



Polish
Arthroscopy
Society

Lesiones radiales. Qué son y cuándo las suturo



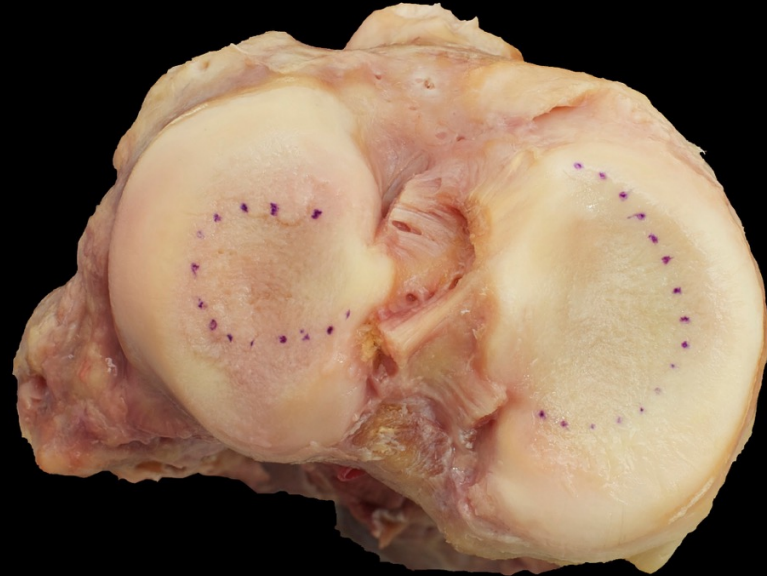
Sports Medicine
Lab
Poznan University of Medical Sciences



Tomasz Piontek



MM covers up to 50-60% of MTC
LM 75-80% of LTC

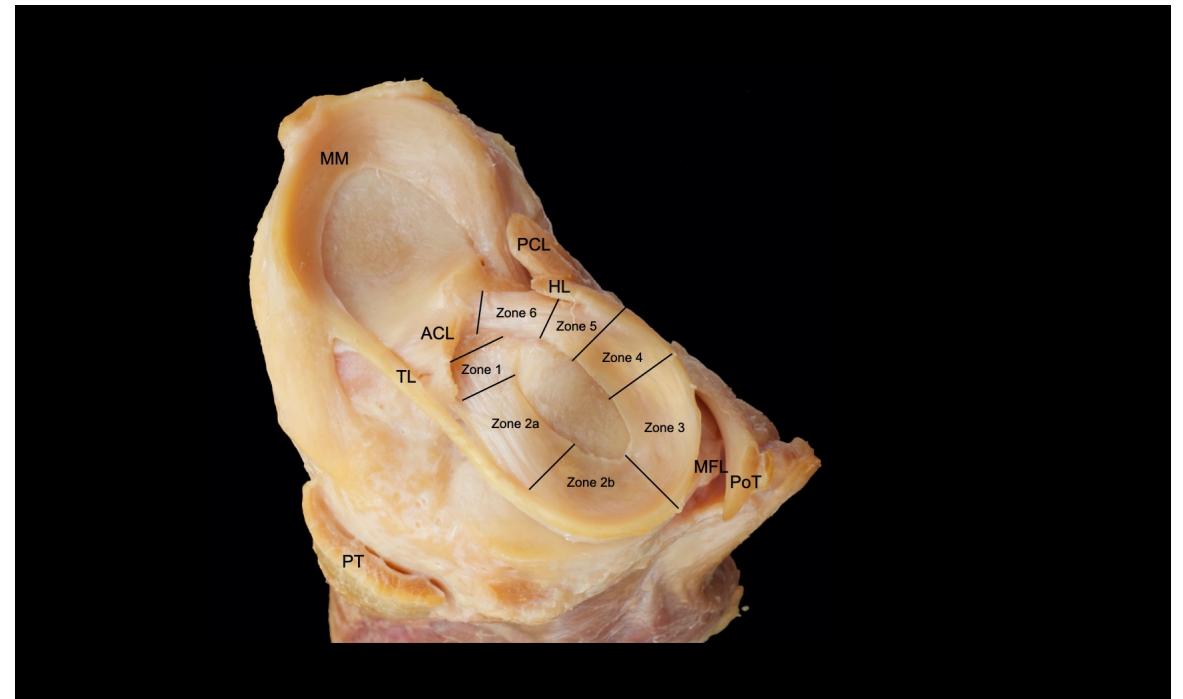
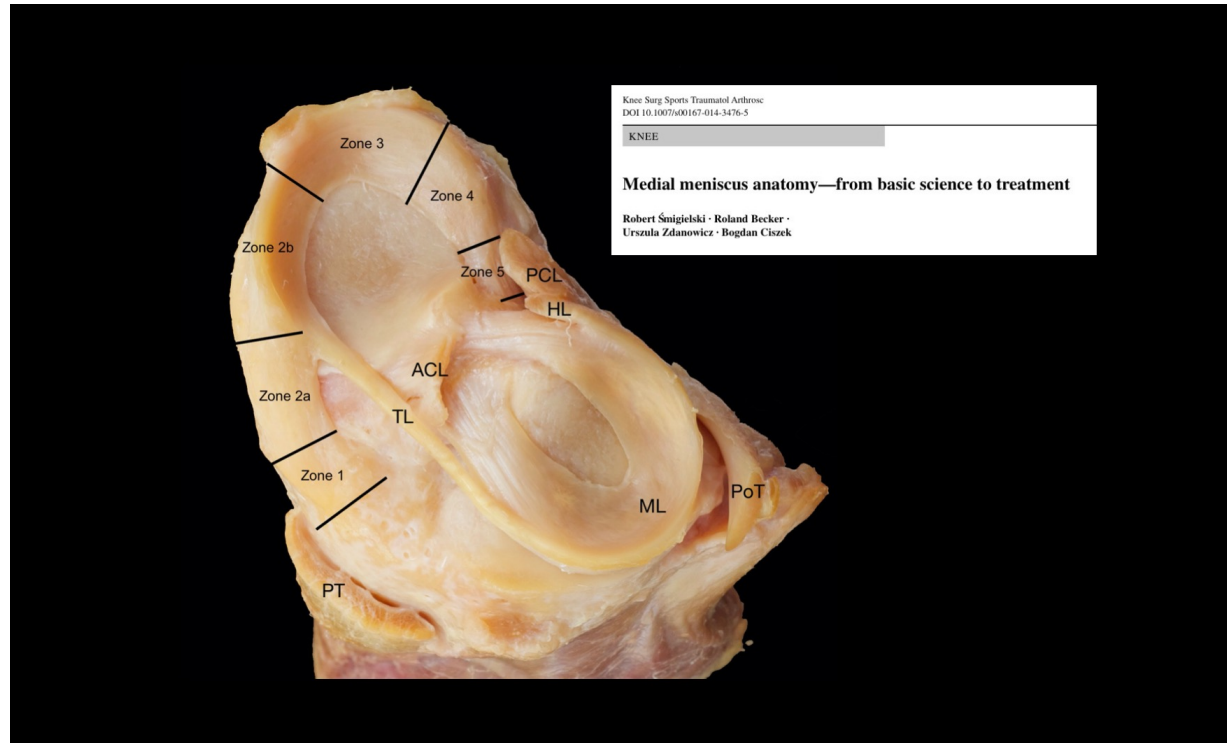


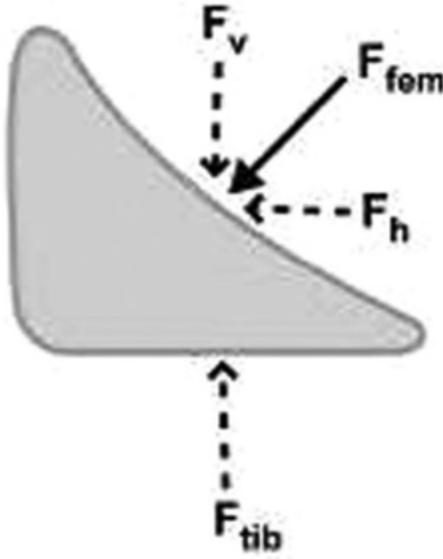
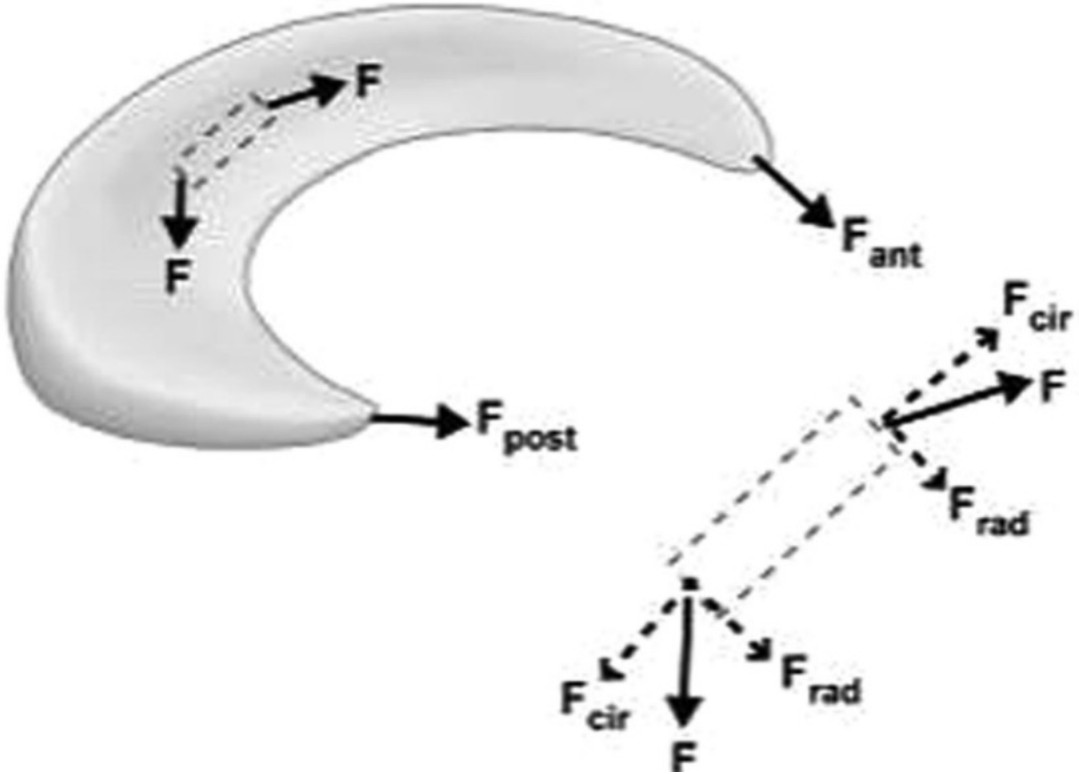
Knee Surg Sports Traumatol Arthrosc
DOI 10.1007/s00167-014-3476-5

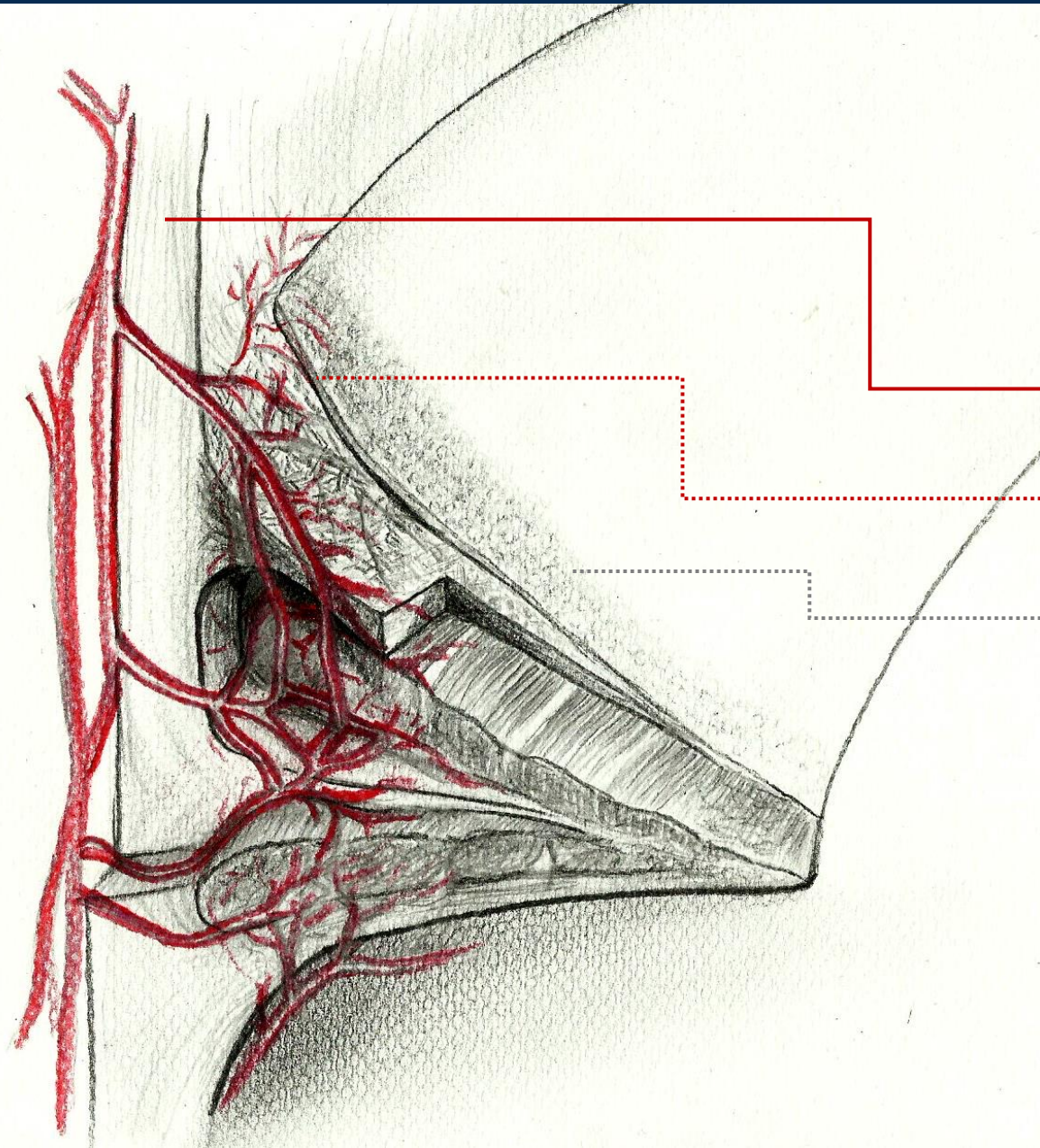
KNEE

Medial meniscus anatomy—from basic science to treatment

Robert Śmigielski · Roland Becker ·
Urszula Zdanowicz · Bogdan Ciszek







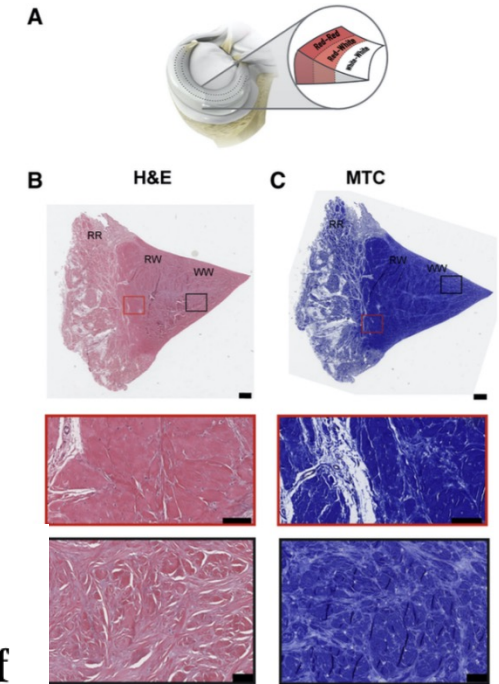
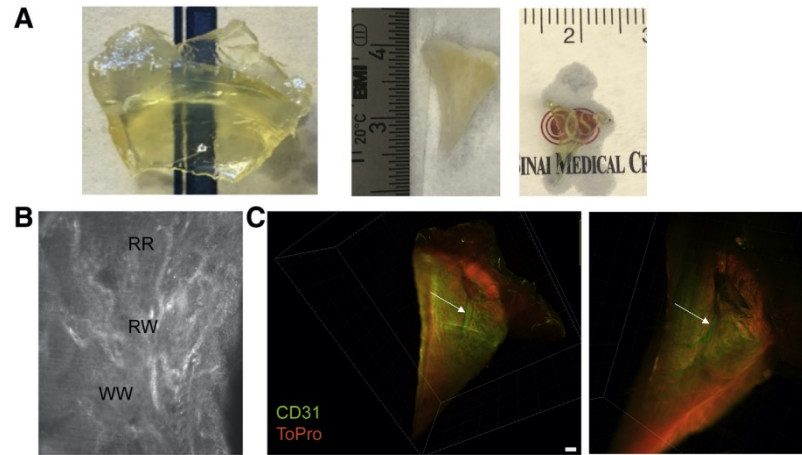
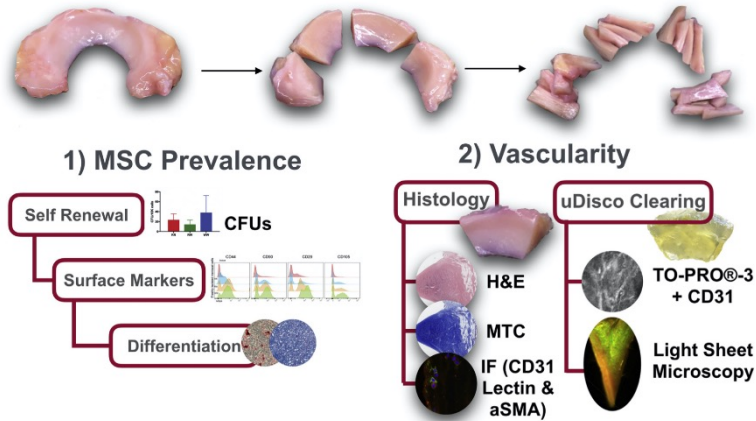
Zones:
red-red,
red-white,
white-white

Good results of simple meniscal suturing are possible in red-red zones.

Assessing the Resident Progenitor Cell Population and the Vascularity of the Adult Human Meniscus

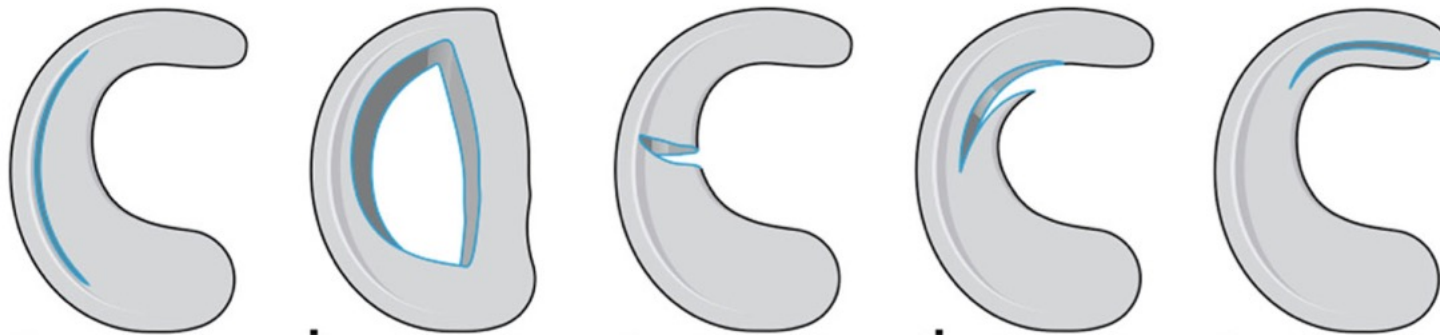
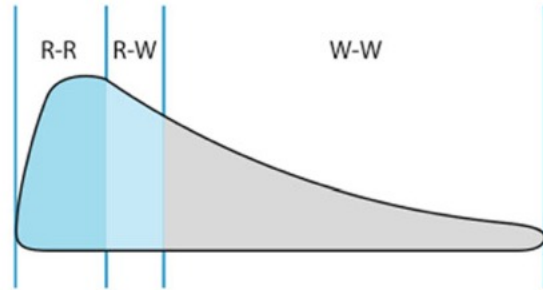
Jorge Chahla, M.D., Ph.D., Angela Papalamprou, Ph.D., Virginia Chan, B.S., Yasaman Arabi, B.S., Khosrawdad Salehi, B.S., Trevor J. Nelson, B.S., Orr Limpisvasti, M.D., Bert R. Mandelbaum, M.D., D.H.L., Wafa Tawackoli, Ph.D., Melodie F. Metzger, Ph.D., and Dmitriy Sheyn, Ph.D.

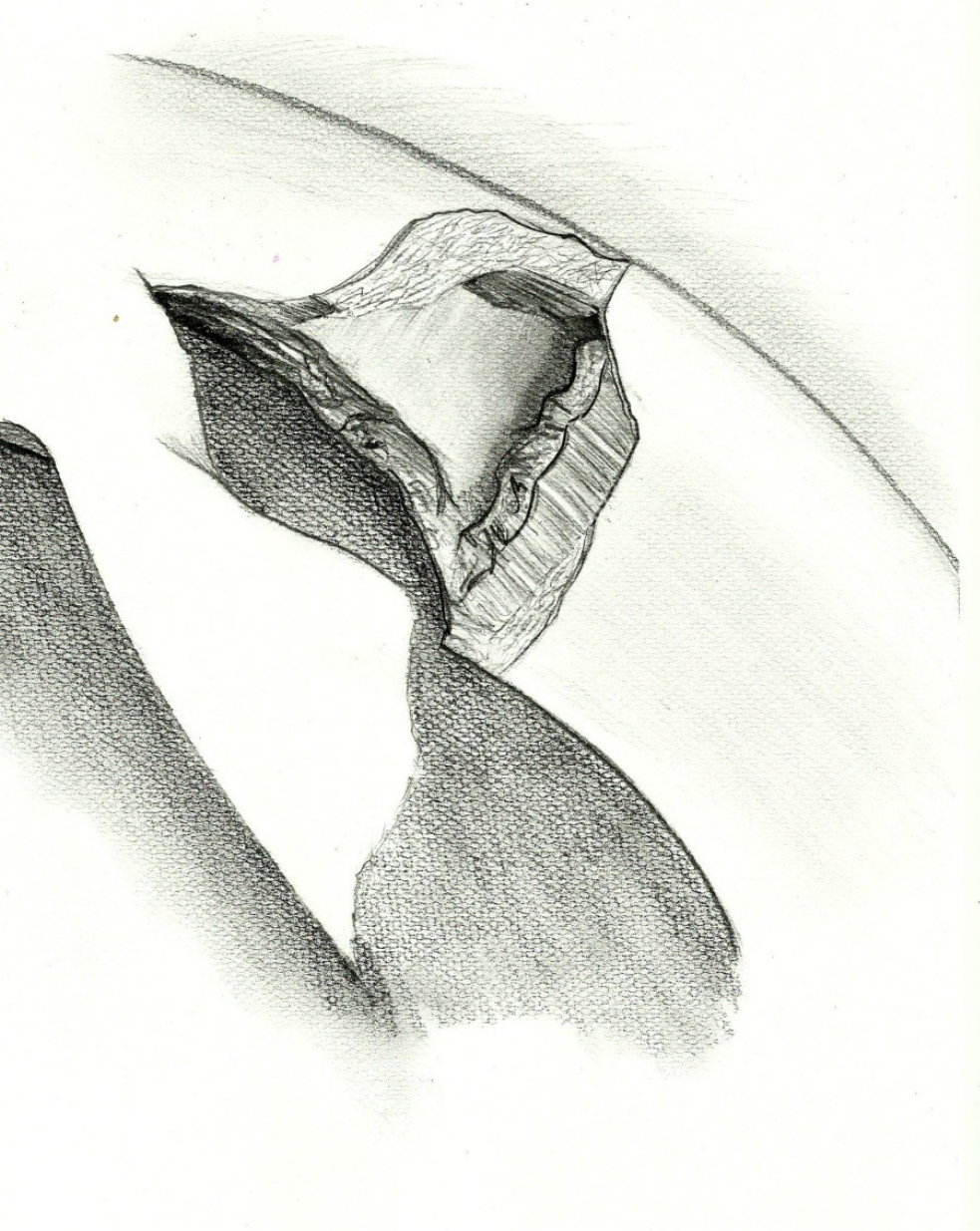
Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol ■, No ■ (Month), 2020: pp 1-14



Conclusions

In conclusion, our results demonstrate the presence of resident mesenchymal progenitors in all 3 meniscal zones of healthy adult donors without injury. In addition, our results demonstrate the presence of vascularization in the WW zone.





the most frequent tear patterns chronic:
vertical (16%),
discoid (14%),
bucket-handle (14%),
radial (10%), **48%**
horizontal (8%),
oblique (5%),
fray (3%), and
root detachment (2%)
complex (28%).

More arguments for meniscus preservation

Am J Sports Med. 2018 Jan;46(1):200-207. doi: 10.1177/0363546517737991. Epub 2017 Nov 7.

Meniscectomy and Resultant Articular Cartilage Lesions of the Knee Among Prospective National Football League Players: An Imaging and Performance Analysis.

Chahla J¹, Cinque ME¹, Godin JA², Sanchez G³, Lebus GF², Whalen JM⁴, Price MD^{4,5}, Kennedy NJ¹, Moatshe G^{2,6,7}, LaPrade RF^{1,2}, Provencher MT^{1,2}.



“Previous meniscectomy of **at least 10%** of total medial or lateral meniscus volume in prospective NFL players was significantly correlated with larger and more severe chondral lesions. Chondral and meniscal defects of the knee were found to result in a **significant decrease** in objective performance measures during a player's initial NFL career versus matched controls.”

Knee Surg Sports Traumatol Arthrosc
DOI 10.1007/s00167-018-4089-2

KNEE

The role of meniscal tissue in joint protection in early osteoarthritis

Rene Verdonk¹ · Henning Madry² · Nogah Shabshin^{3,4} · Florian Dirisamer⁵ · Giuseppe M. Peretti^{6,7} · Nicolas Pujd⁸ · Tim Spalding⁹ · Peter Verdonk¹⁰ · Romain Sei¹¹ · Vincenzo Condello¹² · Berardo Di Matteo¹³ · Johannes Zöllner¹⁴ · Peter Angele^{4,15}

The Role of the Meniscus in Knee Osteoarthritis: a Cause or Consequence?

Martin Englund, MD, PhD^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}, Ali Guermazi, MD¹, Stefan L. Lohmander, MD, PhD¹

KEYWORDS

• Osteoarthritis • Knee • Meniscus-menisci • Pain
• Symptoms • MR imaging • Radiography

Medial Meniscus Resection Increases and Medial Meniscus Repair Preserves Anterior Knee Laxity

A Cohort Study of 4497 Patients With Primary Anterior Cruciate Ligament Reconstruction

Riccardo Cristiani,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, Erik Rönnblad,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, Björn Engström,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, PhD, Magnus Forsblad,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, PhD, and Anders Ståhlman,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, PhD
Investigation performed at Capio Arthro Clinic/Stockholm Sports Trauma Research Center of Karolinska Institute, Stockholm, Sweden



“It is therefore strongly recommended to repair the meniscus whenever possible to avoid the residual postoperative laxity present in the meniscus-deficient knee.”

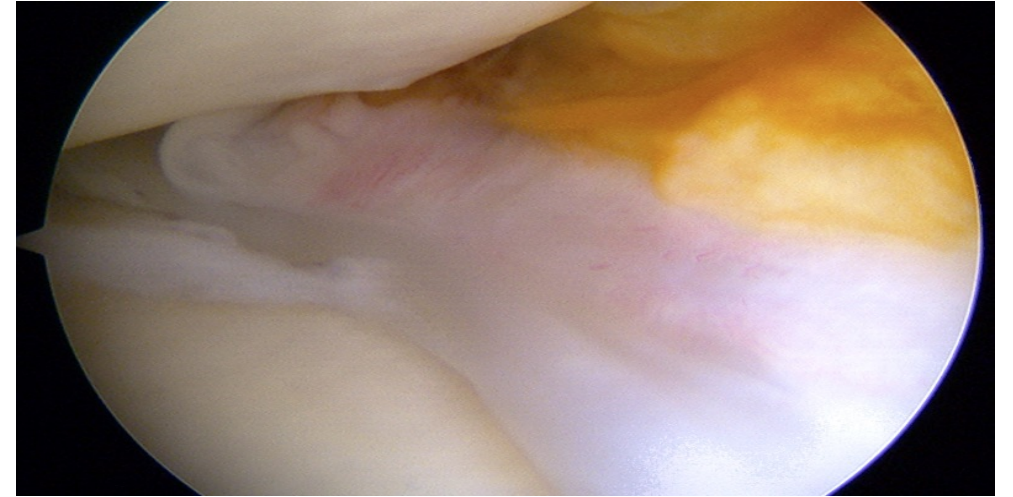
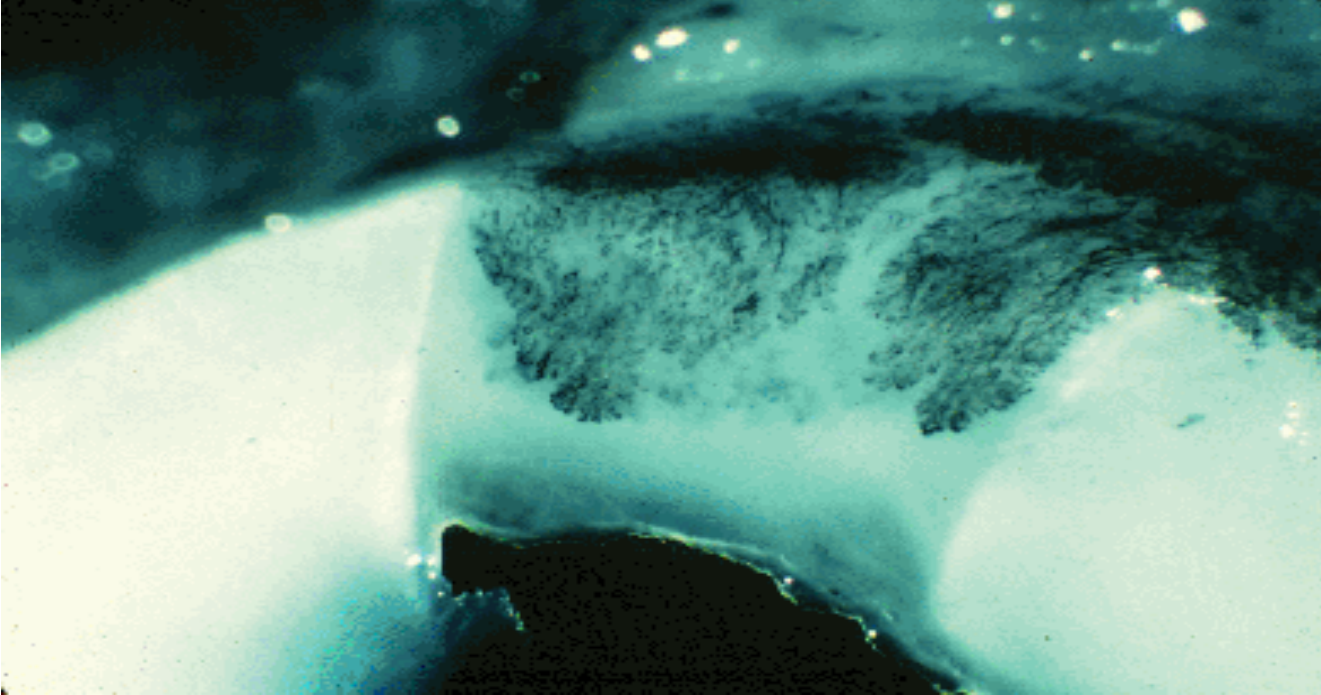
Er Radiol
DOI 10.1007/s00330-016-4361-z

MUSCULOSKELETAL

Partial meniscectomy is associated with increased risk of incident radiographic osteoarthritis and worsening cartilage damage in the following year

Frank W. Roemer,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, Kerri Kwoh,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, Michael J. Hannan,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, David J. Hunter,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, Felix Eckstein,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, Jason Grigg,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, Robert M. Boudreau,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, Martin Englund,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD, and Ali Guermazi,^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} MD

Most important for meniscus healing



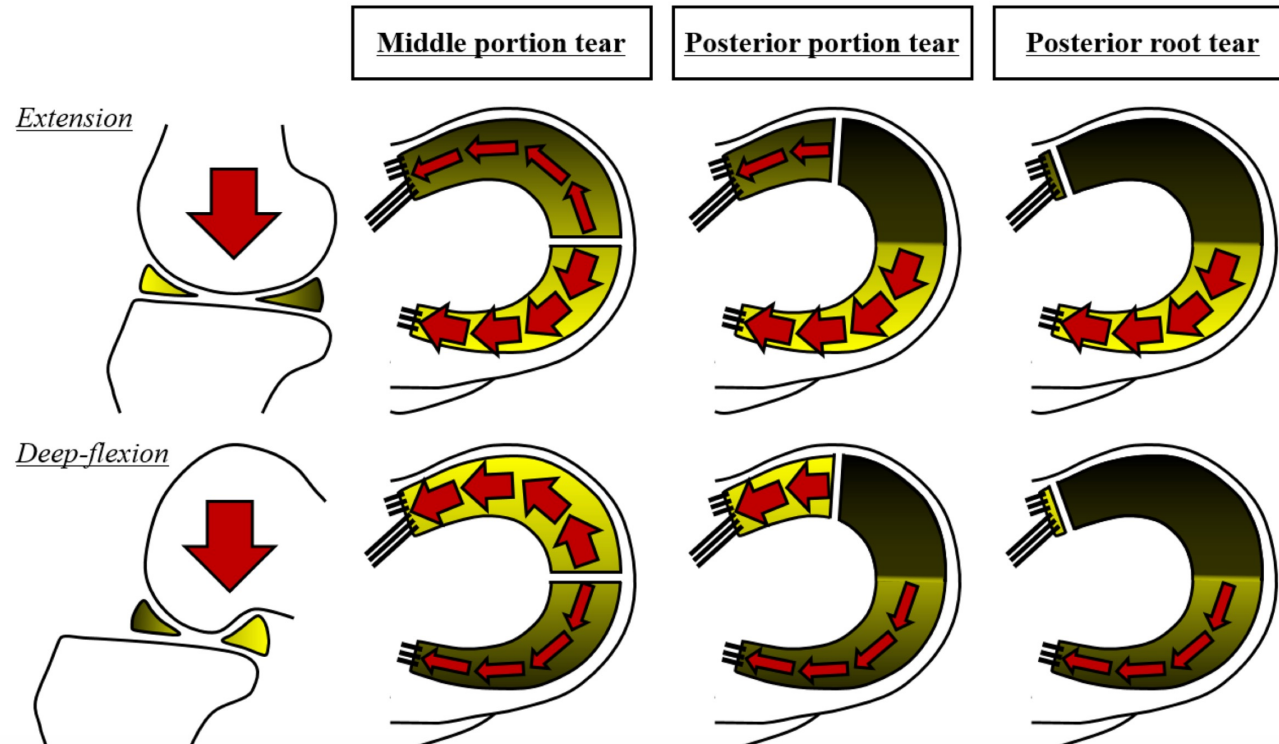
A meniscus 6 weeks following the creation of a radial lesion. The fibrovascular scar tissue has filled the defect, and vascular proliferation from the synovial fringe can be seen. (From Arnoczky SP, Warren RF. Microvasculature of the meniscus and its response to injury: an experimental study in the dog. *Am J Sports Med.* 1983;11:131; with permission.)



Different effects of the lateral meniscus complete radial tear on the load distribution and transmission functions depending on the tear site

Tomoki Ohori¹ · Tatsuo Mae¹ · Konsei Shino² · Hiromichi Fujie³ · Takehito Hirose¹ · Yuta Tachibana⁴ · Hideki Yoshikawa¹ · Ken Nakata⁵

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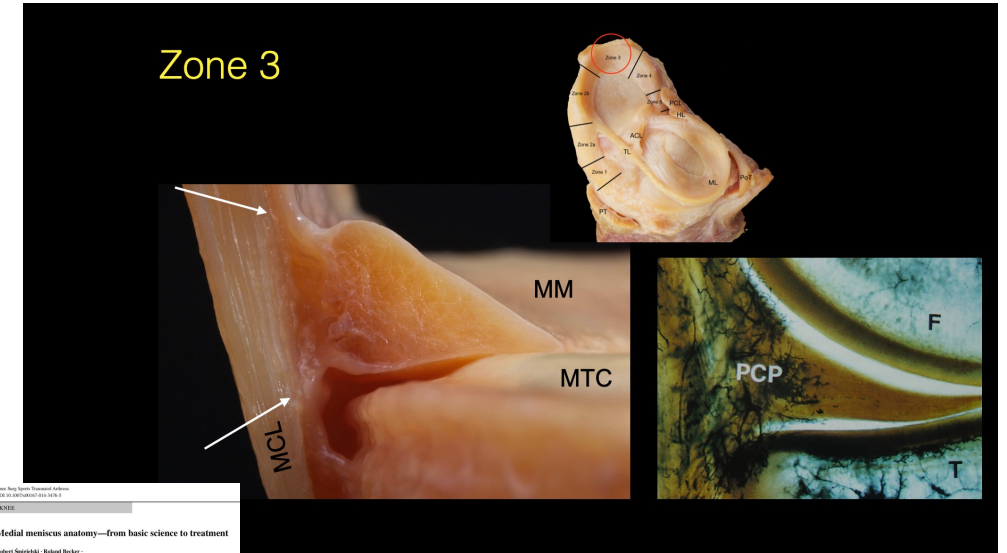
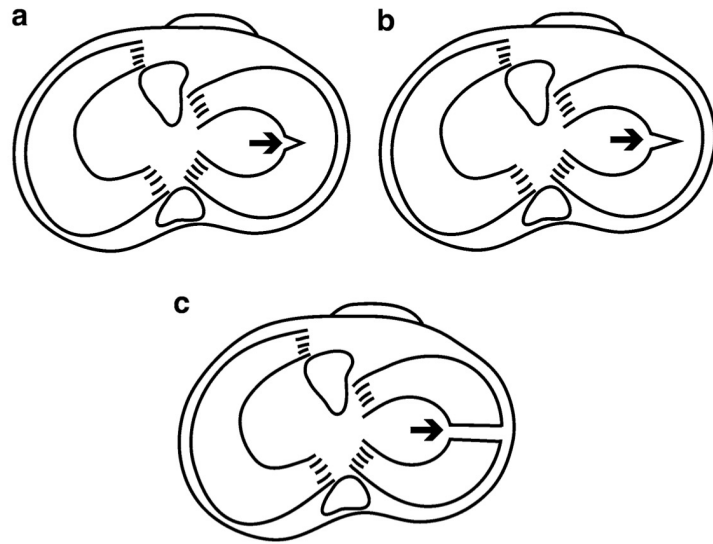


Conclusions

The LM complete radial tear at different tear sites caused different detrimental effects on the load distribution and transmission functions and the effect was greatest in the posterior root tear, followed by the posterior portion tear and the middle portion tear in the deep-flexed position. As complete radial tears of the meniscus, especially at the posterior root, have a harmful impact on the load distribution and transmission functions, these tears should be repaired to restore the biomechanical function and prevent the progression of knee osteoarthritis.

Effect of radial meniscal tear on in situ forces of meniscus and tibiofemoral relationship

Yuta Tachibana¹ · Tatsuo Mae¹ · Hiromichi Fujie² · Konsei Shino³ · Tomoki Ohori¹ · Hideki Yoshikawa¹ · Ken Nakata¹

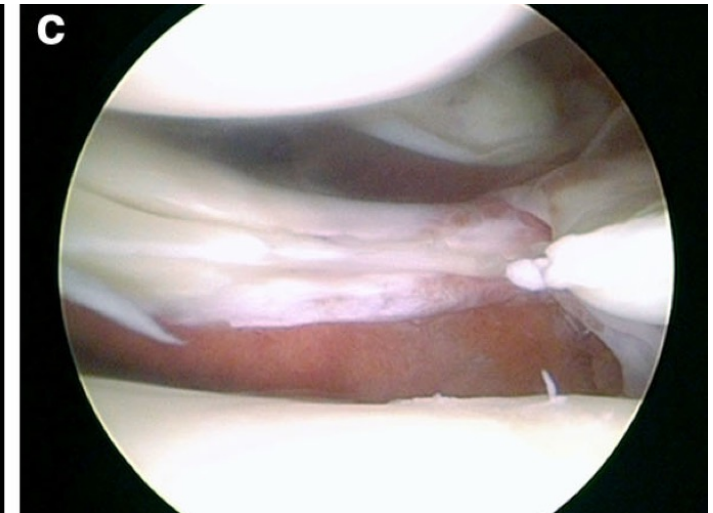
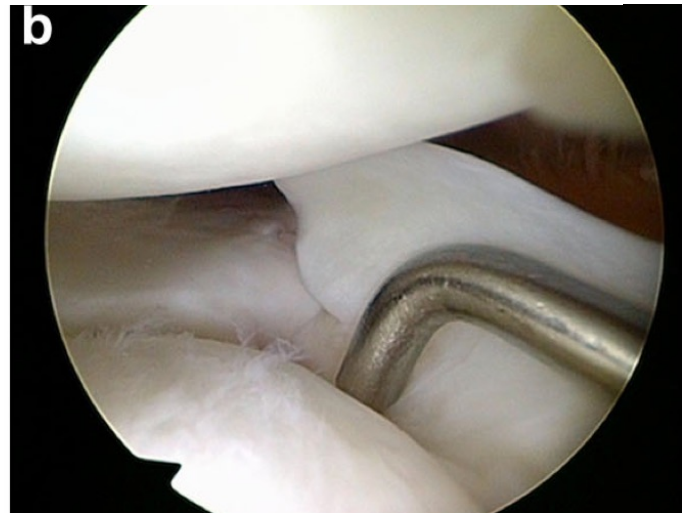
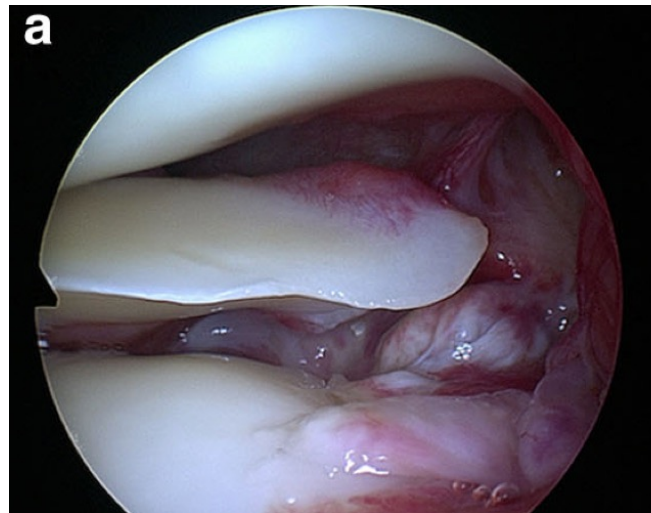
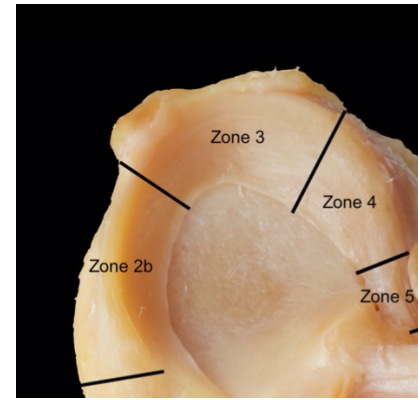


Conclusion

A radial tear of 100% width involving the rim significantly decreased the in situ force of the lateral meniscus and caused medial shift and valgus rotation of the tibia, whereas a radial tear of up to 66% width produced only little change.

Posterior root tears of the lateral meniscus

Matthias J. Feucht · Gian M. Salzmann ·
 Gerrit Bode · Jan M. Pestka · Jan Kühle ·
 Norbert P. Südkamp · Philipp Niemeyer



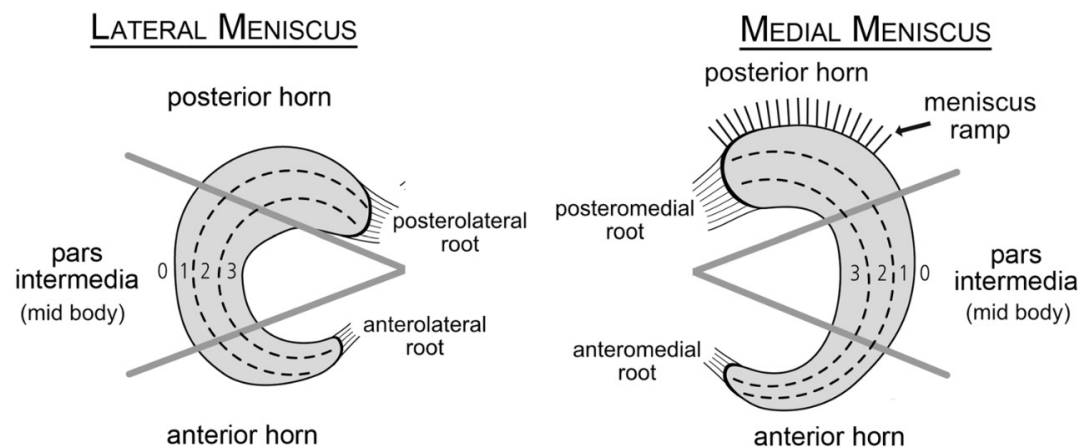
| | | |
|---------|--|--|
| Typ I | Root avulsion | Radial tear with oblique flap |
| Typ II | Radial split tear within 1 cm from the root insertion | T-shape tear (radial tear with longitudinal component) |
| Typ III | Complex root tear with radial and longitudinal component | Longitudinal cleavage between the bony insertion and menisiofemoral ligament insertion |
| Typ IV | – | Chronic inner loss type (chronic tear with a substantial distance between the meniscus and the root remnant) |



Management of traumatic meniscus tears: the 2019 ESSKA meniscus consensus

Sebastian Kopf¹ · Philippe Beaufils² · Michael T. Hirschmann³ · Niccolò Rotigliano³ · Matthieu Ollivier⁴ · Helder Pereira⁵ · Rene Verdonk⁶ · Nikica Darabos⁷ · Panagiotis Ntagiopoulos⁸ · David Dejour⁹ · Romain Seil^{10,11} · Roland Becker¹²

Received: 31 October 2019 / Accepted: 3 January 2020 / Published online: 13 February 2020
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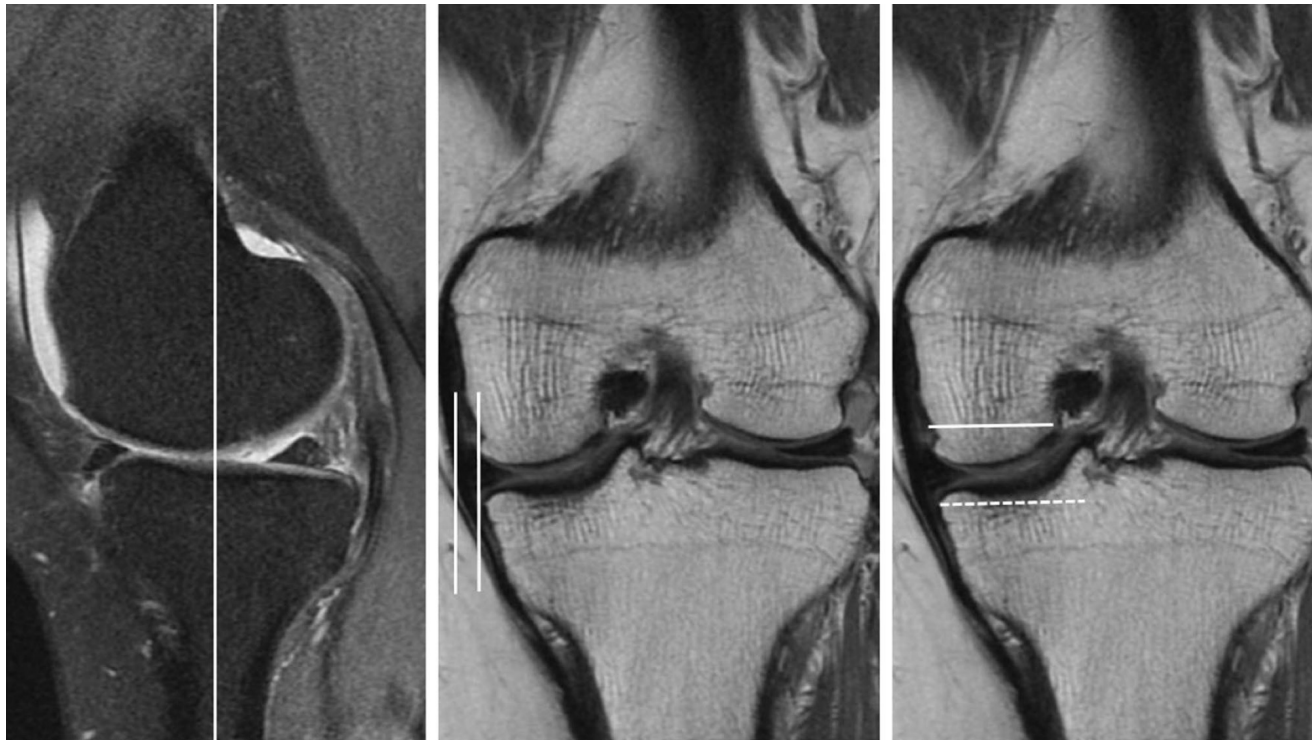
14. What are the indications for the different treatment options for radial traumatic meniscus tears (except root tears) in stable knees?

(a) Complete radial tears may exert a detrimental effect on the knee, because they potentially represent an almost complete loss of meniscus function. In general, traumatic radial meniscus tears should be treated with repair, left in situ or partial meniscectomy. Radial tears of zones 1 and 2 should be repaired to restore the integrity of the rim in patients with or without concomitant ACL reconstruction [69, 103, 106, 149, 151–153]. Only when the tear is technically not repairable or a re-tear of a failed repair occurs should partial meniscectomy be considered. Partial meniscectomy should not be the first-line treatment for tears of zone 1 and 2, because of its worse long-term outcome than repaired tears [8, 69, 149] (*Grade C*).

(b) Nontreatment of the radial tear was also described as a treatment option for stable tears in all three zones (1–3) during concomitant ACL reconstruction [24, 69, 132, 135, 139, 145, 149]. Despite the good clinical results, the healing rates of repeated arthroscopic surgeries were very low, and these studies were only mid-term follow-up studies. Thus, this treatment approach is not recommended (*Grade D*).

Large meniscus extrusion ratio is a poor prognostic factor of conservative treatment for medial meniscus posterior root tear

Yoon-Ho Kwak¹ · Sahnghoon Lee¹ · Myung Chul Lee¹ · Hyuk-Soo Han¹ 

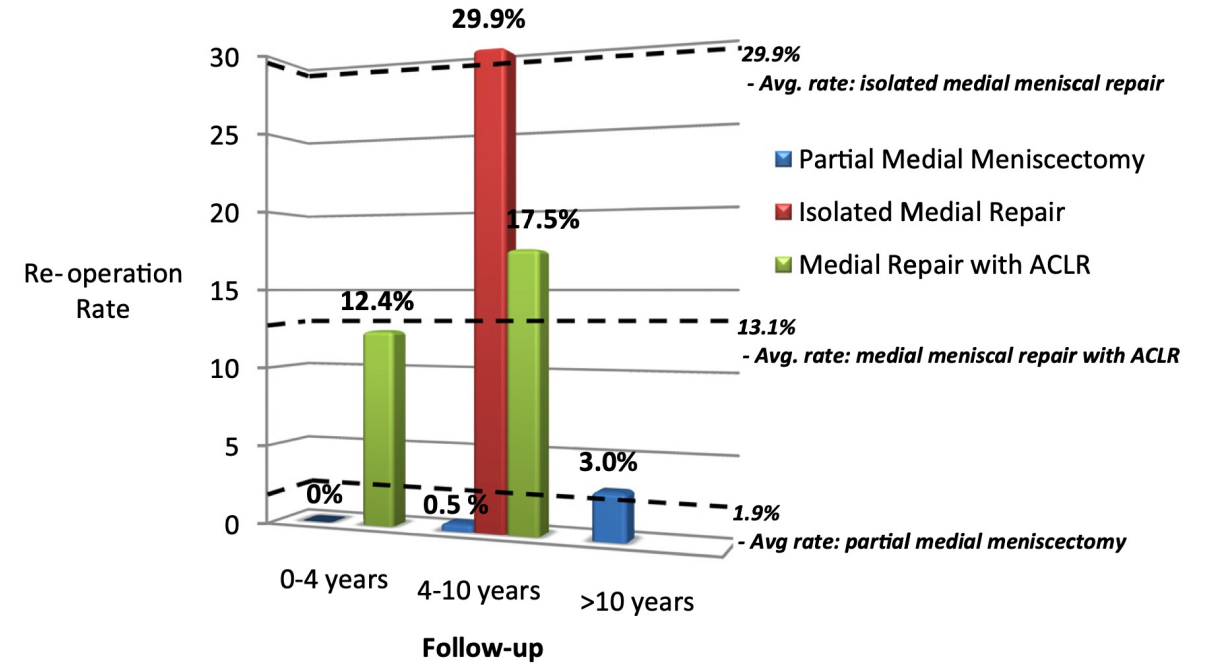
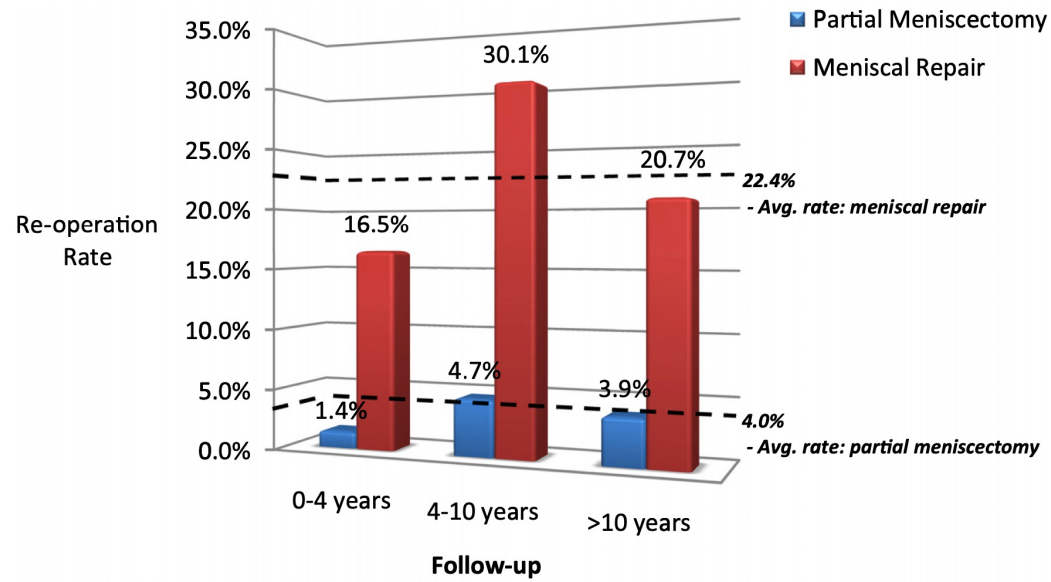


Conclusions

In conclusion, large meniscus extrusion (ME-MFC ratio and ME-MTP ratio) was a reliable poor prognostic factor of conservative treatment for MMPRT. ME-MFC ratio was found to be the most significant prognostic factor. Therefore, for MMPRT patients with large meniscus extrusion, early surgical repair could be considered as the primary treatment option.

Meniscal Repair Versus Partial Meniscectomy: A Systematic Review Comparing Reoperation Rates and Clinical Outcomes

E. Scott Paxton, M.D., Michael V. Stock, B.E., and Robert H. Brophy, M.D.



Meniscal Repair Versus Partial Meniscectomy: A Systematic Review Comparing Reoperation Rates and Clinical Outcomes

E. Scott Paxton, M.D., Michael V. Stock, B.E., and Robert H. Brophy, M.D.

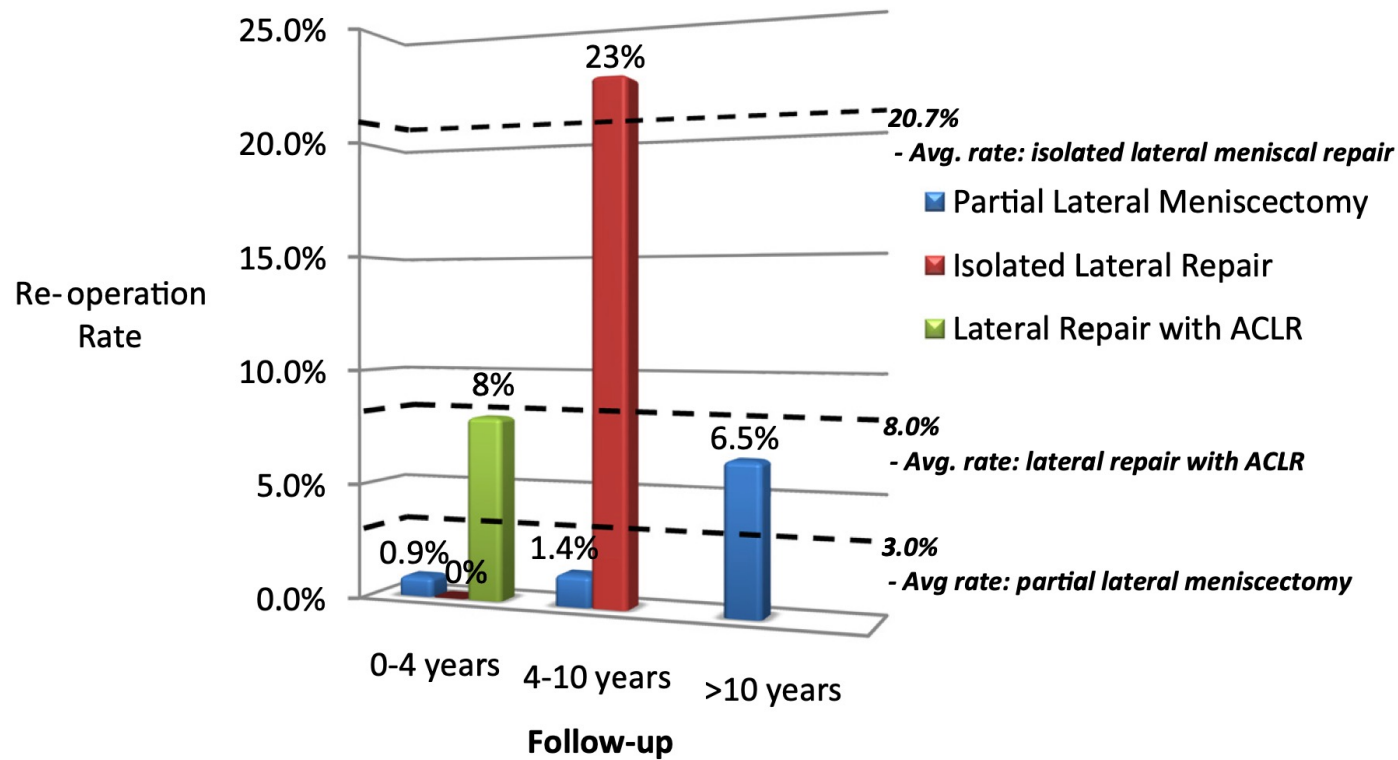
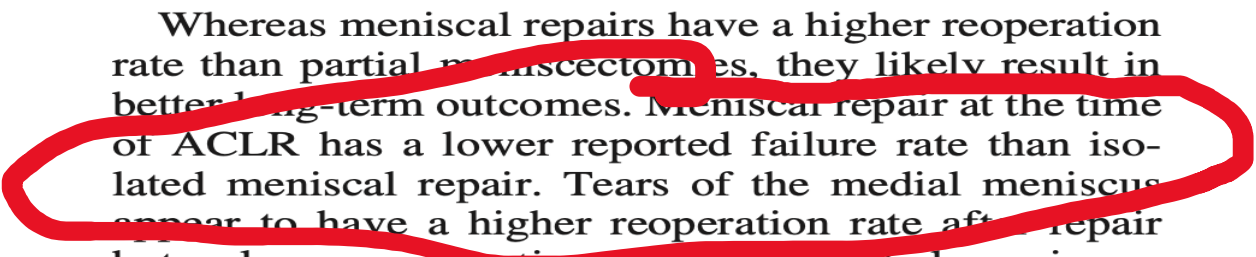


TABLE 5. Radiographic Changes After Minimum of 10 Years' Follow-up

| Procedure | Studies (n) | Repairs (n) | Fairbank Grade of Operated Knee | | | | | |
|--|-------------|-------------|---------------------------------|-----|-----|-----|----|-----|
| | | | 0 | I | II | III | IV | |
| Meniscal repair ^{30,63,87} | 3 | 109 | 78% | 19% | 2% | 1% | 0% | 3% |
| Partial meniscectomy ^{19,122,124} | 3 | 104 | 63% | 24% | 12% | 1% | 0% | 13% |

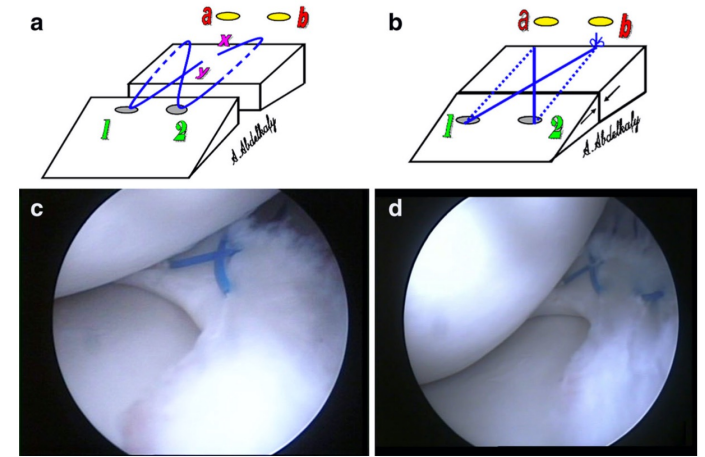
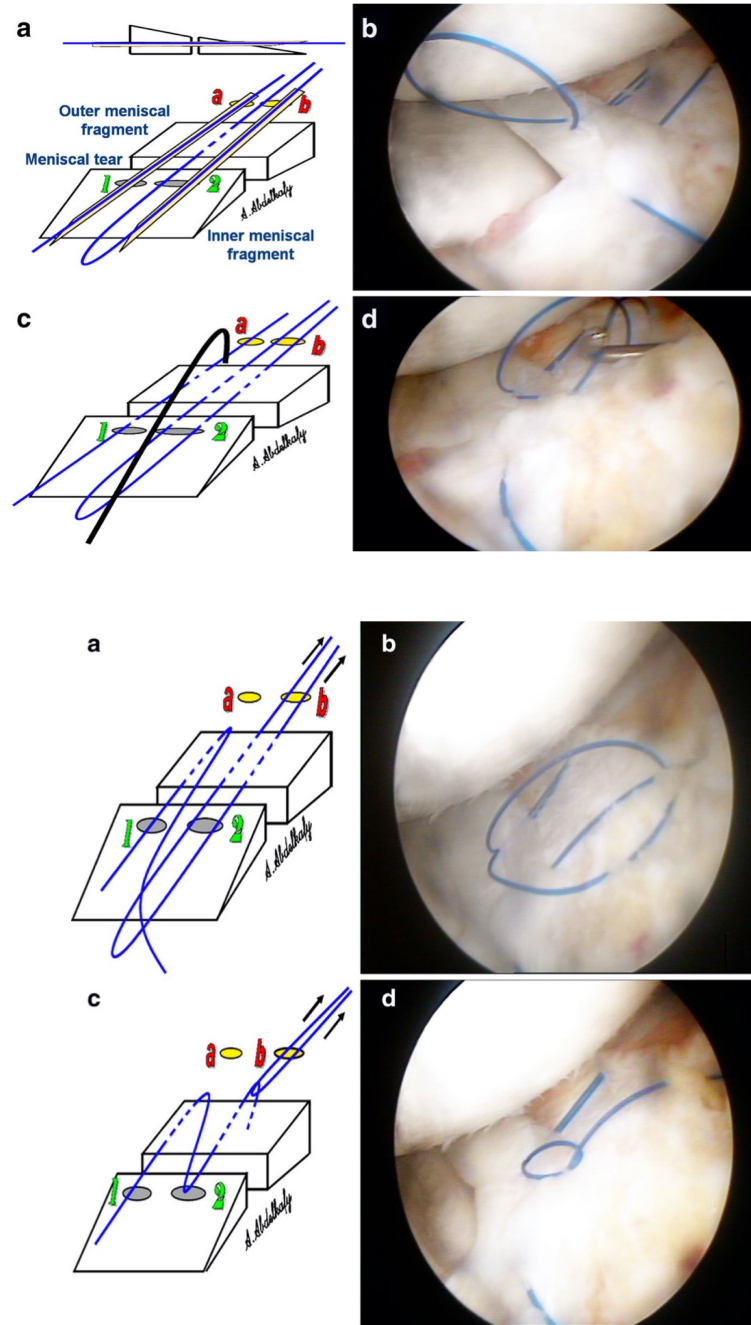
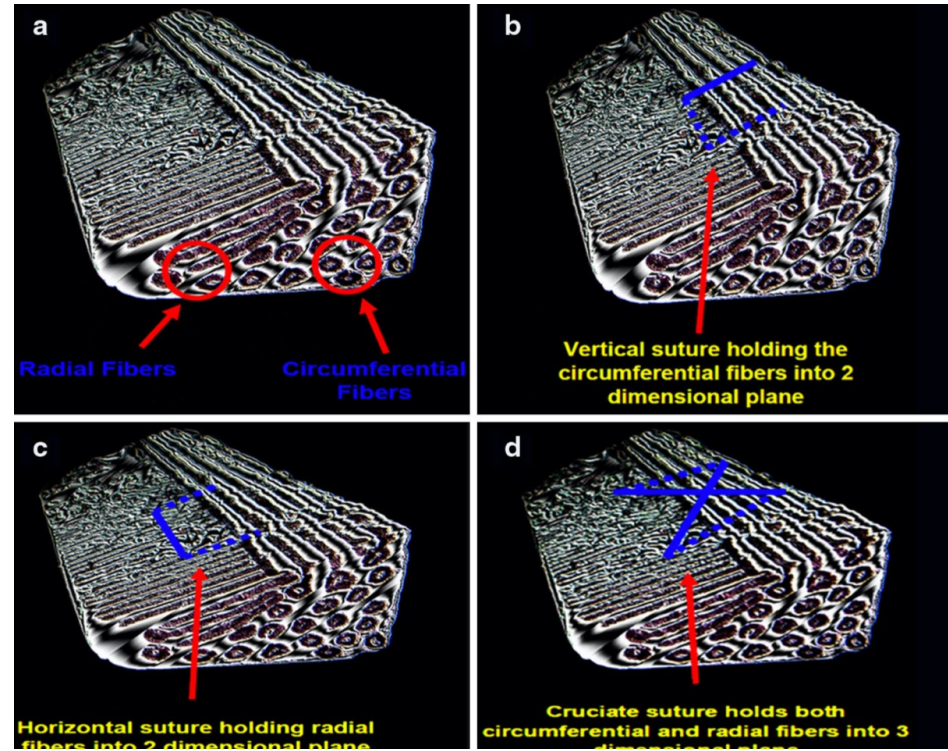
CONCLUSIONS

Whereas meniscal repairs have a higher reoperation rate than partial meniscectomies, they likely result in better long-term outcomes. Meniscal repair at the time of ACLR has a lower reported failure rate than isolated meniscal repair. Tears of the medial meniscus appear to have a higher reoperation rate after repair but a lower reoperation rate after partial meniscectomy when compared with tears of the lateral meniscus. Such data have the potential to improve patient selection and counseling regarding surgical treatment of meniscal tears.



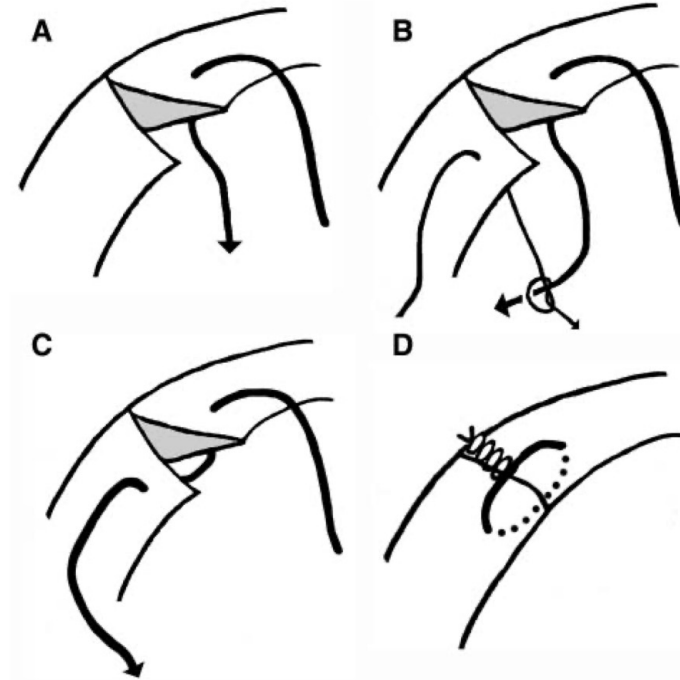
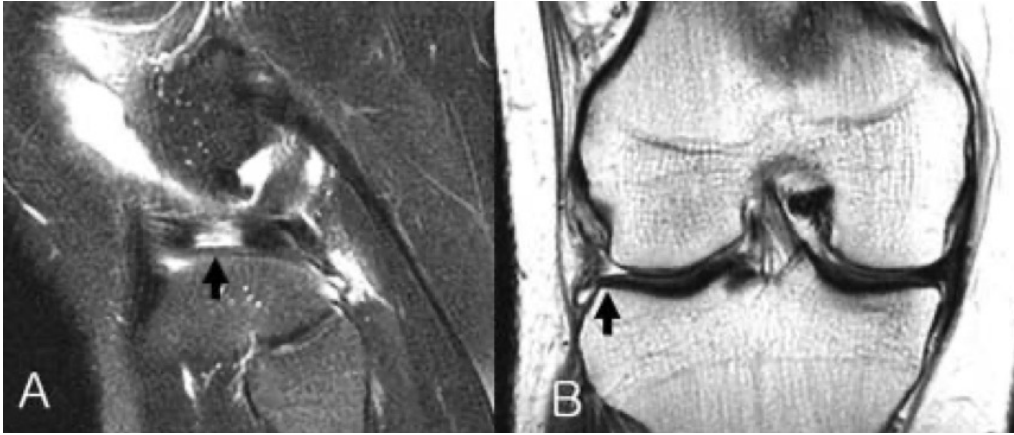
The concept of three-dimensional hold of both circumferential and radial collagen fibres of the meniscus

Ashraf Abdelkafy

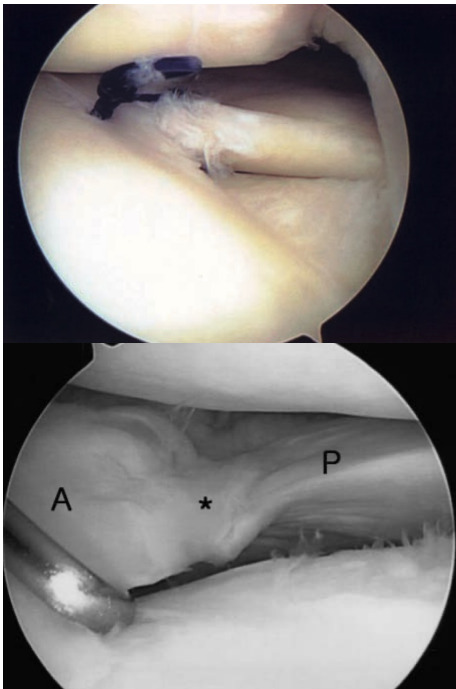


Meniscal Repair for Radial Tears of the Midbody of the Lateral Meniscus

Nam-Hong Choi,^{*†} MD, Tae-Hyung Kim,[‡] MD, Kyung-Mo Son,[§] MD, and Brian N. Victoroff,^{||} MD
Investigation performed at Eulji Medical Center, Seoul, Korea



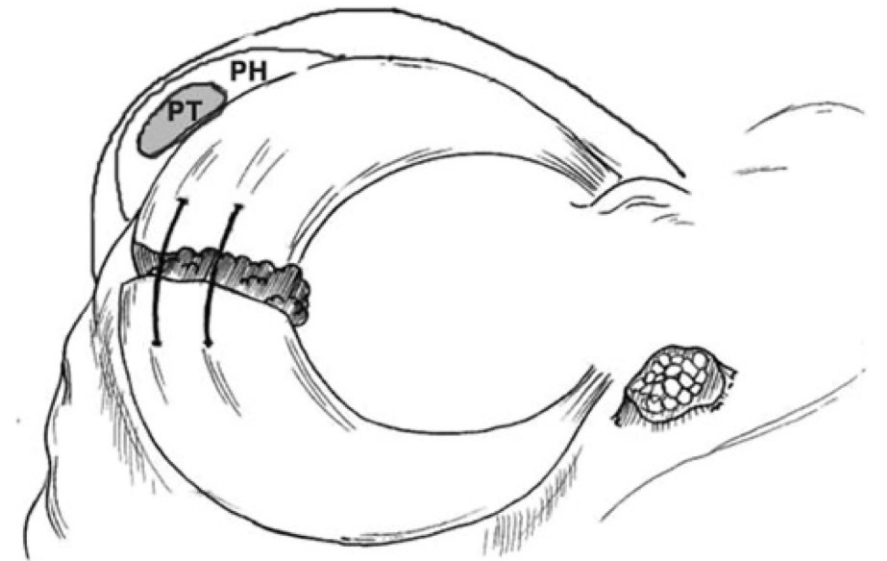
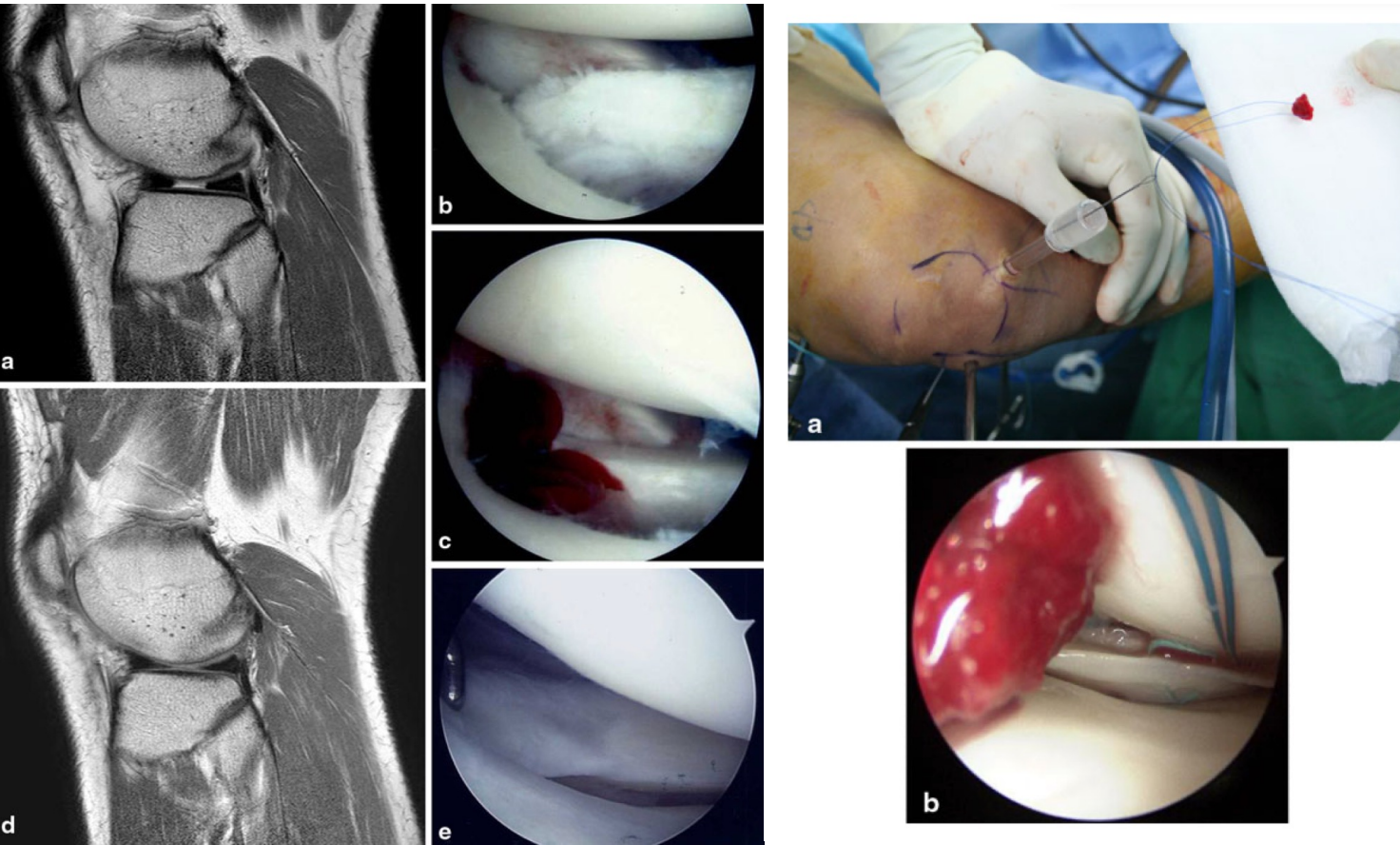
92%



Follow-up MRI scan showed that 5 (35.7%) of the 14 menisci were healed, 8 (57.2%) were partially healed, and 1 (7.1%) was not healed. Two patients demonstrated meniscal extrusion on follow-up MRI. Among those

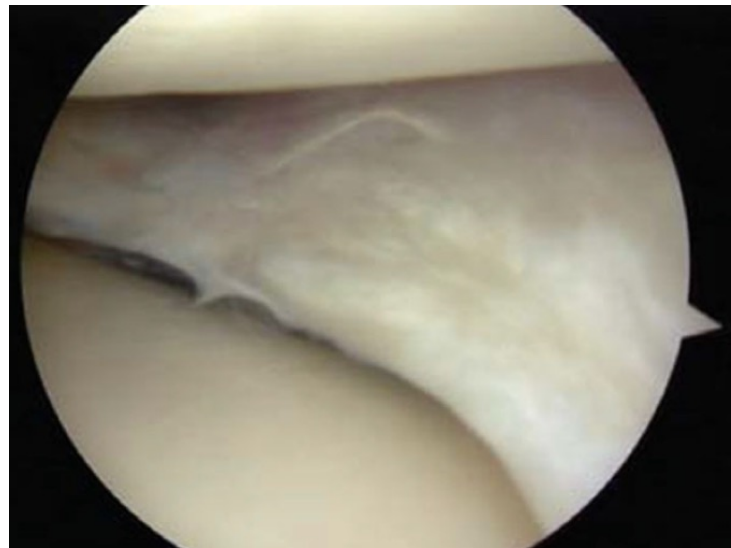
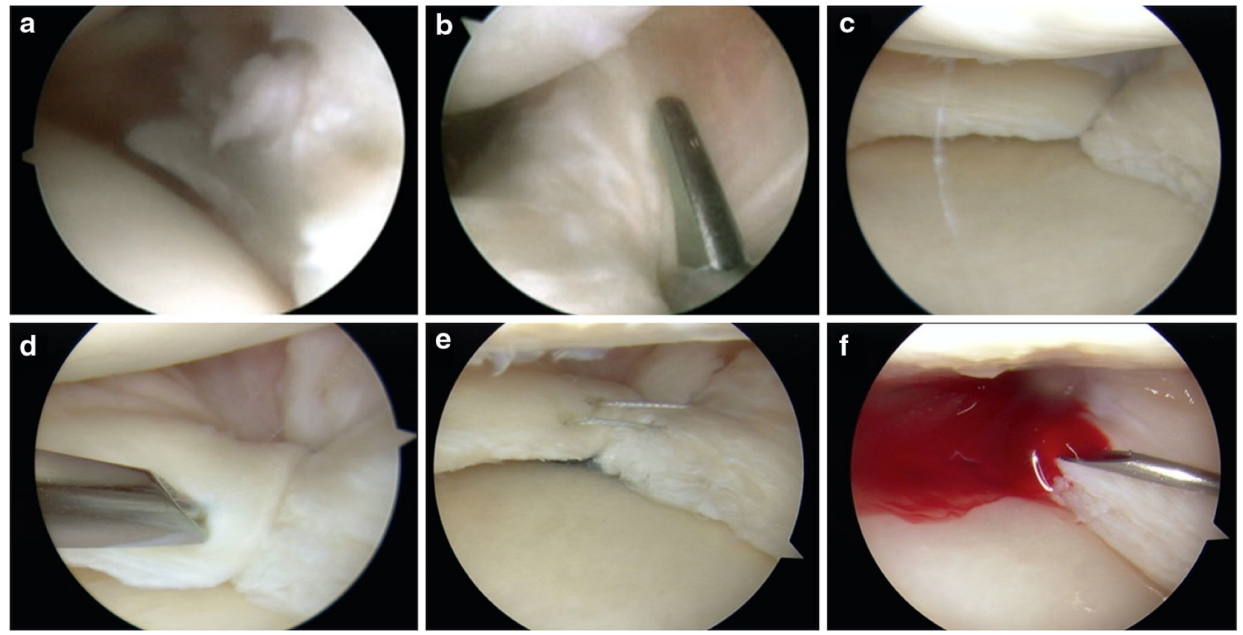
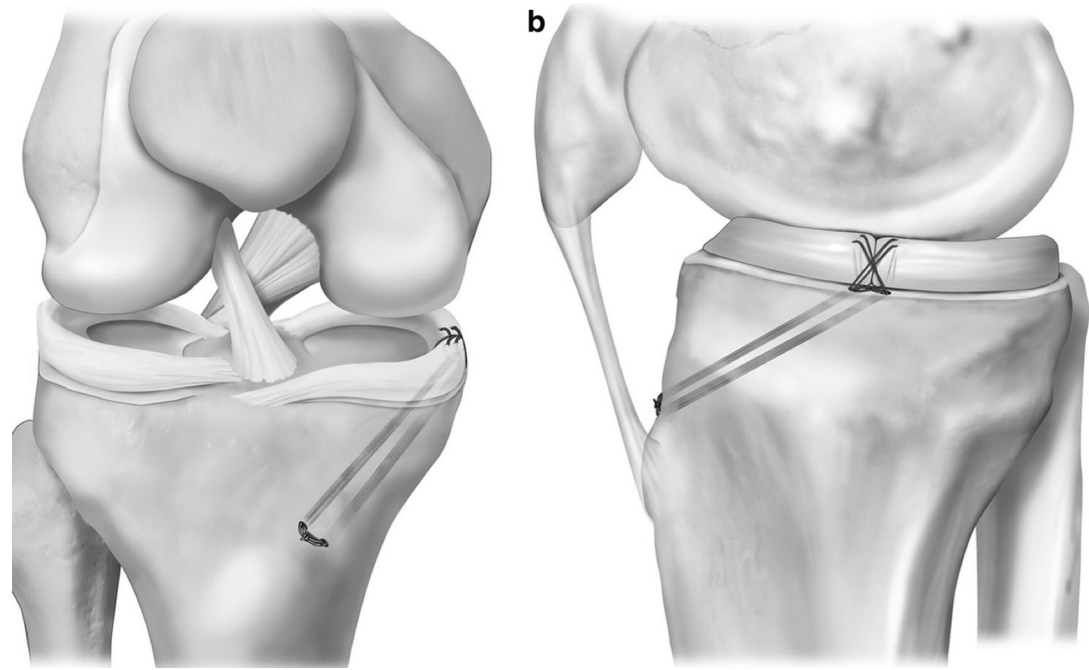
Arthroscopic inside-out repair of complete radial tears of the meniscus with a fibrin clot

Ho Jong Ra · Jeong Ku Ha · Suk Hwan Jang ·
Dhong Won Lee · Jin Goo Kim



Repair of a complete radial tear in the midbody of the medial meniscus using a novel crisscross suture transtibial tunnel surgical technique: a case report

Evan W. James · Christopher M. LaPrade ·
John A. Feagin · Robert F. LaPrade



0363-5465/91/1906-0626\$02.00/0
 THE AMERICAN JOURNAL OF SPORTS MEDICINE, Vol. 19, No. 6
 © 1991 American Orthopaedic Society for Sports Medicine

Use of the fascia sheath coverage and exogenous fibrin clot in the treatment of complex meniscal tears*

CHARLES E. HENNING,†‡ MD, KIM M. YEAROUT, PT, STEVEN W. VEQUIST, PT,
 ROBERT J. STALLBAUMER, RN, AND KRISTA A. DECKER

From the Mid-America Center for Sports Medicine, Wichita, Kansas

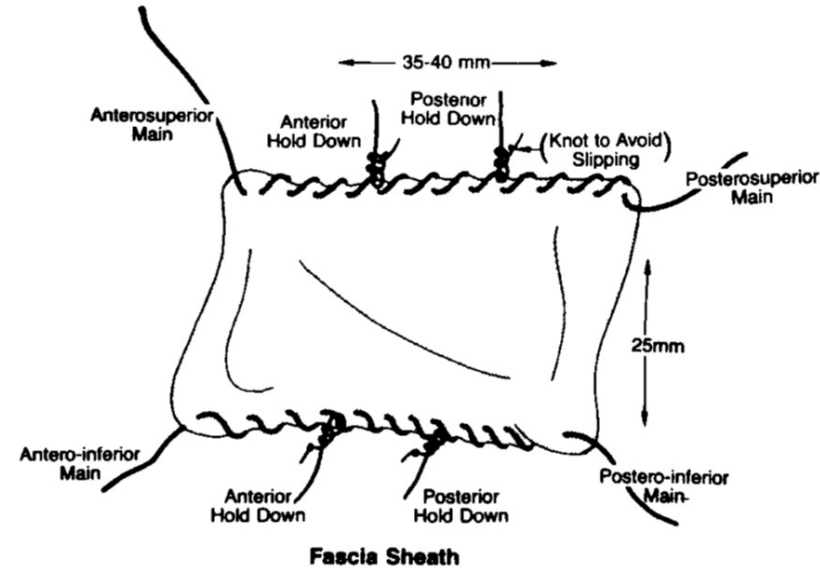
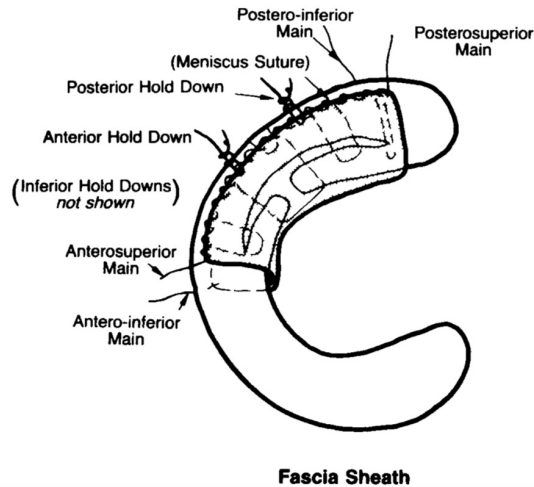


TABLE 1
 Comparative healing rates, rasp peripheral rim vs. sheath when excluding tears in the middle one-third

| | Complete healing | | Incomplete healing | | Failed | |
|---------------------------------|------------------|------|--------------------|------|--------|------|
| | No. | (%) | No. | (%) | No. | (%) |
| Rasp rim ^a N = 58 | 30 | (51) | 14 | (24) | 14 | (24) |
| Sheath ^b N = 26 | 10 | (38) | 14 | (54) | 2 | (8) |

^a Previous series.

^b Current series.

The concept of meniscus wrapping

Jacobi M, Jakob RP

Meniscal repair: enhancement of healing process; the meniscus,

P. Beaufils, R. Verdonk,

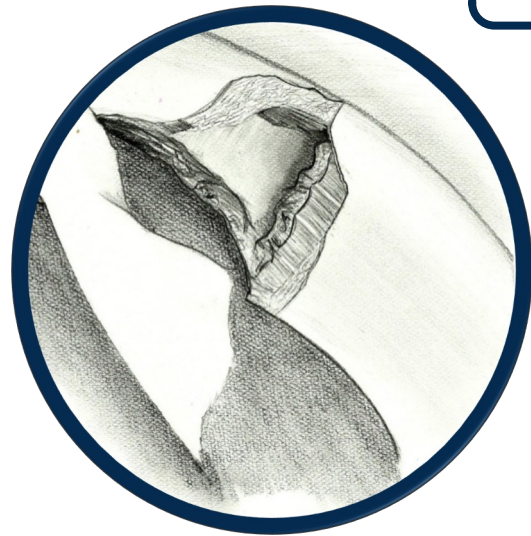
The Meniscus; Springer, 2010

HOW TO WORK IN THE
ARTHROSCOPIC MODE ?



Prof. Dr. med. Roland Jakob

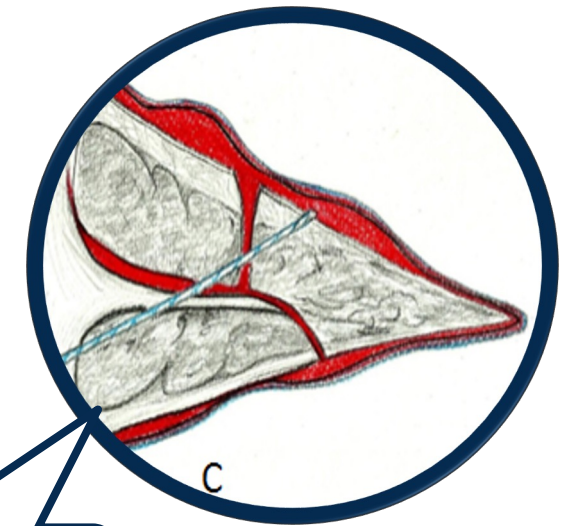
Arthroscopic technique of collagen Matrix-based Meniscus Repair: AMMR



Reduction Suturing & Stabilization Wrapping

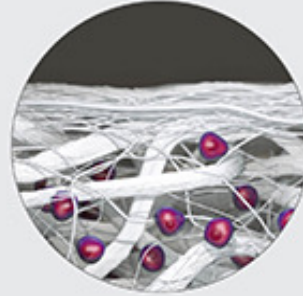


«Biological chamber» created by the wrapping. The membrane keeps cells in place and creates a protected environment.



Injection of biologics
(BMA)

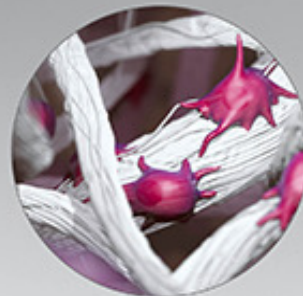
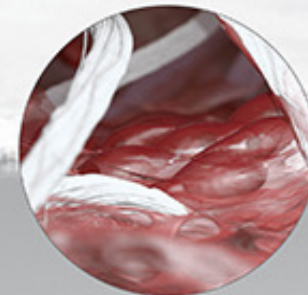
Bi-layer collagen membrane: Chondro-Gide®



A barrier to prevent cell diffusion
The smooth, compact top layer is also sturdy enough to protect the cells and newly forming cartilage from shear stress in the joint



Rough, porous bottom layer
Adheres to the defect, keeping the membrane in place



A new device for the technique



INSTRUCTION MANUAL

Medical device manufactured at Aesculap Chifa. Before using the device, you should read this manual.

Characteristics

Manufactured product made of high-quality, specialized stainless steel.

Storage

Device should be stored in a standard condition, away from moisture, dust and dirt.

First Use

Before first use, device should be inspected and disinfected as described in the inspection and maintenance section.

Inspection and maintenance

Inspection and maintenance should be performed before each use. It is necessary to perform careful inspection and maintenance of the device to prevent contamination and ensure safe use.

Inspection and function testing

Before each use, it is necessary to perform careful inspection and function testing of the device to prevent contamination and ensure safe use.

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GEBRAUCHSANWEISUNG

Verwendbare medizinische Instrumente bevor Sie die Werkzeuge benutzen, ist es wichtig, dass Sie diese Gebrauchsanweisung lesen.

Charakteristika

Herstellerteil gefertigt aus hochwertigem, spezialisiertem Edelstahl.

Lagerbedingungen

Das Instrument sollte in einem Standardzustand, fern von Feuchtigkeit, Staub und Schmutz gelagert werden.

Erste Verwendung

Bevor die erste Verwendung, sollte das Instrument sorgfältig inspiziert und desinfiziert werden.

Inspektion und Wartung

Inspektion und Wartung sollten vor jeder Verwendung durchgeführt werden, um Kontamination und sichere Nutzung zu gewährleisten.

1. Überprüfung der Bedienung und Funktionalität

Überprüfen Sie vor jeder Verwendung die Funktionalität des Geräts und stellen Sie sicher, dass alle Komponenten ordnungsgemäß funktionieren.

2. Manuelle Reinigung und Desinfektion

Das Instrument sollte nach jeder Verwendung manuell gereinigt und desinfiziert werden.

3. Autoklavieren

Das Instrument sollte nach der manuellen Reinigung in einem Autoklav sterilisiert werden.

4. Lagerung

Das Instrument sollte nach der Sterilisation in einem sauberen Behälter gelagert werden.

5. Inspektion

Das Instrument sollte vor jeder weiteren Verwendung inspiziert werden.

6. Wartung

Das Instrument sollte regelmäßig gewartet werden, um die Lebensdauer zu verlängern.

7. Entsorgung

Das Instrument sollte nach dem Ende der Lebensdauer ordnungsgemäß entsorgt werden.

8. Notizen

Bitte beachten Sie die folgenden Hinweise für die sichere Verwendung des Instruments.

9. Zusätzliche Informationen

Für weitere Informationen wenden Sie sich an unseren Kundendienst.

10. Kontakt

Unser Kundendienst ist für Sie erreichbar unter der angegebenen Telefonnummer.

11. Haftung

Die Haftung für Schäden, die durch die Verwendung dieses Instruments entstehen, ist begrenzt.

12. Sonstiges

Bitte lesen Sie die Bedienungsanleitung des Instruments sorgfältig durch.

13. Anmerkungen

Bitte beachten Sie die folgenden Anmerkungen für die sichere Verwendung des Instruments.

14. Zusätzliche Informationen

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23. Anmerkungen

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24. Zusätzliche Informationen

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Verwendung

Das Instrument sollte nach jeder Verwendung sorgfältig inspiziert werden.

Inspektion

Das Instrument sollte vor jeder Verwendung sorgfältig inspiziert werden.

Wartung

Das Instrument sollte nach jeder Verwendung gewartet werden.

Entsorgung

Das Instrument sollte nach dem Ende der Lebensdauer ordnungsgemäß entsorgt werden.

Notizen

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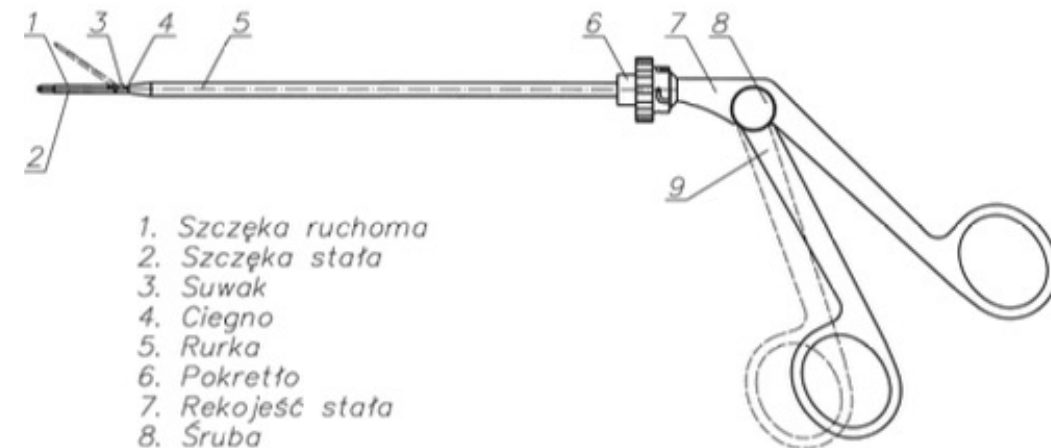
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1. Szczeka ruchoma
2. Szczeka stała
3. Suwak
4. Ciegno
5. Rurka
6. Pokretło
7. Rekojesc stała
8. Śruba
9. Rekojesc ruchoma

Verwendung

Das Instrument sollte nach jeder Verwendung sorgfältig inspiziert werden.

Inspektion

Das Instrument sollte vor jeder Verwendung sorgfältig inspiziert werden.

Wartung

Das Instrument sollte nach jeder Verwendung gewartet werden.

Entsorgung

Das Instrument sollte nach dem Ende der Lebensdauer ordnungsgemäß entsorgt werden.

Notizen

Bitte beachten Sie die folgenden Hinweise für die sichere Verwendung des Instruments.

Zusätzliche Informationen

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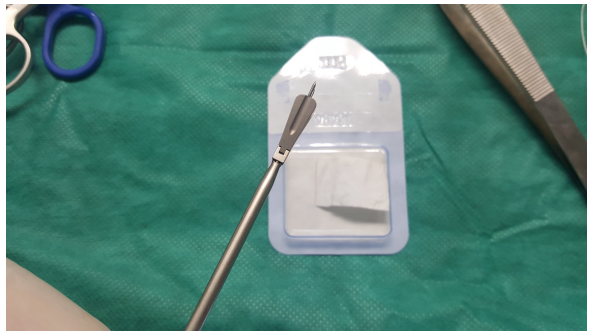
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Kontakt

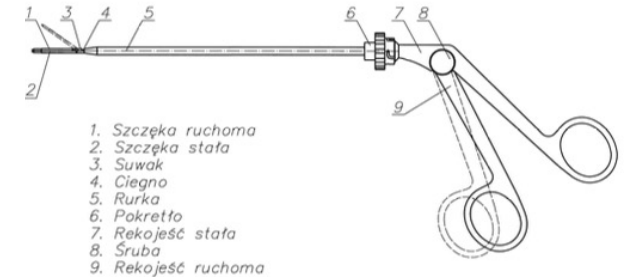
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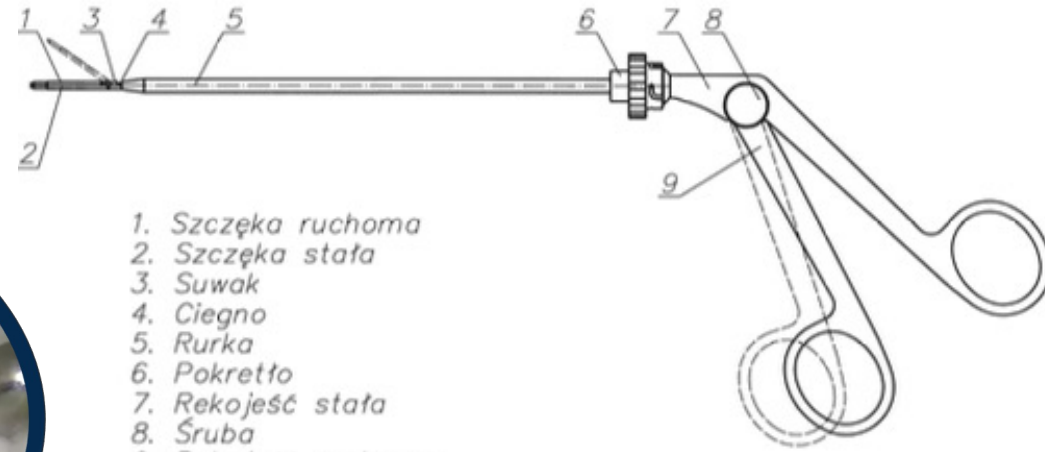
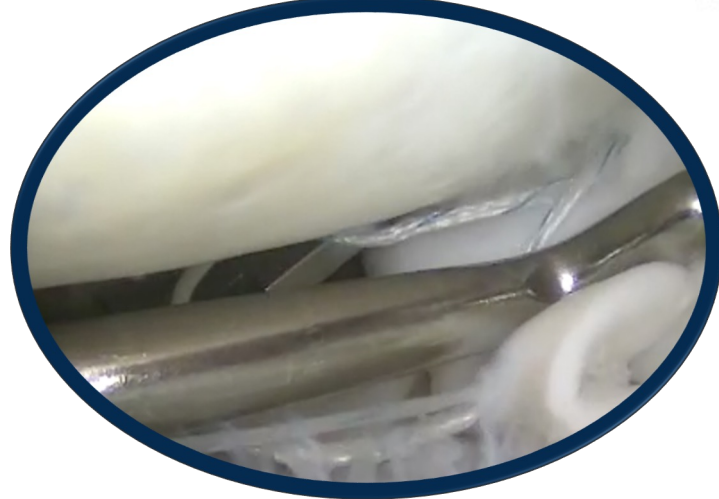
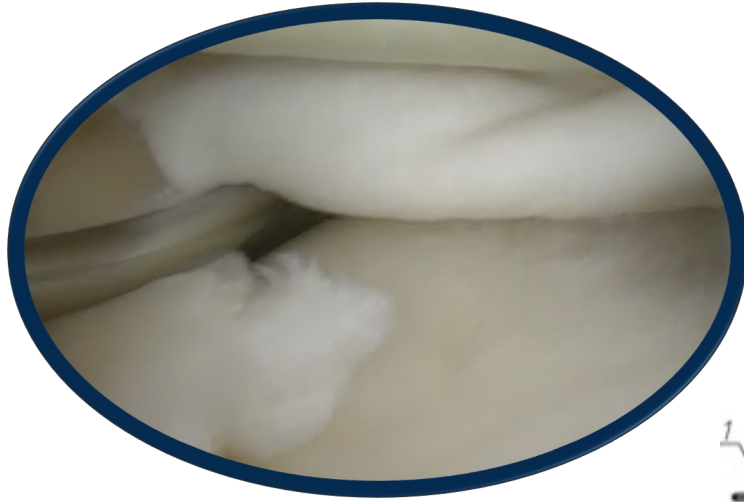
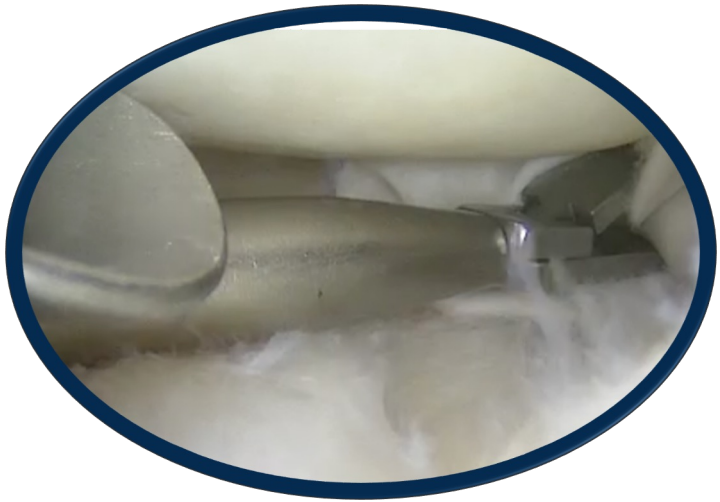
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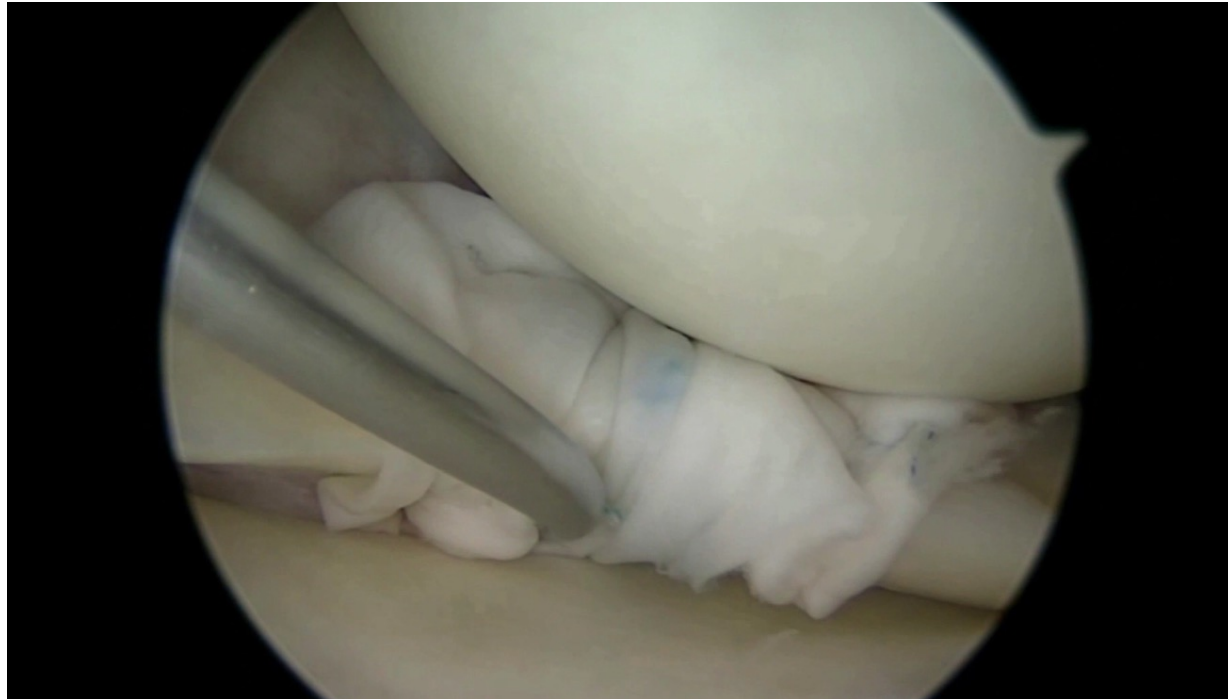
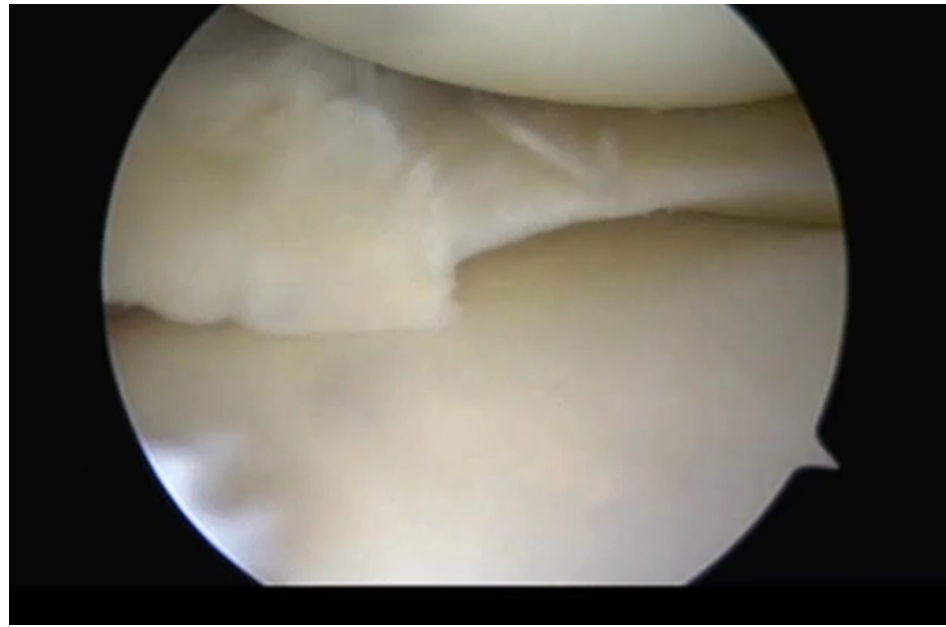
A new device for the technique



A new device for the technique



1. Szczęka ruchoma
2. Szczęka stała
3. Suwak
4. Ciegno
5. Rurka
6. Pokrętło
7. Rekojeść stała
8. Śruba
9. Rekojeść ruchoma



Augmentation Techniques for Meniscus Repair

Leili Ghazi zadeh, MSc¹ Anik Chevrier, PhD² Jack Farr, MD³ Scott A. Rodeo, MD⁴
Michael D. Buschmann, PhD²

¹Biomedical Engineering Institute, Ecole Polytechnique de Montreal, Montreal, Quebec, Canada
²Department of Chemical Engineering, Ecole Polytechnique de Montreal, Montreal, Quebec, Canada
³Cartilage Restoration Center, OrthoIndy, Greenwood, Indiana
⁴Department of Orthopaedics, Hospital for Special Surgery, New York, New York

Address for correspondence Michael D. Buschmann, PhD, Department of Chemical Engineering, Ecole Polytechnique de Montreal, 2900 boul Edouard Montpetit, Montreal, Quebec H3T 1J4, Canada (e mail: michael.buschmann@polymtl.ca).

J Knee Surg

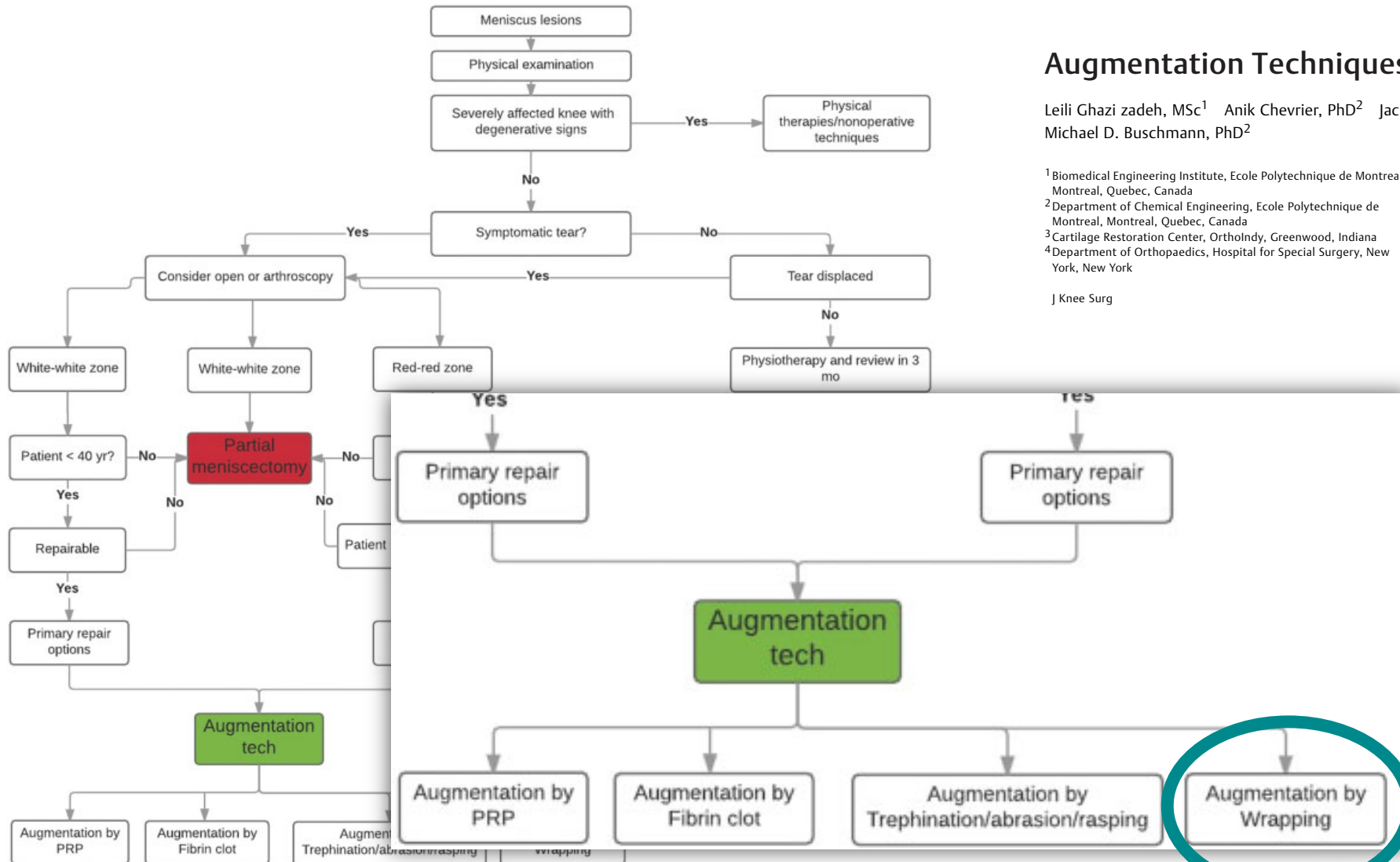
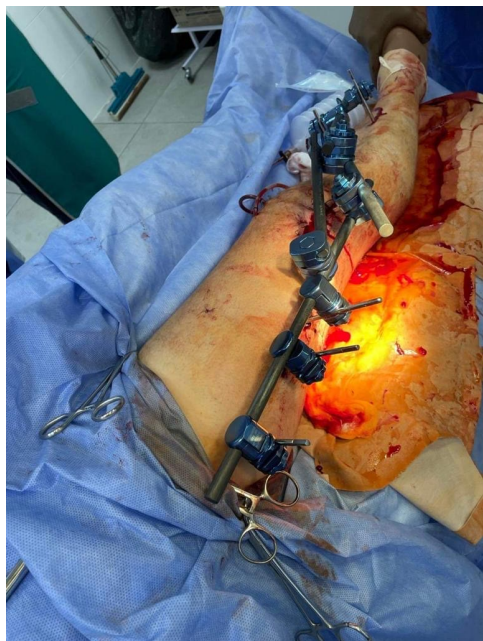


Fig. 1 Treatment algorithm of meniscus lesions. (Adapted from Mordecai et al, 2014.¹¹⁰)

Thank you



Polskie
Towarzystwo
Artroskopowe



Thank you



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ukraina@rehasport.pl

Foundation Notice Me – for Ukraine