

# *Augmentation of Meniscus Repairs using Autogenous Blood Clot*

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# Declaration of Interests



ISAKOS  
CONGRESS  
2023



**Boston**  
Massachusetts  
June 18–June 21

I declare that in the past three years one of the authors has:

- held shares in: Nil
- received royalties from: Nil
- done consulting work for: Nil
- given paid presentations for: Smith and Nephew / Arthrex
- received institutional support from: Nil
- a son who works for Stryker
- developed a meniscus repair needle – MeniPass used in this study  
Portal SportsMed, Brisbane, Australia

# *Introduction*

**Meniscus repair can slow the rate of knee degeneration and hopefully reduce the risk of later arthroplasty. <sup>1</sup>**

**Some meniscus tears have a poor capacity to heal due to**

- **Complexity**
- **Zone of injury (e.g. red-white or white-white areas)**
- **Chronicity**

**Blood (fibrin) clot augmentation has been shown to enhance meniscal healing. <sup>2, 3</sup>**

**Blood clot preparation and placement is technically demanding and is not commonly used**



# *Purpose of Study*

## **1. To standardise a technique for:-**

- Preparing a blood clot
- Passing it into the joint and into a repair site
- Maintaining it in position
- Suturing the meniscus tear with the blood clot securely in place

## **2. To follow a series of patients after augmented meniscus repair to assess rate of healing / failure and satisfaction**



# *Methods - Blood Clot Preparation*

30 mls of blood into a glass jar

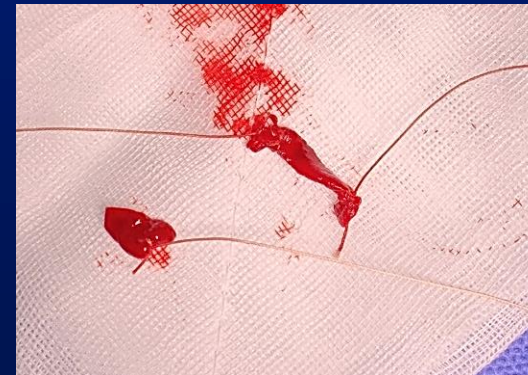
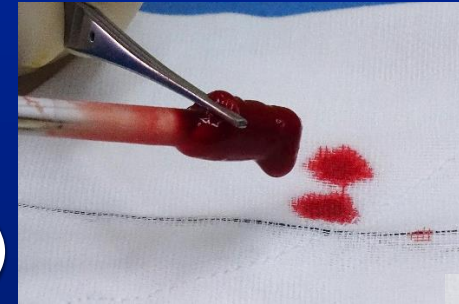
Leave for 7 minutes with glass rod in jar

Begin to slowly stir for 4-5 minutes

Remove clot from glass rod

Dry and cut it to size

Place sutures at each end (2/0 braided absorbable)



## *Methods - Passing clot into the tear*

Pass inside–out sutures via a cannula through the apices of the tear

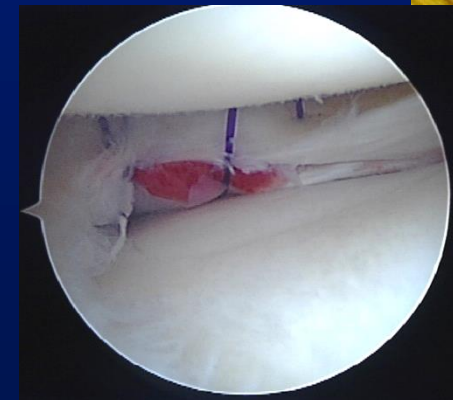
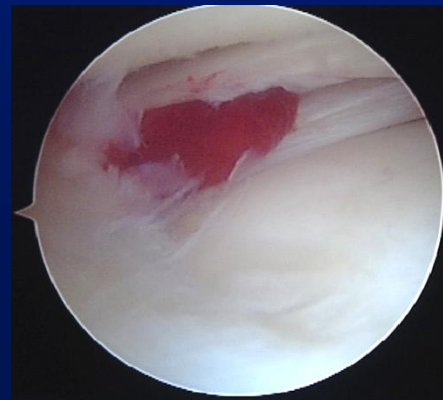
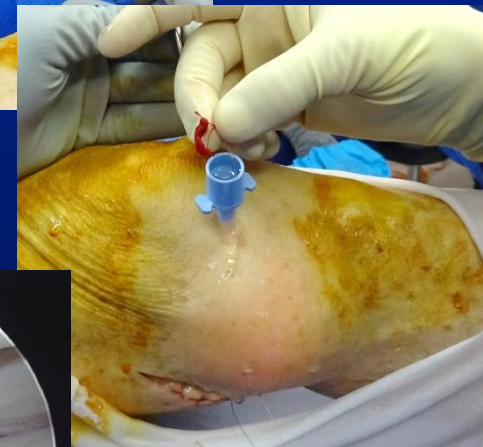
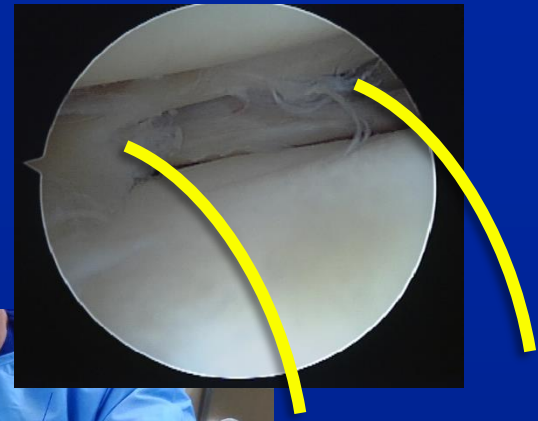
Tie each suture to one end of the sutures holding the clot

Pull the sutures through to place the clot into the tear

Repair the tear with inside-out sutures (absorbable)

Retrieve the sutures through a postero-medial/lateral incision

Tie sutures over the capsule



# Methods - Patients

Retrospective study, Ethics approval, single surgeon, single centre, consecutive series, isolated repairs.

Between January 2016 and September 2021.

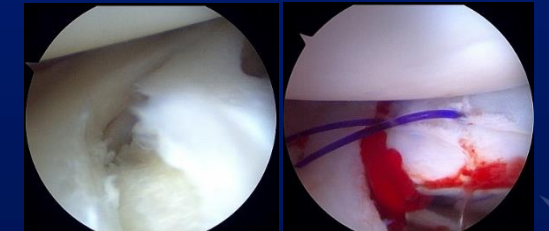
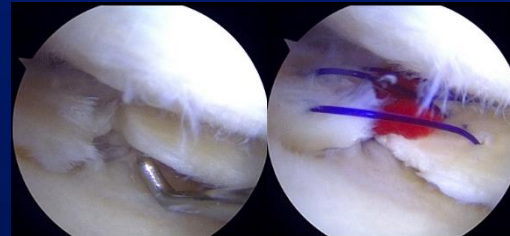
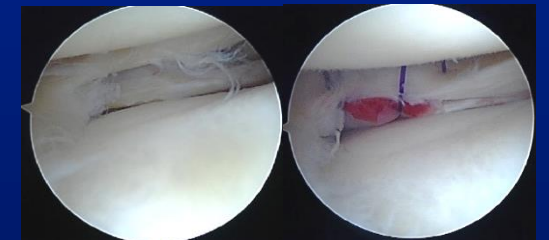
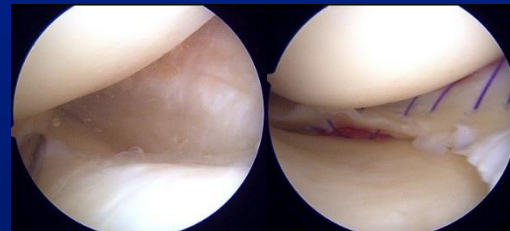
51 augmented meniscal repairs in 50 patients

Mean age 34 (14 – 70).

Medial = 32, Lateral = 19

## Tear types

- Vertical - 22%
- Horizontal cleavage - 14%
- Radial - 31%
- Complex - 33%



# *Methods – Post-Operative Care*

**Brace for safety and comfort – set at 5° – 10°**

**Crutches, non weight-bearing**

**At 2 weeks**

- Wound review
- Remove brace
- Begin gentle flexion and quadriceps setting
- Begin 25% body weight-bearing

**At 3 weeks**

- Progress to 50% body weight-bearing

**At 4 weeks**

- Progress to 75% body weight-bearing

**At 5 weeks**

- Progress to 100% body weight-bearing – 1 or 2 crutches

**At 6 weeks**

- Full weight-bearing, protected with 1 stick
- 90° flexion

**At 12 weeks**

- Independent confident weight-bearing
- 120° flexion





## *Follow up*

**Patients were contacted in December 2021 by email and phone**

**11 patients failed to respond**

**Follow up data was available for:-**

- Up to 24 months for 26 repairs
- Up to 6 months for 39 repairs

**3 patients (3 repairs) had undergone further arthroscopic surgery; i.e. 3 of 41 (9.7%) repairs had failed**



# Results

**All patient reported outcome measures (PROM's) improved significantly except the Tegner score**

- Lysholm Score 56.5 – 92.4 (p<0.0001)
- Oxford Knee Score 30.8 – 45.7 (p<0.0001)
- All KOOS Domains improved significantly (p<0.0001)
- Tegner score 4.5 – 5.6 (p=0.08)

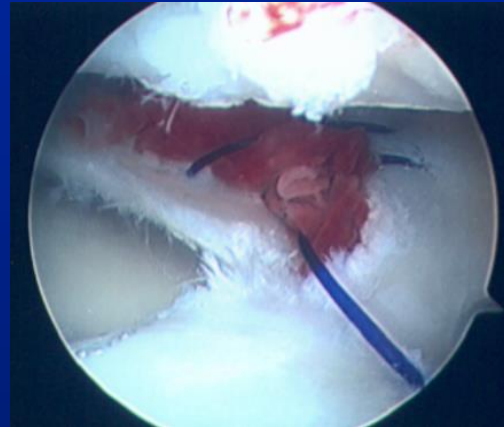
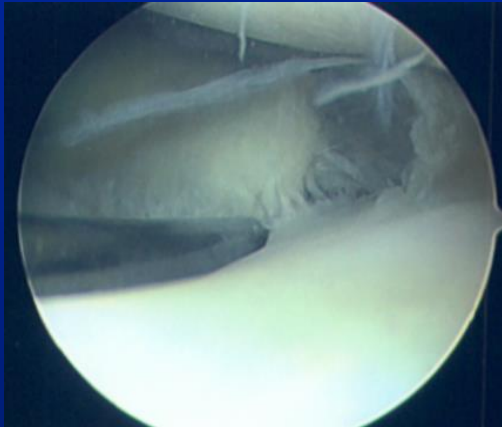
## Complications

- 1 patient developed stiffness which settled over 4-6 months
- 1 patient developed altered sensation in the lower leg which is resolving

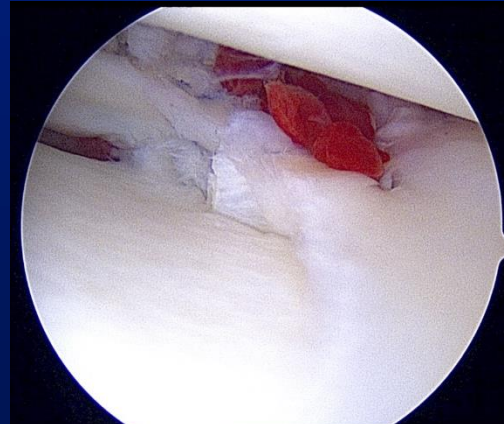
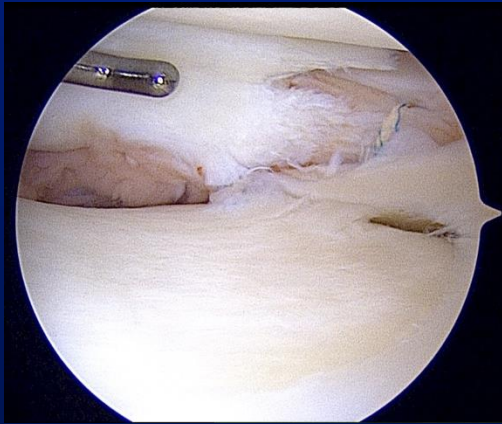


# *Second Look Arthroscopy*

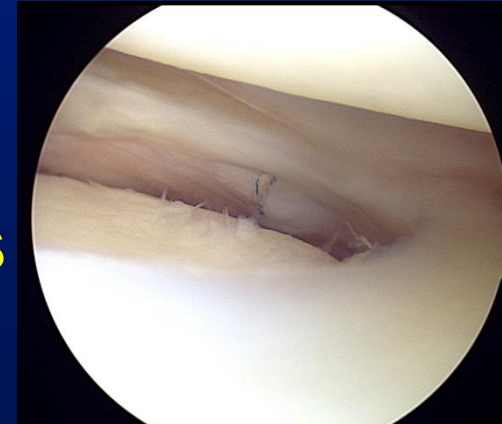
2 patients have had 2<sup>nd</sup> look arthroscopy for other reasons



**At 5  
months**



**At 8  
months**



## *Discussion*

**Augmenting meniscus repairs allows some tears to heal which otherwise would not**

**This technique is reliable and reproducible**

**There is a good success rate with minimal morbidity**

**This should encourage surgeons to undertake meniscus repairs in some cases which would not routinely be repaired**



# *References*

1. Weber J, Koch M, Angele P, et al. The role of meniscal repair for prevention of early onset of osteoarthritis. *J Exp Orthop* 2018; 5: 10.
2. Nakayama H, Kanto R, Kambara S, et al. Successful treatment of degenerative medial meniscal tears in well-aligned knees with fibrin clot implantation. *Knee Surg Sports Traumatol Arthrosc* 2020; 28: 3466–3473.
3. Henning CE, Lynch MA, Yearout KM, et al. Arthroscopic meniscal repair using an exogenous fibrin clot. *Clin Orthop Relat Res* 1990; 64–72.

# Thank You

