ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Outcome of Patellar Tendinopathy Treatment Using Ultrasound-guided Galvanic Electrolysis Technique (USGET) Combined with an Eccentric Exercise Regimen: Clinical Findings.

Presenter: Federico Ibañez, MD.

Parc Sanitari Sant Joan de Dèu - Barcelona

Contact: drfedericoibanez@gmail.com

Co-Authors: Ferran Abat, Jordi Torras, Gabriel Planells

ReSport Clinic Barcelona - Spain

SJD Sant Joan de Déu Parc Sanitari

CLINIC ReSport TRAUMATOLOGIA ESPORTIVA

Faculty Disclosure Information

- Nothing to disclosure.

How do we deal with tendinopathies?

Analgesics? NSAIDs?

Rest + cryotherapy?

Eccentric exercises? →

Shock wave therapy?

PRP?

Surgery?

Robust evidence for its effect upon several regional tendinopathies

Curwin & Stanish (1984)
Alfredson et al (1998, 2001, 2003, 2004, 2004)
Cannell et al (2001),
Young et al (2005),
Bahr et al (2006),
Frohm et al (2007)

Mechanobiology and mechanotransduction

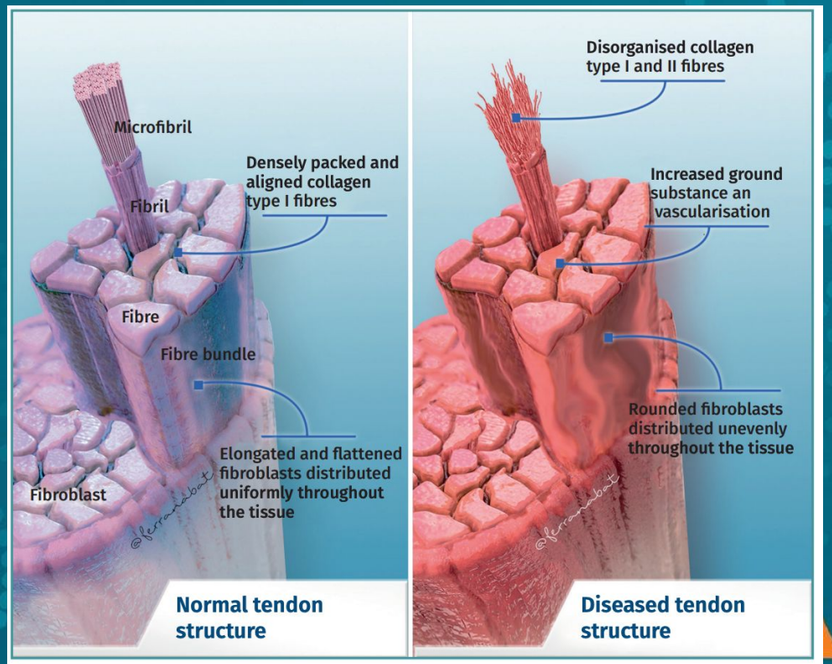


Figure 1. *Structure of the normal and the injured tendon.*

Abat, F. et al. Rev Esp Artrosc Cir Articul En. 2022;29(1):3-12

What else can be done?

It has been reported that electrical stimulation can induce an inflammatory process that helps tissue regeneration.

Gravante et al. 2010 Gardner et al. 1999 Zhao et al. 2004 Yang et al. 2009

What is **electrolysis**?

non-thermal electrolytic ablation that induces a controlled inflammatory response, allowing the activation of cellular mechanisms involved in phagocytosis and the regeneration of damaged soft tissue

2013 Investigate the molecular mechanisms of tissue response after treatment in **collagenase-induced tendinopathy in rats.**

Rev Esp Cir Ortop Traumatol. 2014;58(4):201–205

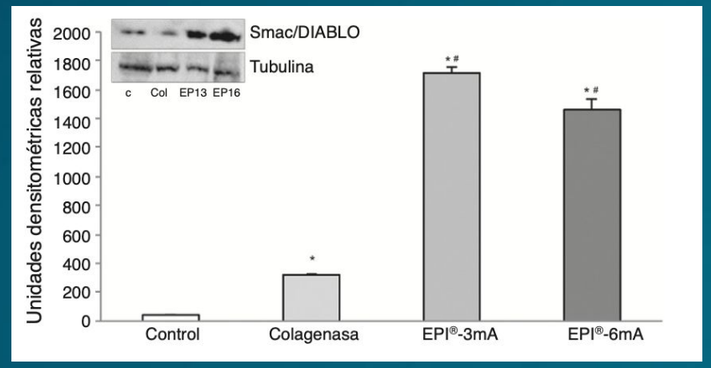
Revista Española de Cirugía Ortopédica y Traumatología

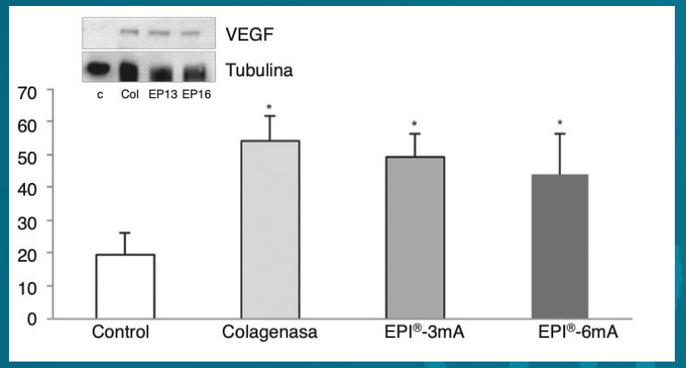
www.elsevier.es/rot

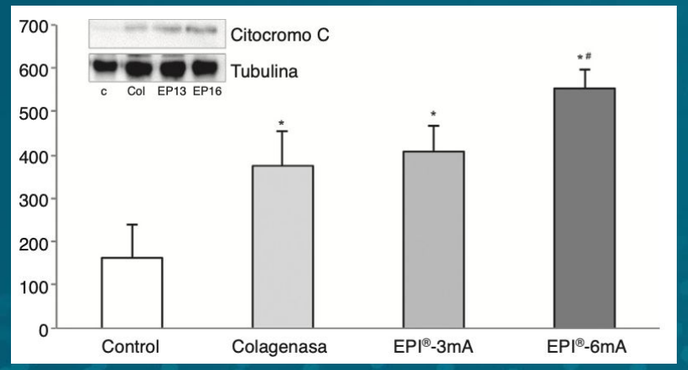
RESEARCH

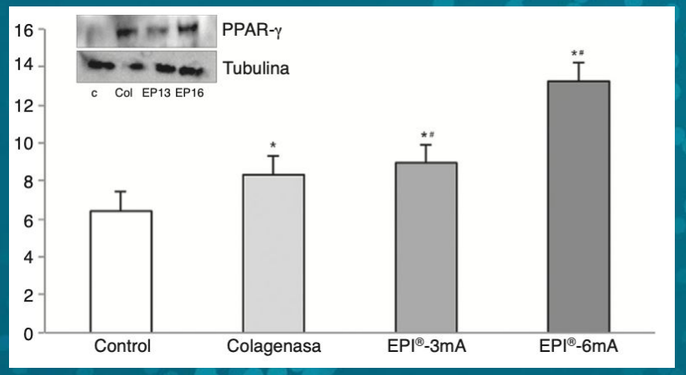
Molecular repair mechanisms using the Intratissue Percutaneous Electrolysis technique in patellar tendonitis☆

F. Abat[a,*], S.L. Valles[b], P.E. Gelber[c,d], F. Polidori[a], T.P. Stitik[e], S. García-Herreros[b], J.C. Monllau[c,d], J.M. Sanchez-Ibánez[a]









A statistically significant **increase**, compared to the control group, was observed in the expression of **cytochrome C, Smac/Diablo, vascular endothelial growth factor, its receptor 2 and peroxisome proliferator-activated receptor gamma** in the groups in which the electrolysis was applied.

ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Methods

Prospective study

51 athlete-patients

Age range 17-60 (35.6 y.o average)

2019-2021

Patellar insertional tendinopathy → ultrasound-guided galvanic electrolysis technique (USGET) + Rehab protocol

2.5 years follow - up

Inclusion /Exclusion criteria

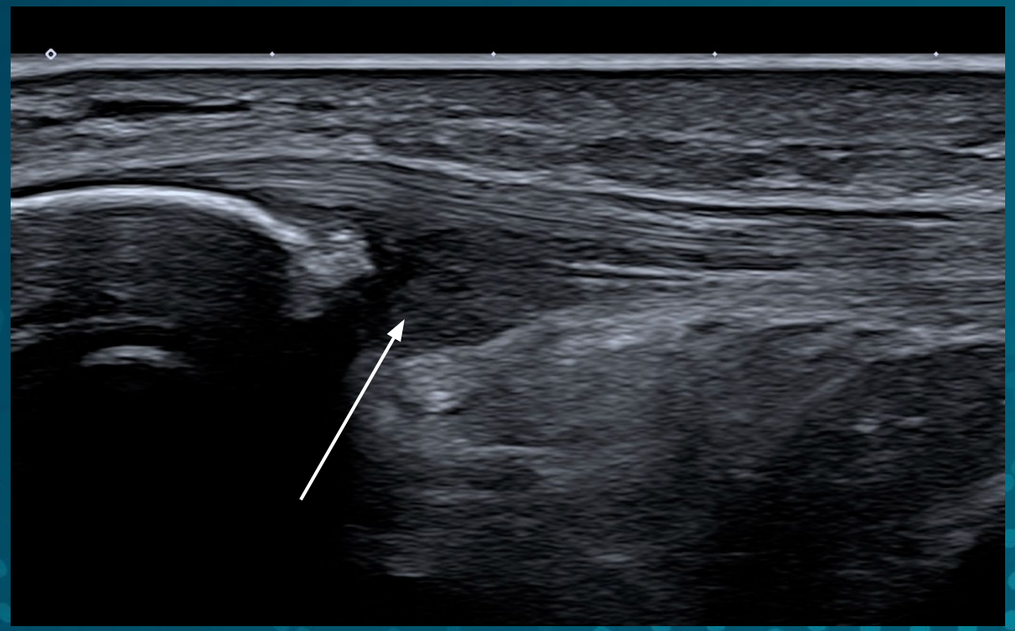
- pain in the lower insertional pole of the patella
- pain for a minimum of 4 weeks
- Agree to stop participating in their sport (while specific rehab is done)
- >18 / < 60 years old.

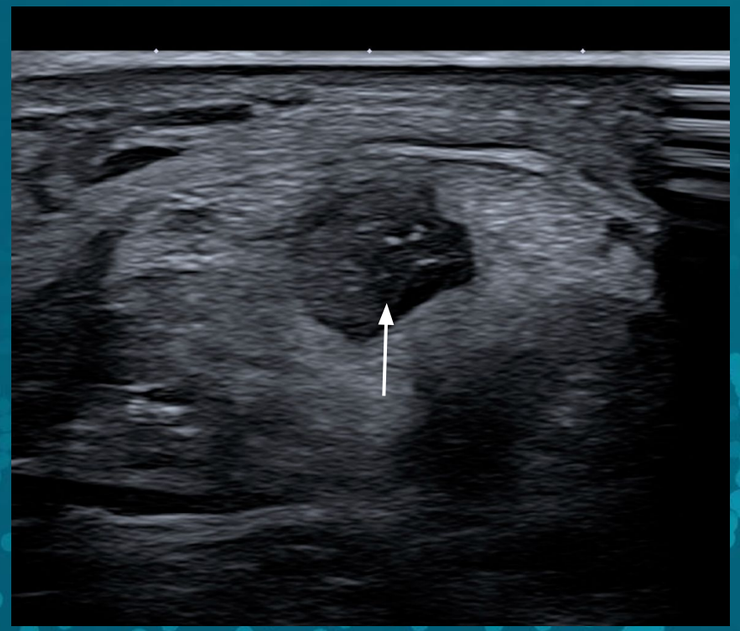
- Chronic arthropathy
- Another associated knee injury (such as a ACL, PCL, meniscus)

No use of Anti-inflammatory drugs or corticosteroids during treatment

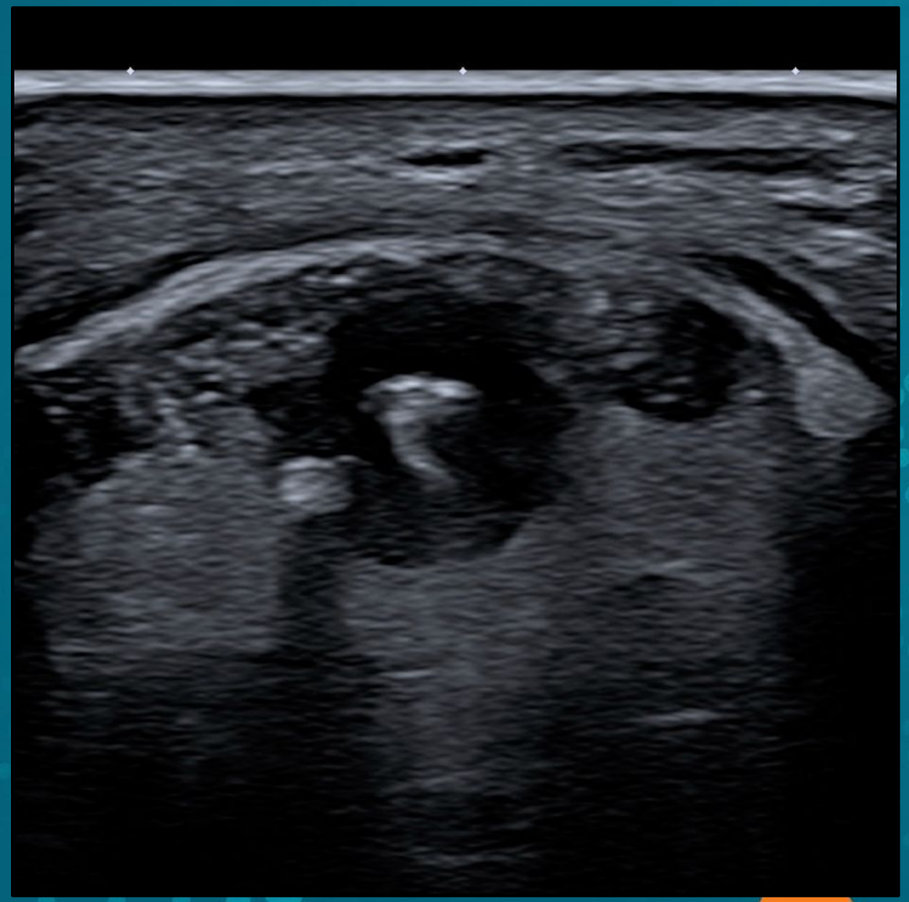
Diagnosis:

- Clinical assessment of patellar tendinopathy
- Ultrasound examination (linear probe with a frequency range of 6-15MHz.)





Treatment:



Electrolysis treatment:

one clinic team

same ultrasound assisted technique

1 session, every 2 weeks

Until clinical improvement, or

no improvement in the symptomatology seen after 10 sessions.

ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Rehab treatment protocol:

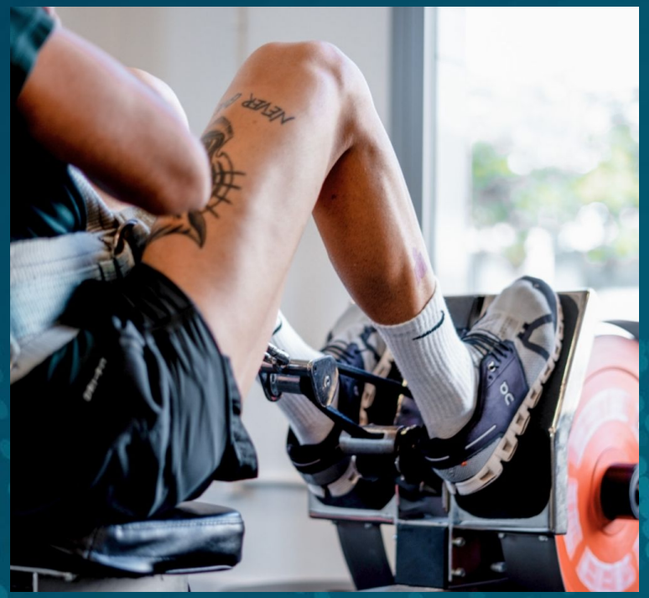
same team of physiotherapists

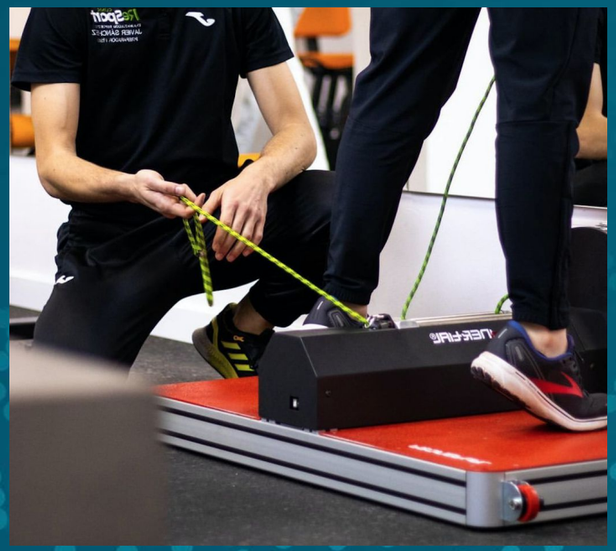
same exercise protocols and load progressions

2 weekly sessions

combination of eccentric exercises

using resistance isoinertial devices





Functional assessments

basal, 1st m, 3rd m, 6th m, 1st y, 2nd y, 3rd y

IKDC, Kujala, Tegner, Visual Analogue Pain Scale (VAS), Satisfaction Rate, and VISA-P questionnaire.

Statistical analysis

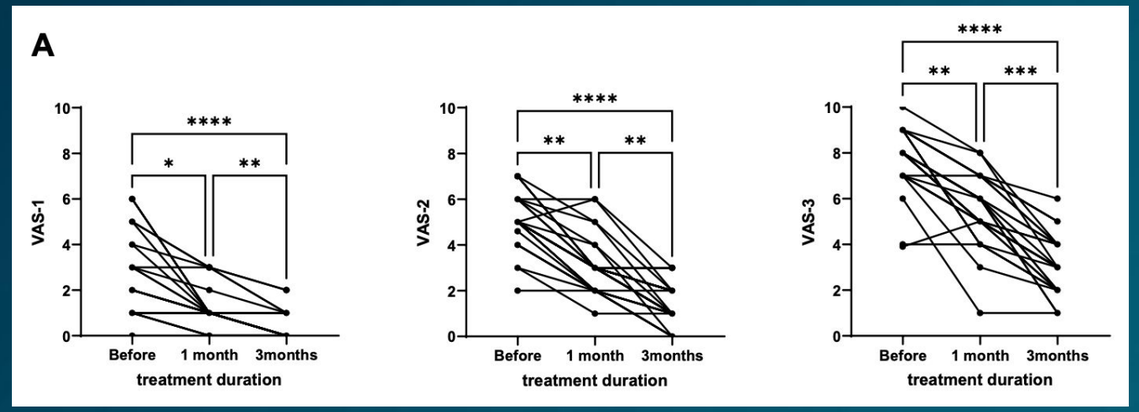
P value< set at 0.05

Fisher's exact test, Chi-square test, ANOVA

SPSS v.18 (SPSS Inc., Chicago, Illinois)

Results:

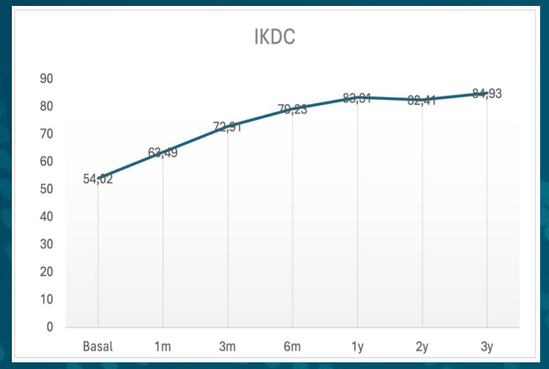
The average electrolysis treatment duration was 6 weeks, with highest improvement in this period.



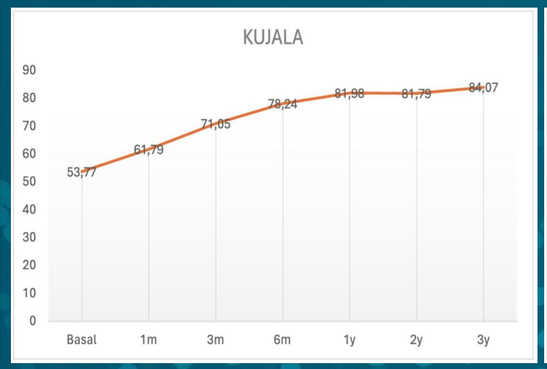
VAS-1: rest VAS-2: daily activities VAS-3: sports

By the end of the treatment, more than 80% of the patients had successfully returned to their pre-injury level of physical activity, which kept increasing at the 2.5 year mark.

A remarkably average improvement of every scale was achieved.

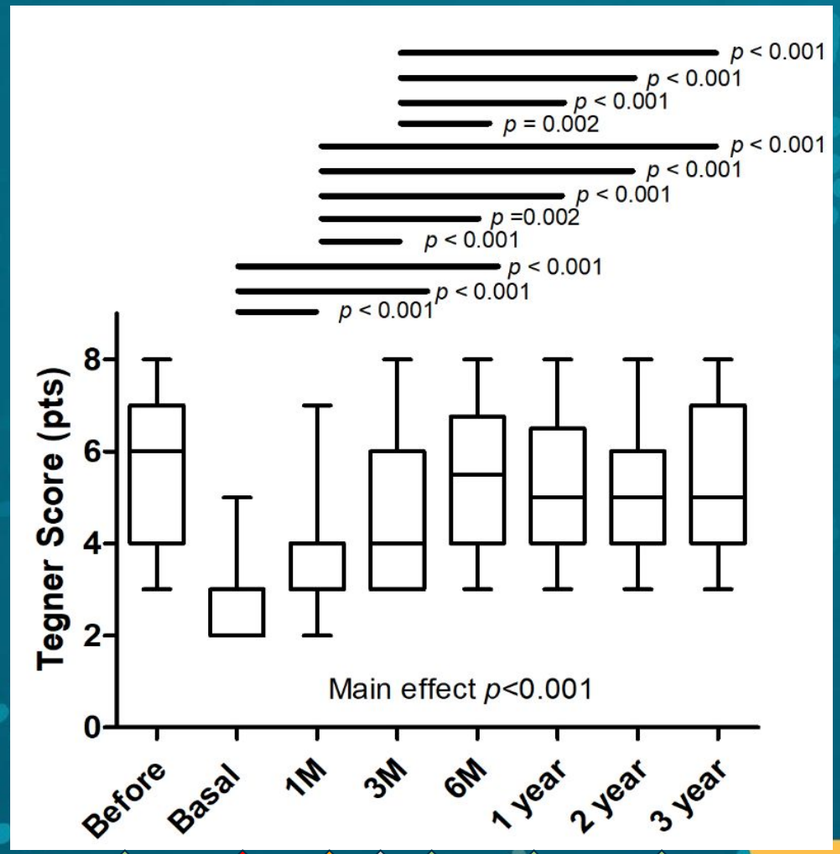


Basal	1m	3m	6m	1y	2y	3y
54,02	63,49	72,91	79,23	83,31	82,41	84,93



Basal	1m	3m	6m	1y	2y	3y
53,77	61,79	71,05	78,24	81,98	81,79	84,07

Basal	1m	3m	6m	1y	2y	3y
51,7	63,3	73,1	79,9	83,1	81,2	83,9



ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Limitations

- No classification group by sport / demanding
- Widespread age range 17-60 y.o.
- The main limitation of this study is focused on combining Ultrasound-guided Galvanic Electrolysis Technique (USGET) with eccentric exercise

- No control groups

Take home message

Exercise/tension is highly recommended in tendinopathies.
→ Mechanotransduction (tensile tension to the tenocytes)

The combination of USGET with an eccentric-based rehabilitation program leads to excellent clinical and functional improvements in patellar tendon health within a long-term period and with minimal morbidity.

It is safe and effective for treatment of Patellar tendinopathy

References

Abat, F, Gelber, P. Polidori, F. Monllau, JC, Sanchez-Ibañez, J. Clinical results after ultrasound-guided intratissue percutaneous electrolysis (EPIÒ) and eccentric exercise in the treatment of patellar tendinopathy. Knee Surg Sports Traumatol Arthrosc DOI 10.1007/s00167-014-2855-2

Abat F, Valles Sl, Gelber pe, polidori f, Jorda a, Garcia-herreros S, et al. an experimental study of muscular injury repair in a mouse model of notexin-induced lesion with epi® technique. BMc Sports Sci Med rehabil 2015;7:7

Augustyn, D. et al. The effectiveness of intratissue percutaneous electrolysis for the treatment of tendinopathy: a systematic review. S Afr J Sports Med 2022;34:1-8. DOI: 10.17159/2078-516X/2022/v34i1a12754

Bahr R, Fossan B, Løken S, Engebretsen L. Surgical treat- ment compared with eccentric training for patellar tendinopa- thy (Jumper's Knee). A randomized, controlled trial. J Bone Joint Surg Am. 2006;88(8):1689-1698.

Bunker dlJ, ille Vi, ille Vl, nicklin S. Tendon to bone healing and its implications for surgery. Muscles ligaments Tendons J 2014;4:343- 50.

Loppini M, Maffulli N. Conservative management of tendinopa- thy: an evidence-based approach. Muscles Ligaments Ten- dons J. 2012;1(4):134-137

Moreno, C. et al. intratissue percutaneous electolysis combined with active physical therapy for the treatment of adductor longus enthesopathy-related groin pain: a randomized trial. The Journal of Sports Medicine and physical fitness 2017 october;57(10):1318-29

Padrón-Beníteza, A, et al. A comparative study between low and high intensity percutaneous needle electrolysis in patients with patellar tendinopathy: a structural and functional analysis. J Invasive Tech Phys Ther. 2016;1(1):10-17

Sanchez-Ibañez JM, colmena c, Benabent J, Garcia-herreros S, Valles Sl. new technique in tendon sport recovery. percutaneous electrolysis intratissue (epi®). int J phys Med rehabil 2013;1:113

Sanchez-Ibañez JM. Clinical course in the treatment of chron- ic patellar tendinopathy through ultrasound guided percuta- neous electrolysis intratissue (EPI®): study of a population se- ries of cases in sport [PhD. Thesis]. Universidad de Leon. Leon. Spain 2013

Sánchez- Sánchez JL. Comparative study of conventional physical therapy with one that includes Intratissue Percuta- neous Electrolysis ® technique in patients with chronic patellar tendinopathy [PhD. Thesis], Universidad de Salamanca. Sala- manca. Spain. 2011