthopaedic Foot and Ankle Society** (AOFAS)
  - **Foot & Ankle Disability Index** (FADI) scores

performed at **1- and 2-years** following surgery (Aver. 3y, range; 1-5 years).

The first 22 cases underwent second-look arthroscopy to evaluate chondral coverage at 9 to 12 months after the initial operation.

Surgical Technique

(1) chevron medial or lateral malleolar osteotomy,

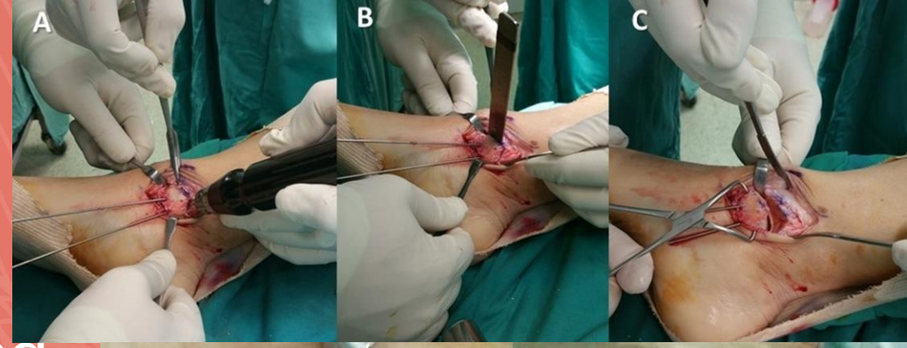
(2) excision of the necrotic sequestrum and curetting the crater to bleeding bone,

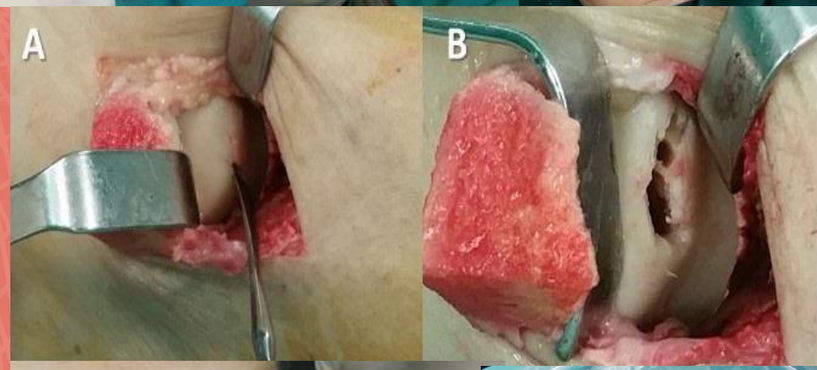
(3) autologous cancellous graft transferring from the proximal tibial metaphysis and

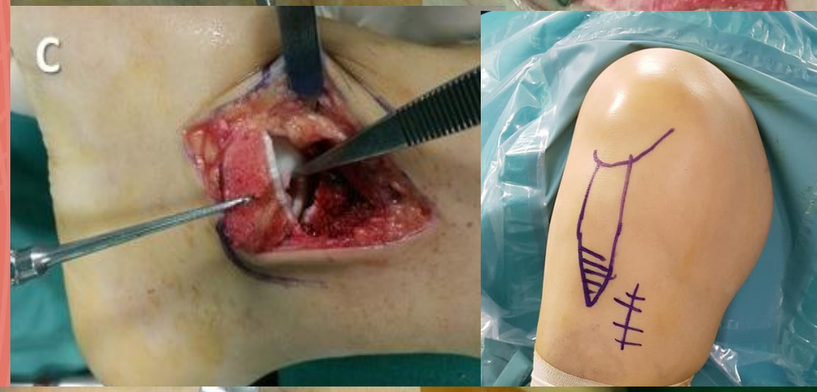
(4) tibia periosteum transfix over the talus lesion

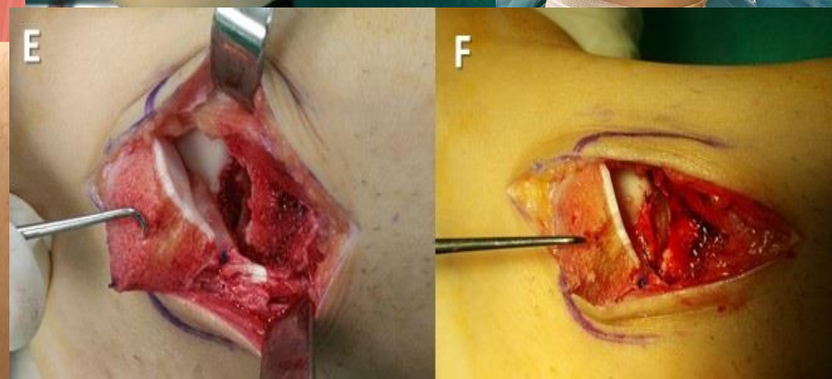
(5) reduction and internal fixation of the osteotomy.

The post-operative regime included a 1-month period of non-weight-bearing, following by partial weight bearing for the next 2 months.









Results

Significant improvements from 7.7 (95% CI {7.4, 8.0}) pre- to 1.1 (95% CI {1.0, 1.3}) at 1-year and 0.4 (95% CI {0.2, 0.6}) over 2 years post- (p<0,001).

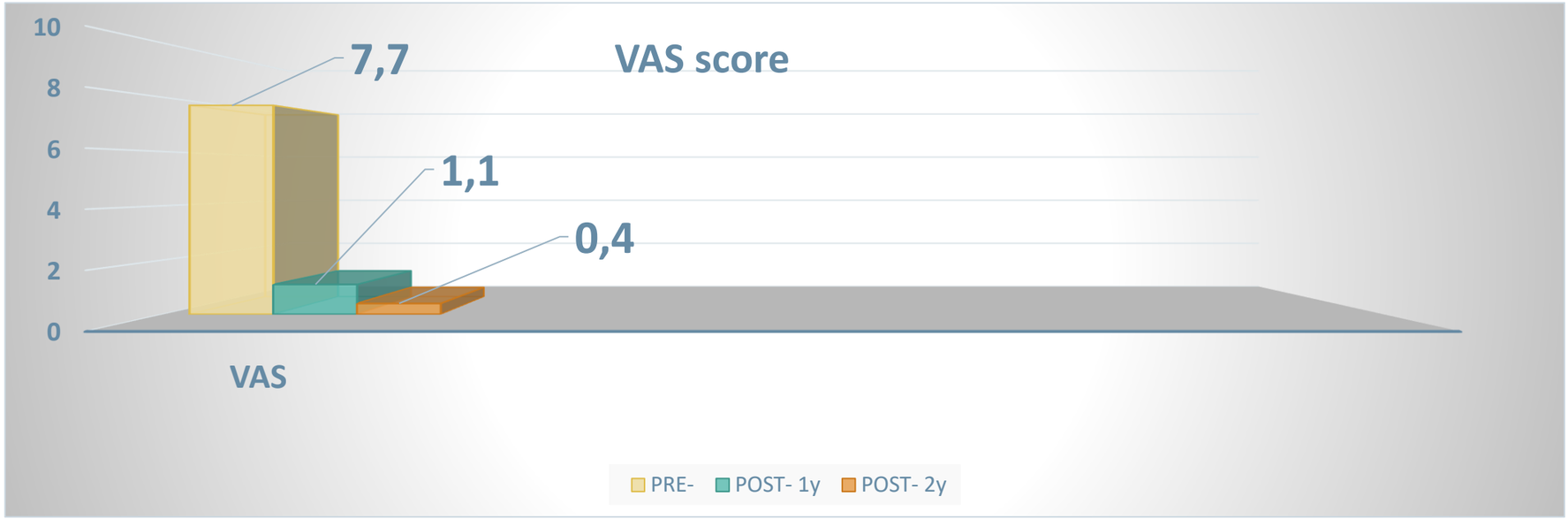


Table 2. VAS score patients' results and statistics.

VAS	*M*	*Mdn*	*Min*	*Max*	*Range*	*SD*	*Whole*[1]	*Post 6M Pre*[2]	*Post 1Y Pre*[2]	*Post 1Y Post 6M*[2]
pre	7.7	8.0	5	9	4	1.1	*P*<0.00	*P*<0.001	*P*<0.001	*P*<0.001
post 1Y	1.1	1.0	0	2	2	0.6	1	*z*=-5.652	*z*=-5.628	*z*=-4.187
post 2Y	0.4	0.0	0	2	2	0.6	$\chi^2(2)=73.316$			

[1]: Friedman's ANOVA
[2]: Wilcoxon signed-rank test

Results

Table 3. ROM patients' results and statistics.

ROM	*M*	*Mdn*	*Min*	*Max*	*Range*	*SD*	*Post 6M Pre*[1]
pre	24.5	25.0	10	35	25	7.0	$P<0.001$
post 1Y	58.3	60.0	50	65	15	4.6	$z=-5.614$

[1]: Wilcoxon signed-rank test

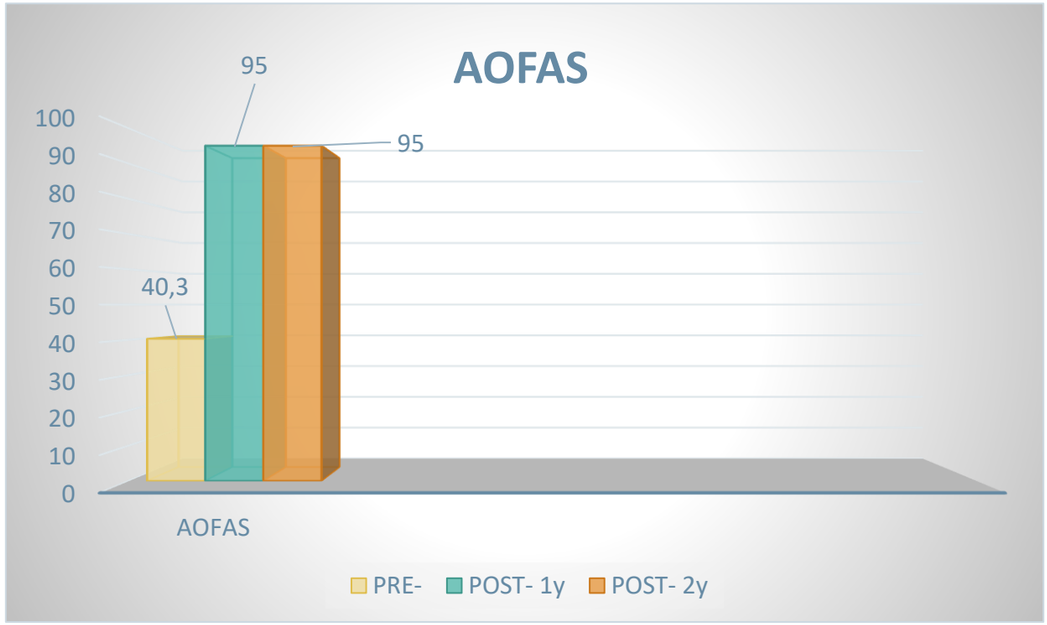
The AOFAS score was significantly improved from **40.3** (95%CI {36.8, 43.8}) pre- to **95** (95% CI {93.5, 96.7}) postoperatively in **1 year**, and **95** (95% CI {93.5, 96.6}) post- over **2 years** (p<0,001).

Table 4. AOFAS score patients' results and statistics.

AOFAS	*M*	*Mdn*	*Min*	*Max*	*Range*	*SD*	*Whole*[1]	*Post 1Y Pre*[2]	*Post 2Y Pre*[2]	*Post 2Y Post 1Y*[2]
pre	40.3	46.0	18	55	37	11.1	*P*<0.001	*P*<0.00	*P*<0.001	*P*=1.000
post 1Y	95.0	96.0	85	100	15	5.1	$\chi^2(2)$=68.	1	*z*=-5.581	*z*=0.000
post 2Y	95.0	96.0	85	100	15	4.9	162	*z*=-5.581		

[1]: Friedman's ANOVA
[2]: Wilcoxon signed-rank test

Results



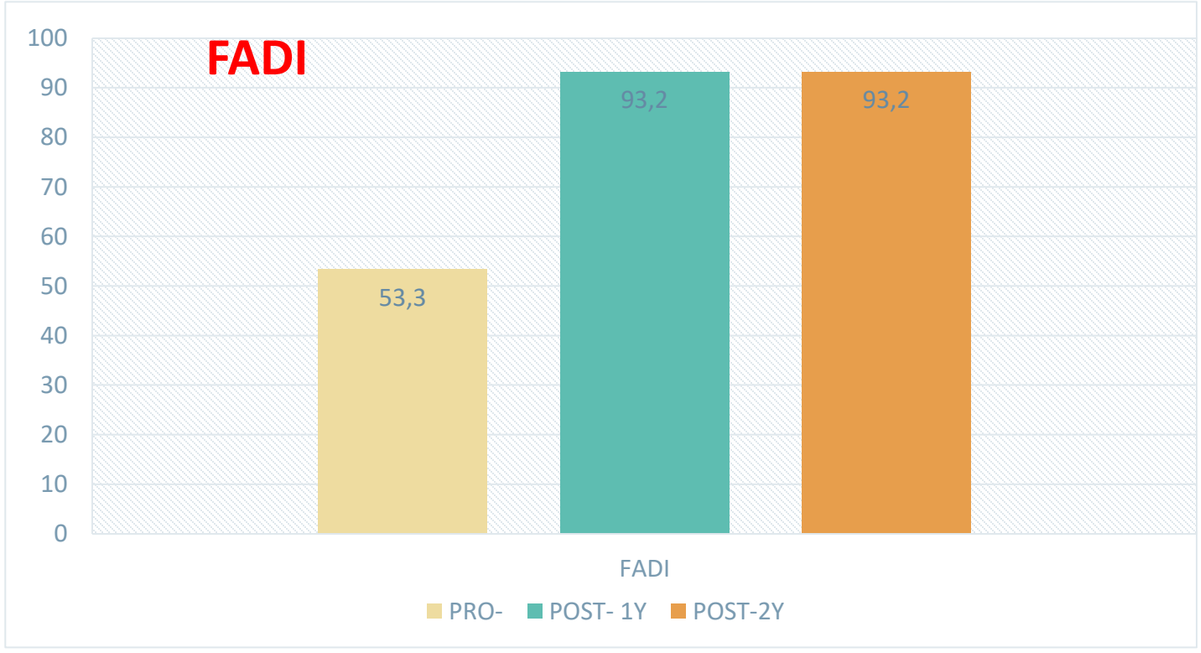
FADI score was significantly improved from 53.3 (95% CI {51.3, 55.3}) pre- to 93.2 (95% CI {92.3, 94.3}) post- in 1 year, and 93.2 (95% CI {92.3, 94.3}) post- over 2 years (p<0,001).

Table 5. FADI score patients' results and statistics.

FADI	*M*	*Mdn*	*Min*	*Max*	*Range*	*SD*	*Whole*[1]	*Post 1Y Pre*[2]	*Post 2Y Pre*[2]	*Post 2Y Post 1Y*[2]
pre	53.3	52.9	44	63	18	6.4	*P*<0.001	*P*<0.001	*P*<0.001	*P*<0.001
post 1Y	93.2	92.3	89	99	10	3.2	$\chi^2(2)=73.101$	*z*=-5.582	*z*=-5.582	*z*=-0.201
post 2Y	93.3	92.3	89	99	10	3.0				

[1]: Friedman's ANOVA
[2]: Wilcoxon signed-rank test

Results



Conclusion

Autologous cancellous graft transplantation with periosteum is a very promising surgical procedure to treat large osteochondral lesions of the ankle joint.

Article

AMERICAN ORTHOPAEDIC FOOT & ANKLE SOCIETY

Foot & Ankle Orthopaedics
2019, Vol. 4(3) 1-11
© The Author(s) 2019
DOI: 10.1177/2473011419874039
journals.sagepub.com/home/fao

Large Osteochondral Lesions of the Talus Treated With Autologous Bone Graft and Periosteum Transfer

Dimitrios Nikolopoulos, PhD[1,2], Neoptolemos Sergides, MD[1,2], George Safos, MD[1,2], Konstantinos Moustakas, MD[1,2], Petros Safos, MD[3], and Andreas Moutsios-Rentzos, MD, PhD[4]

Abstract

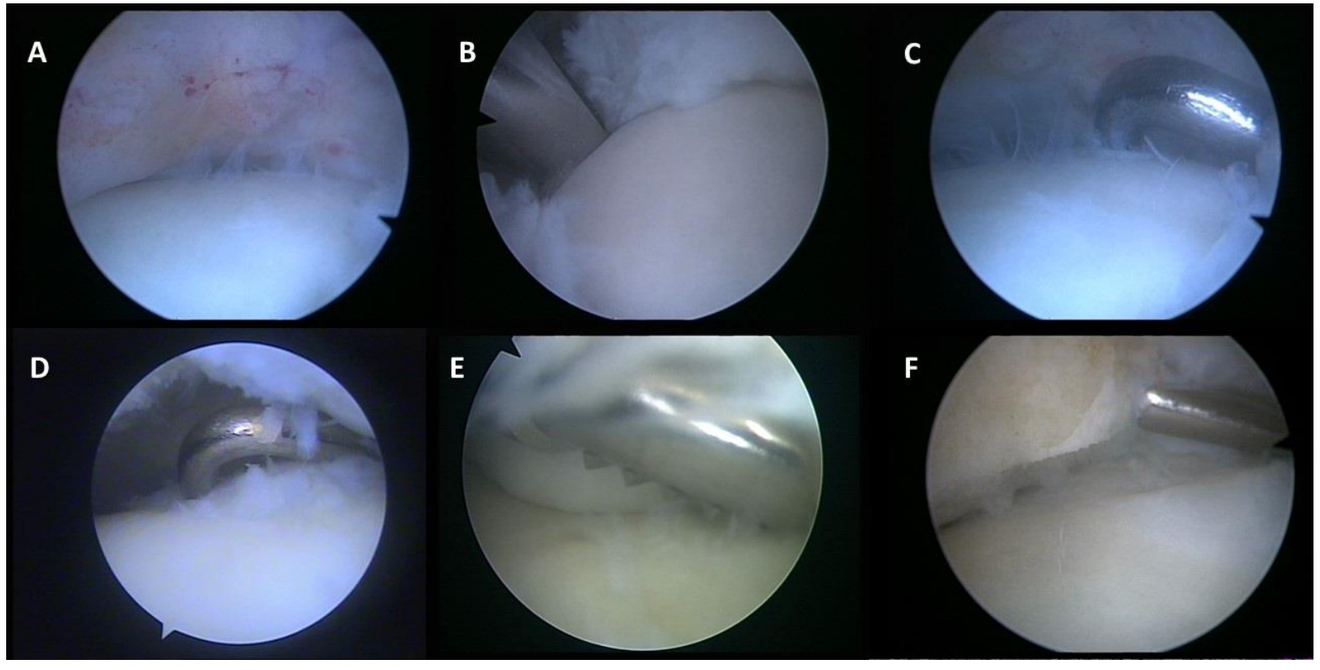
Background: The treatment of large osteochondral lesions of the talus (OLTs) is challenging due to the poor intrinsic reparative capability of the damaged articular cartilage. Autologous transfer of bone and periosteum has been used successfully in the treatment of large defects in animals, and therefore it was believed that this technique might show similar results in humans. The purpose of this study was to assess the outcome of an innovative technique for autologous transplantation of cancellous tibial graft with periosteal transfer in large OLTs.

Methods: Forty-one patients (22 females, 19 males), with a mean age of 34.9 years (range, 18-72 years), with a large OLT (>200 mm^2) were treated with autologous bone graft and periosteum transfer. OLTs averaging 310 mm^2 were identified on a preoperative computed tomography scan. The procedure consisted of malleolar osteotomy, curettage of sclerotic bone, autologous bone graft from the proximal tibia, and transfixion of periosteum over the graft. Outcome measures, including the pain visual analog scale (VAS), ankle range of motion (ROM), American Orthopaedic Foot & Ankle Society (AOFAS) score, and Foot & Ankle Disability Index (FADI), were compared between preoperative and 1 and 2 years following surgery.

Results: There were significant improvements in VAS pain score from 7.7 before surgery to 1.1 at 1 year after surgery and 0.4 at 2 years or more after surgery. The AOFAS and FADI scores were also significantly improved from 40.3 and 53.3 preoperatively to 95 and 93.2 postoperatively at 1 year and 95 and 93.2 at 2 or more years postoperatively, respectively. Postoperative complications included 2 patients who required removal of medial malleolar osteotomy tension bands due to symptomatic hardware. There were no nonunions or malunions of the osteotomies and no donor site complications.

Conclusion: Autologous bone graft and periosteum transfer was an effective treatment for large OLTs leading to significant decreases in pain and improvement in functional scores at more than 2 years after surgery.

Level of Evidence: Level IV, retrospective case series.



ISAKOS CONGRESS 2023 | Boston Massachusetts June 18–June 21