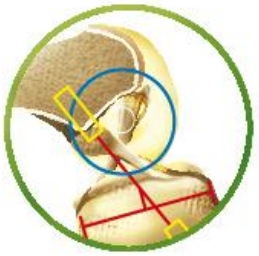
2019 The Meniscus BOLOGNA 4th International Meeting
31 January to 2 February
Royal Hotel Carlton
ESSKA

Burt Klos MD PhD
Stephan Konijnenberg MD

Meniscus dynamic imaging with ultrasound



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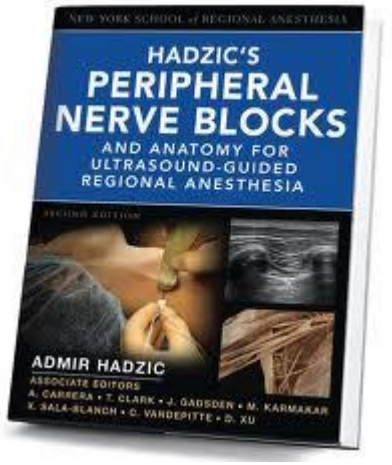
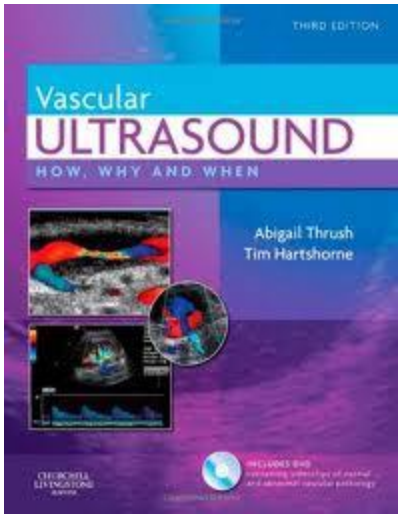
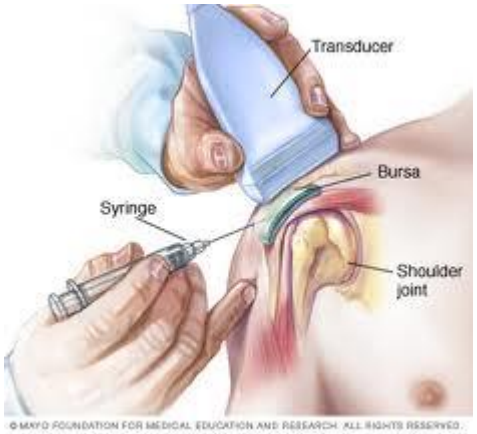
Musculoskeletal Ultrasound

- US Cuff /bursa
- Knee Bakers Cyst
- Knee Tendinitis







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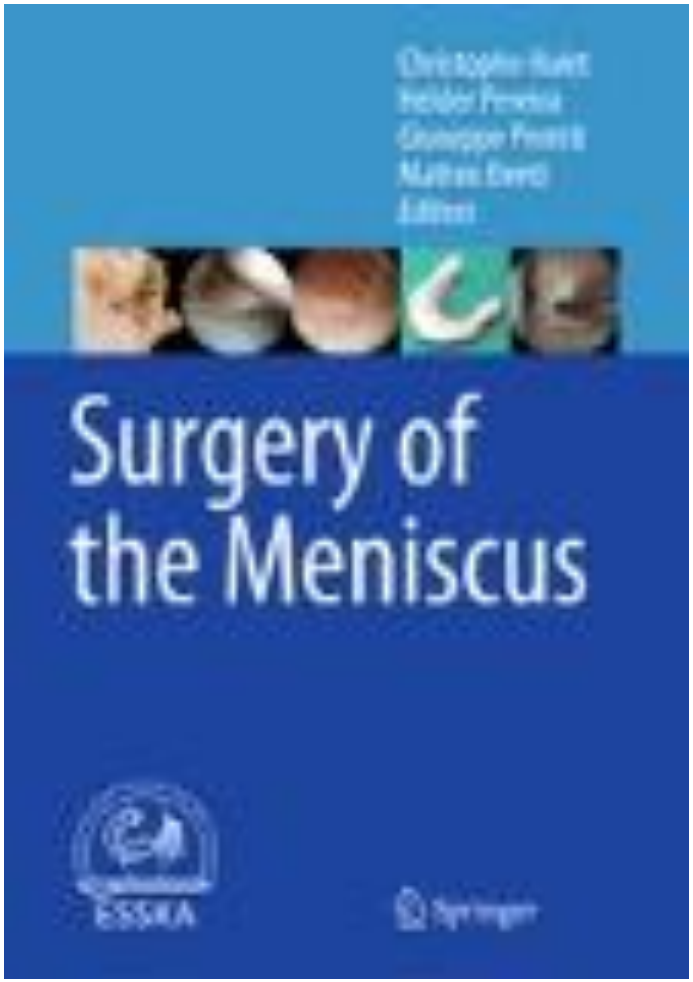
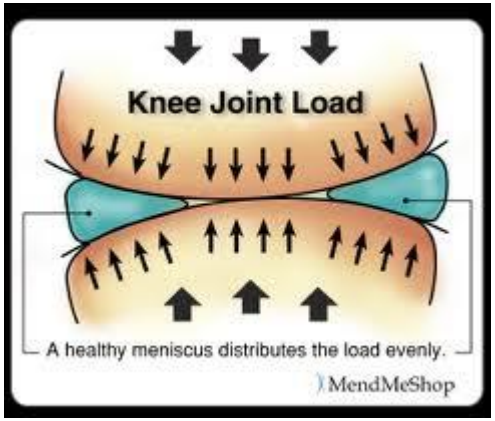
Book Surgery of the Meniscus ESSKA 2016

- Chapter 15



Meniscus lesions

- Conservative treatment
- Operative treatment
- Meniscal repair



- Important factor
- Ligamentous insufficiency

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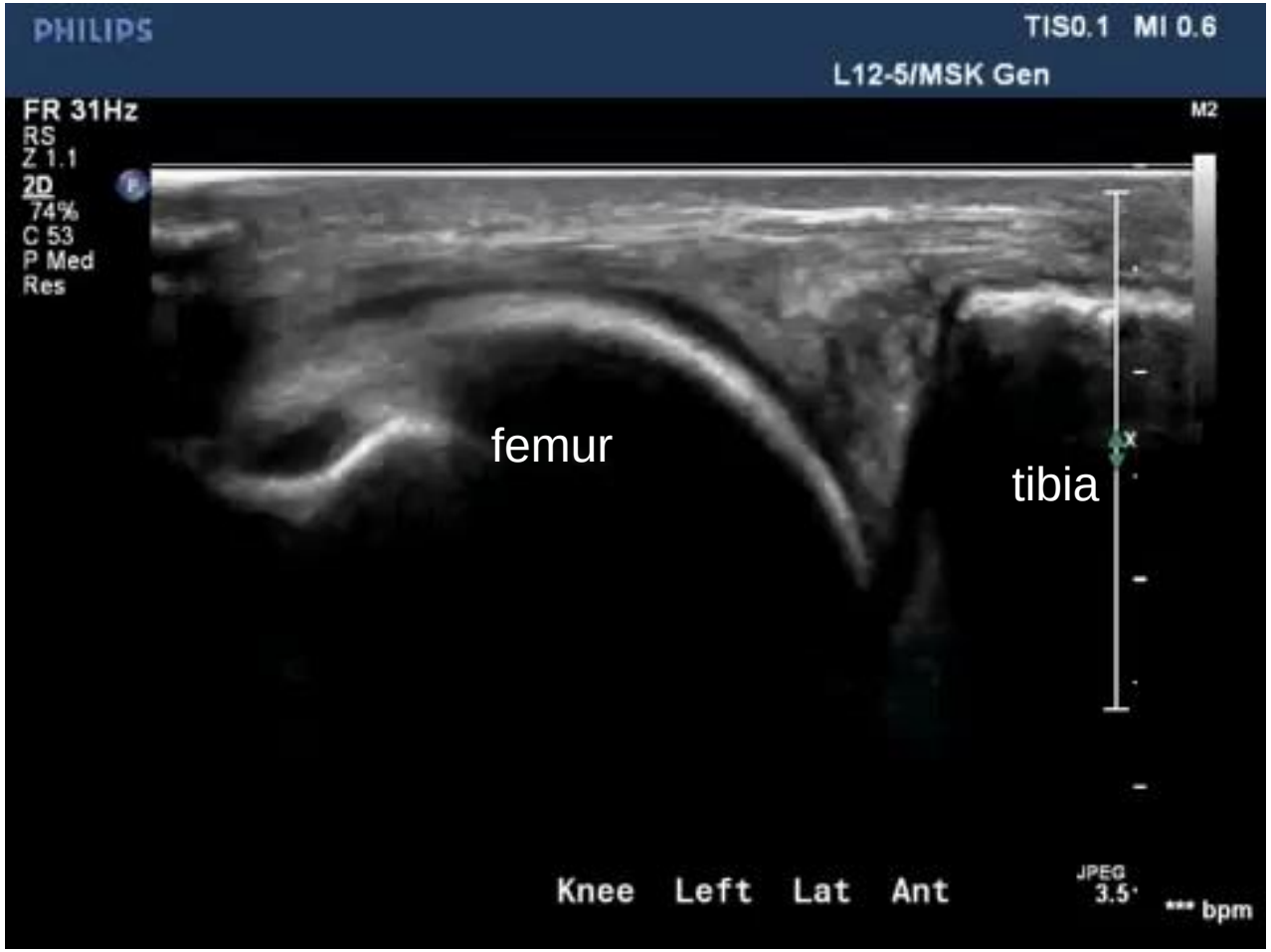
Dynamic HR meniscus ultrasound

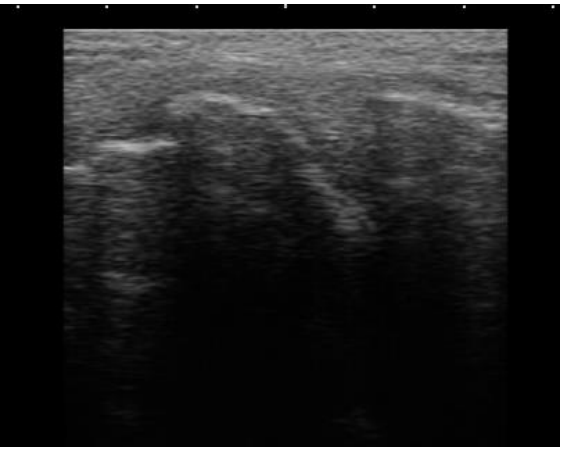


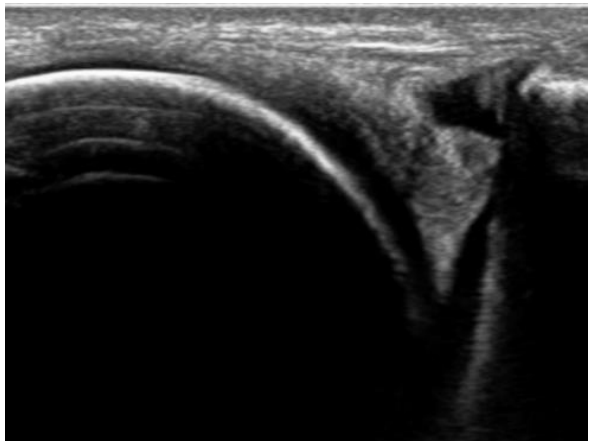
Equipment developments

- High resolution probe 2-22 MHz 512 piezoelectric elements and sono CT software improvement , processor +++
- Non mobile ultrasound tower
- Linear probe > deeper images

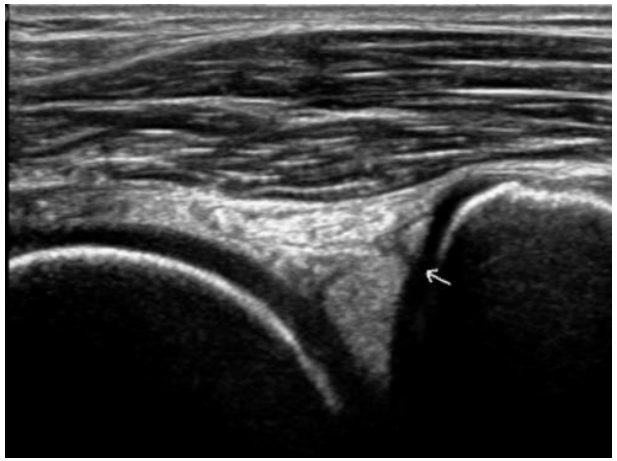
Improvements image quality

2006-2008 2008-2010 2011-2014





2015-2018



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Meniscus ultrasound literature MRI vs MSU meniscus

2008 JBJS -B

Shetty et al London

2014 J Knee Surgery

Cook et al Missouri USA

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JBJS 2008 // J Knee Surgery 2014

- Arthroscopy – US – MRI
- 35 patients chronic 2008 // 71 patients acute 2014
- Sensitivity US 86 % MRI 86 % // US 91 % MRI 91 %
- Specificity US 69 % MRI 100 % // US 84 % MRI 66 %
- Pos PV US 83 % MRI 100 % // US 94 % MRI 84 %
- Neg PV US 75 % MRI 81 % // US 76 % MRI 80 %
- Shetty BJBS Br 2008 // Cook et al USA
- MRI not able to detect all lesions
- US dynamic MRI static

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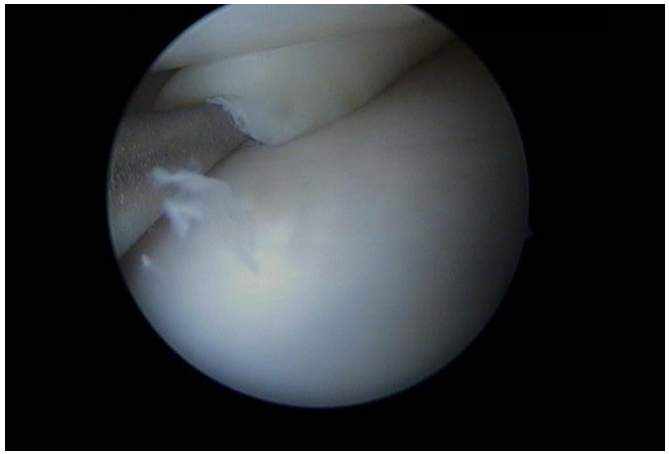
MRI might not be golden standard

- Collateral lesions lateral / ALL / Segond MRI not reliable (Devitt / Feller / Whitehead KSSTA 2017)
- RAMP Hidden lesions B Sonnery Cottet 2015
- False negative (MMPH) in ACL # Ahn 2016 45%



Ultrasound positions

prone ,rotation, supine ,hyperflexion

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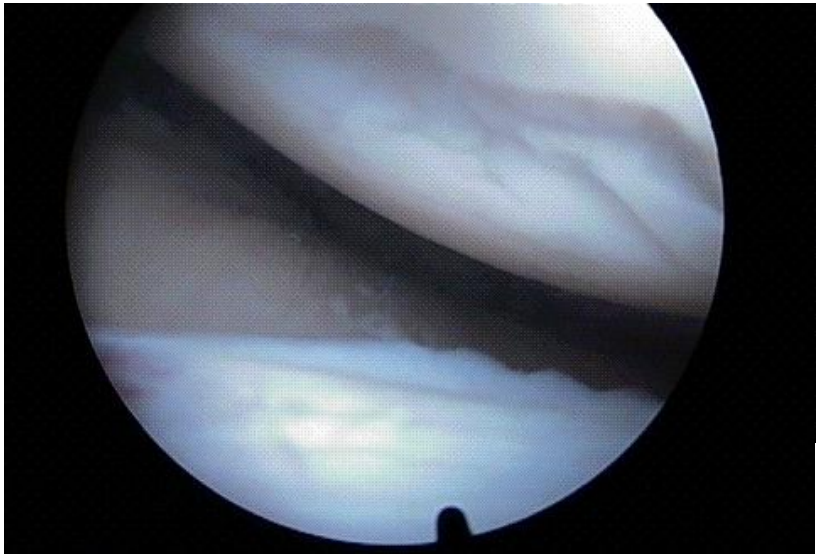
Meniscus US > Arthroscopy



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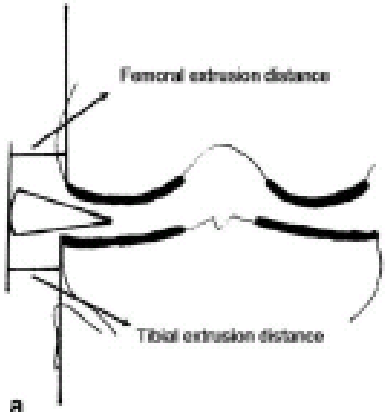
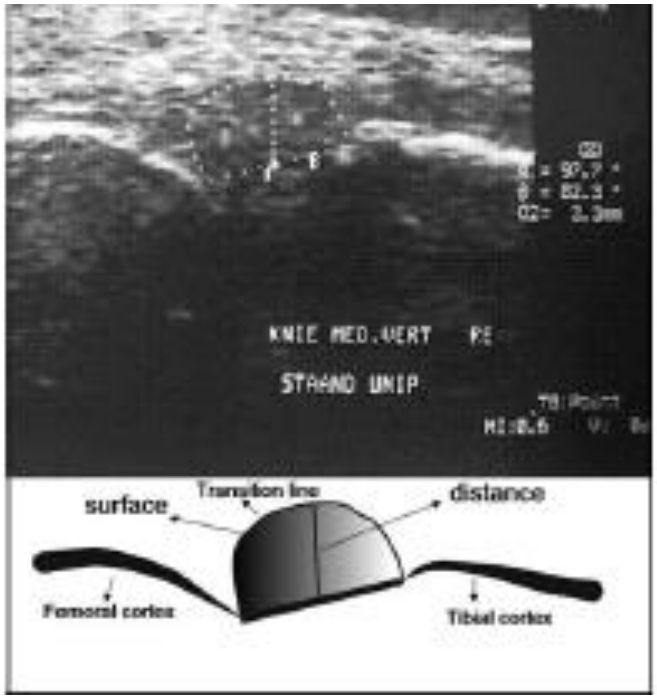
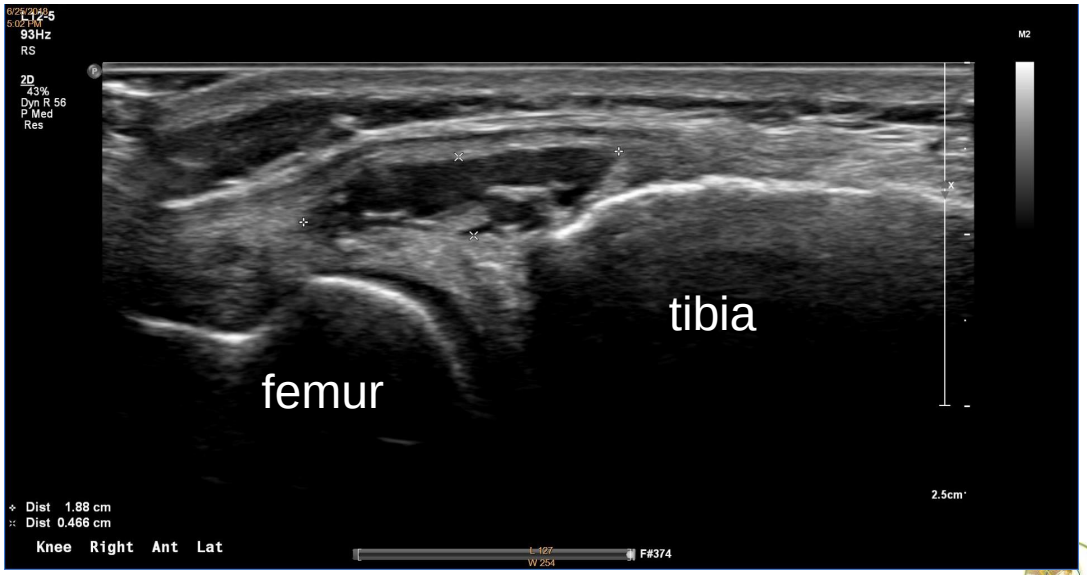
Meniscus signs

courtesy P Verdonk



- Lesion vs degeneration
- Protusion 3-4 mm
- Fluid / cyst formation





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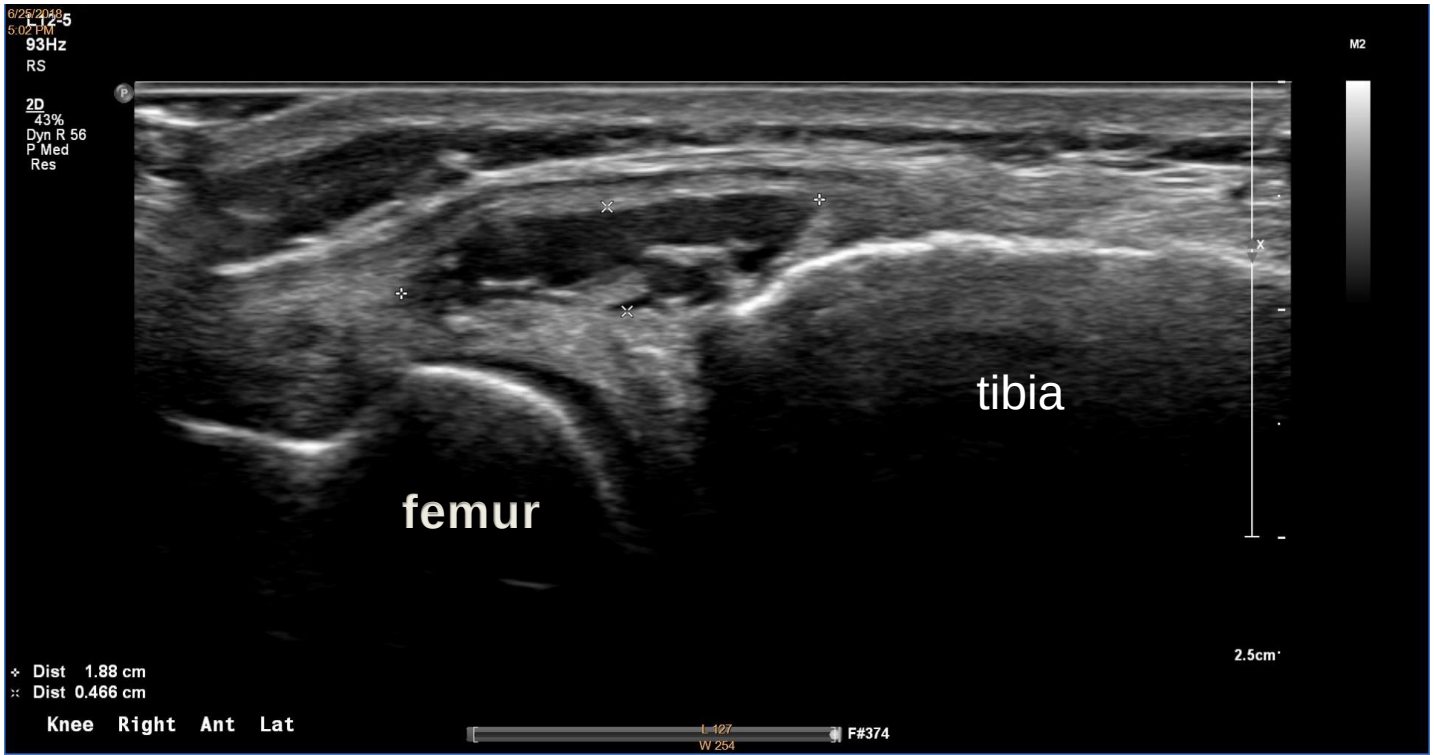
Meniscus cysts

- Lateral meniscus with radial tear .
- Outside layer of cyst (thick/thin) might predict need to resect the cyst wall .



Meniscus cyst intervention

punction ,
aspiration,
injection

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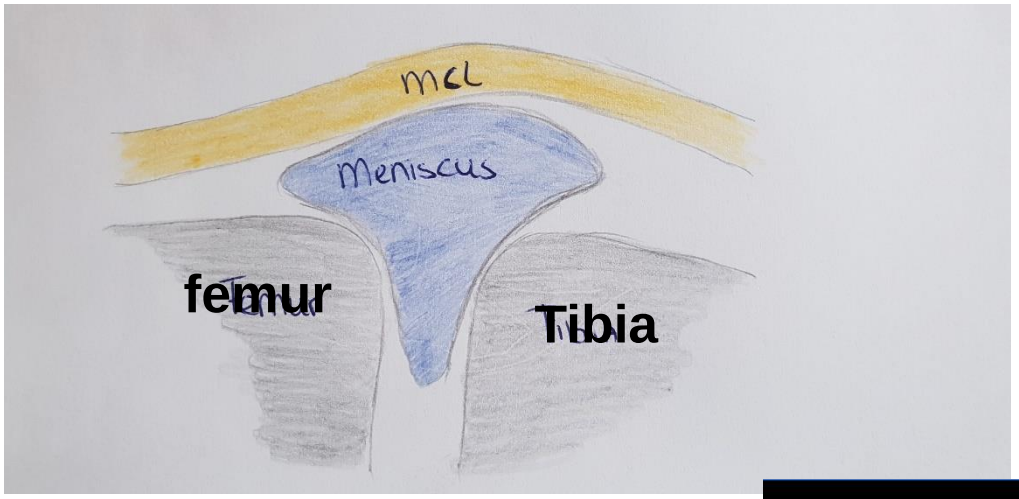
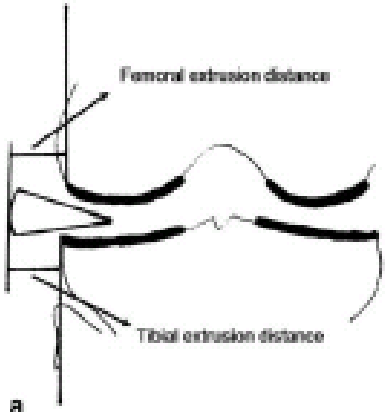
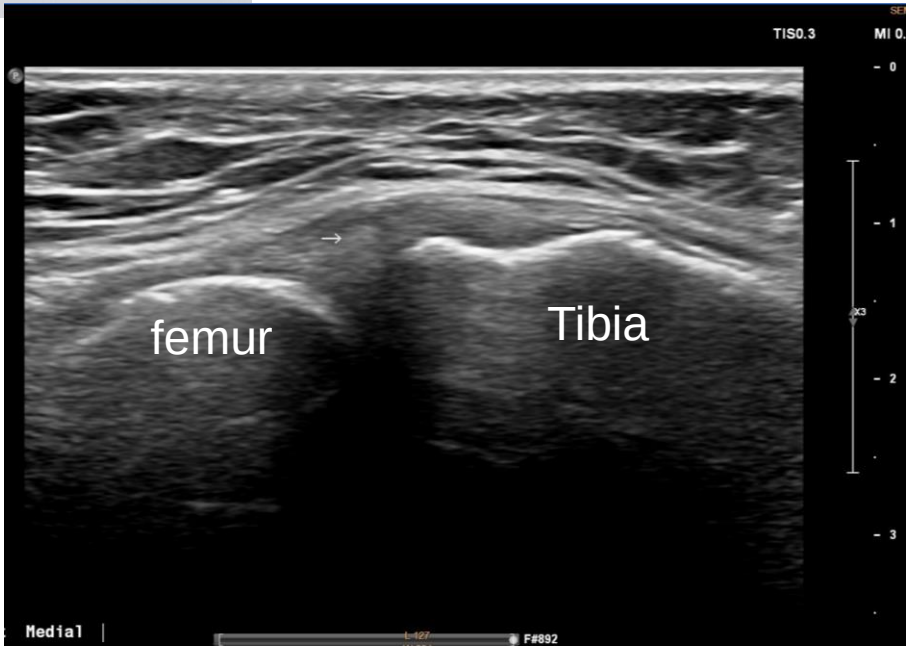
Meniscus extrusion







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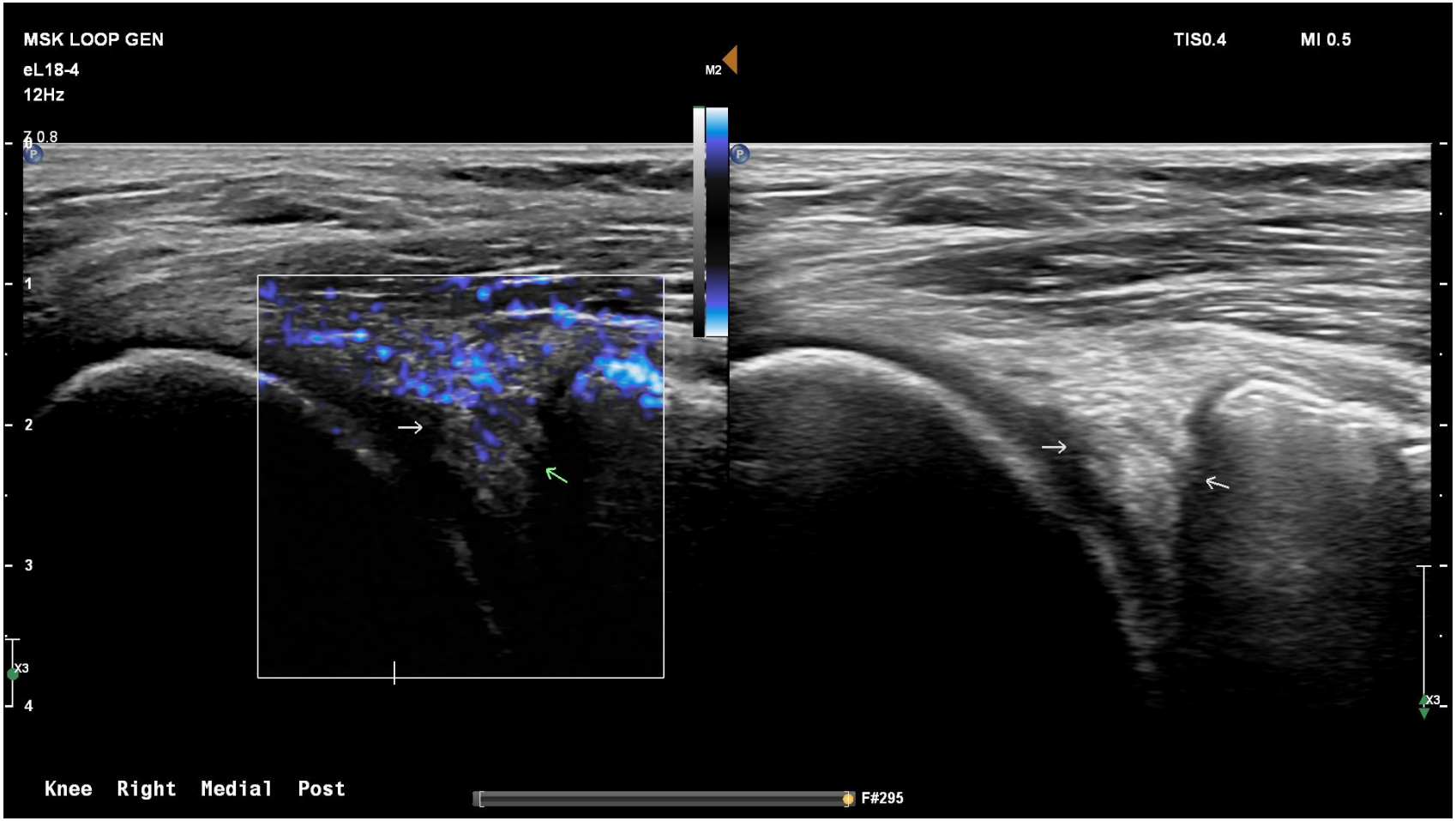
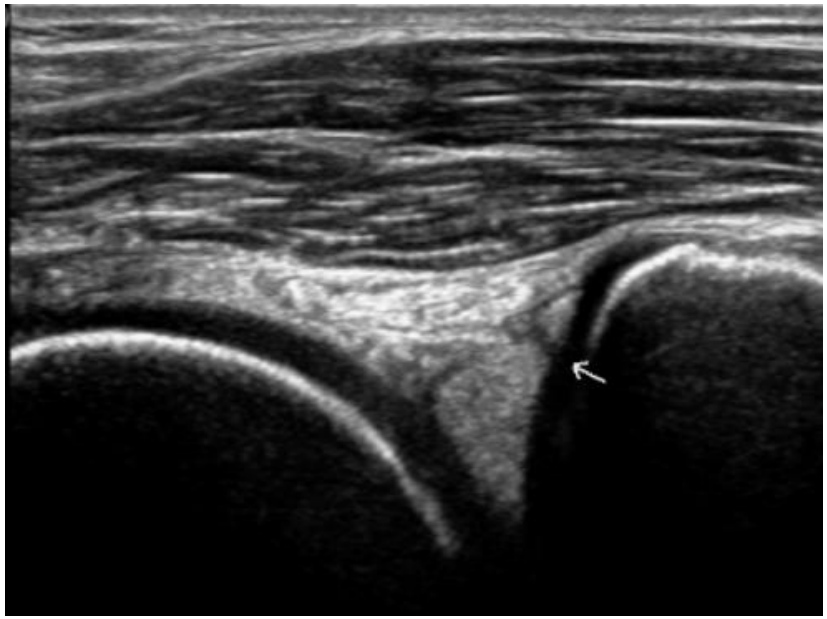
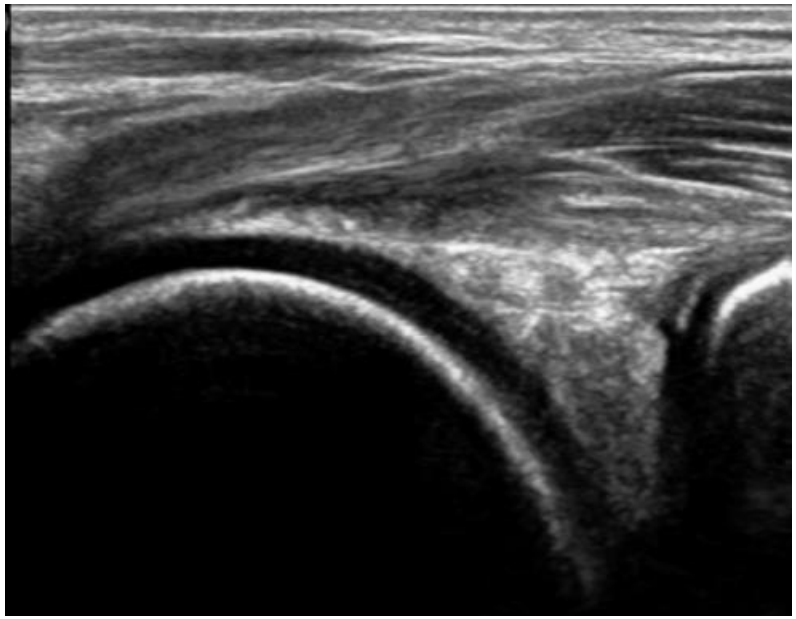
Meniscus vascularisation

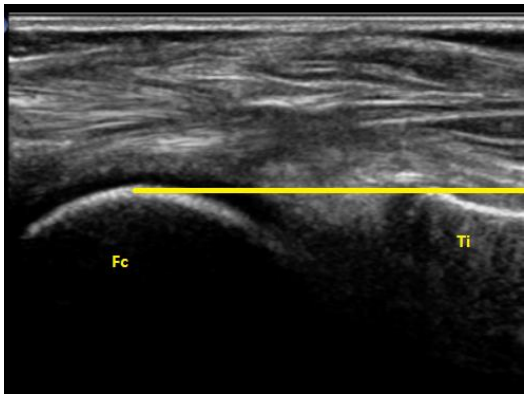


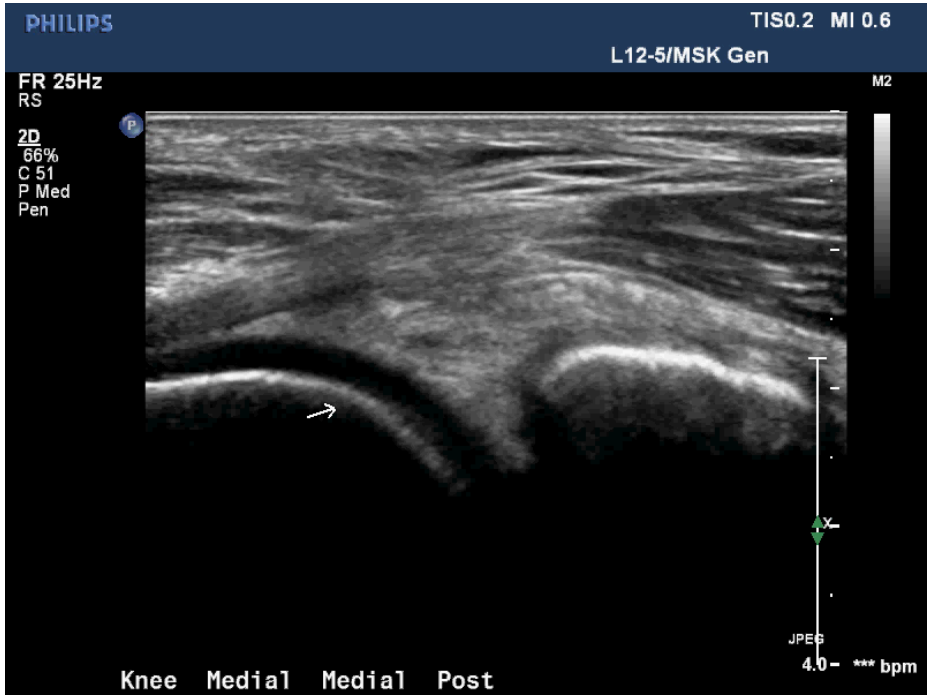
Sequential follow up in ACL / monitoring the meniscus @ 4 weeks conservative treatment





Meniscus / ACL def





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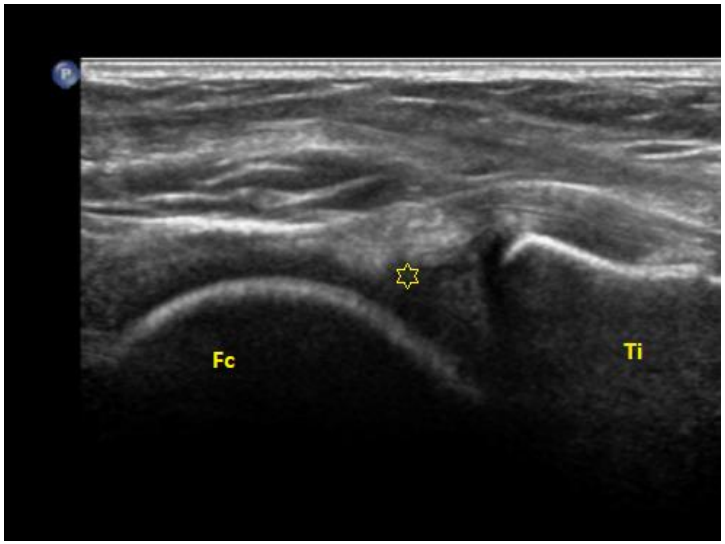
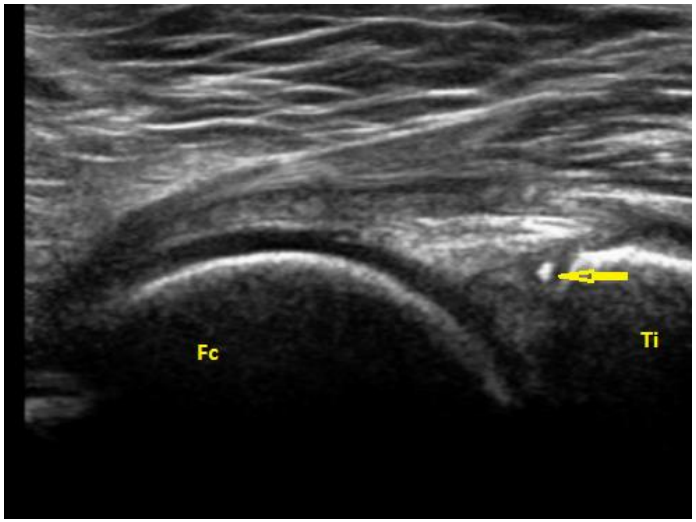
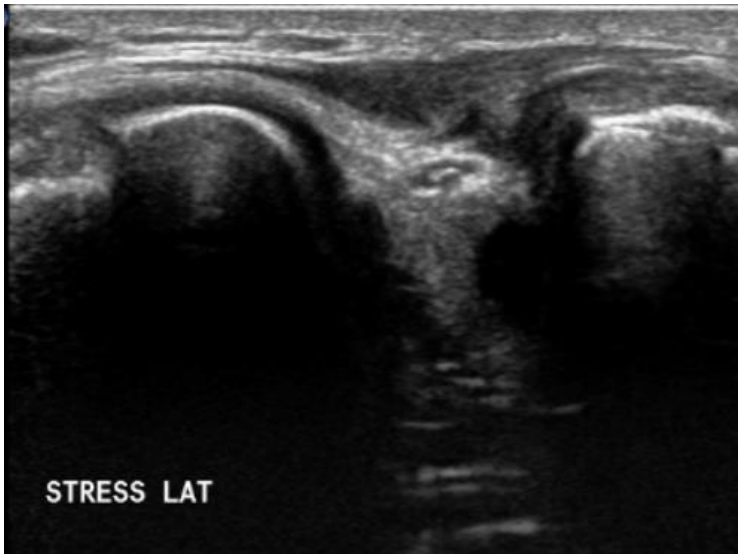
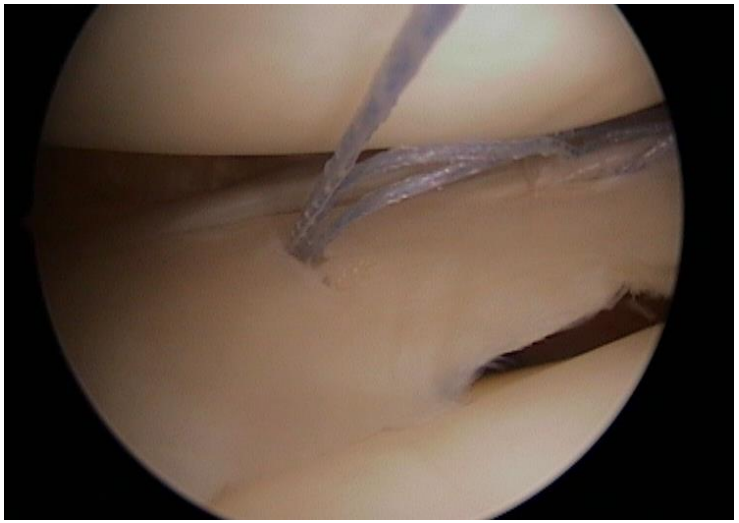
Meniscus repair follow up









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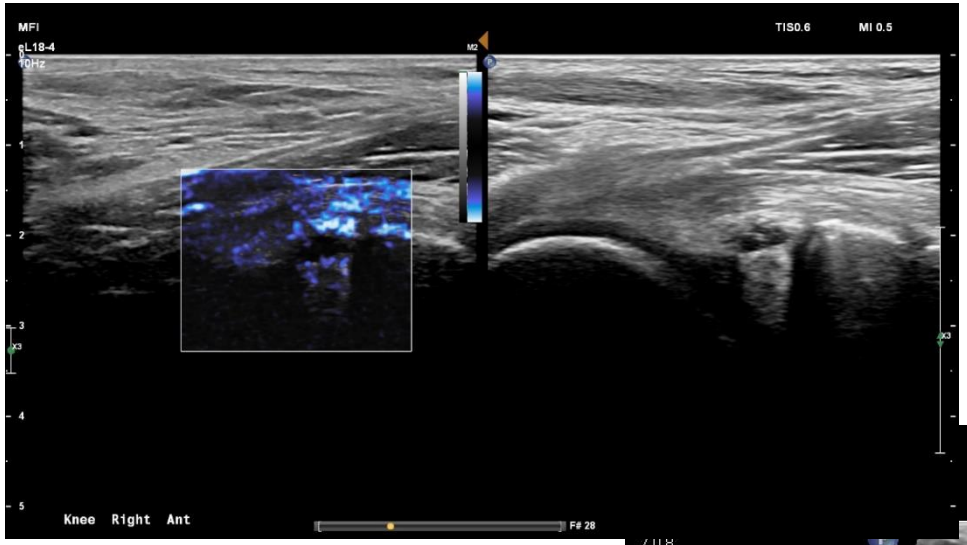
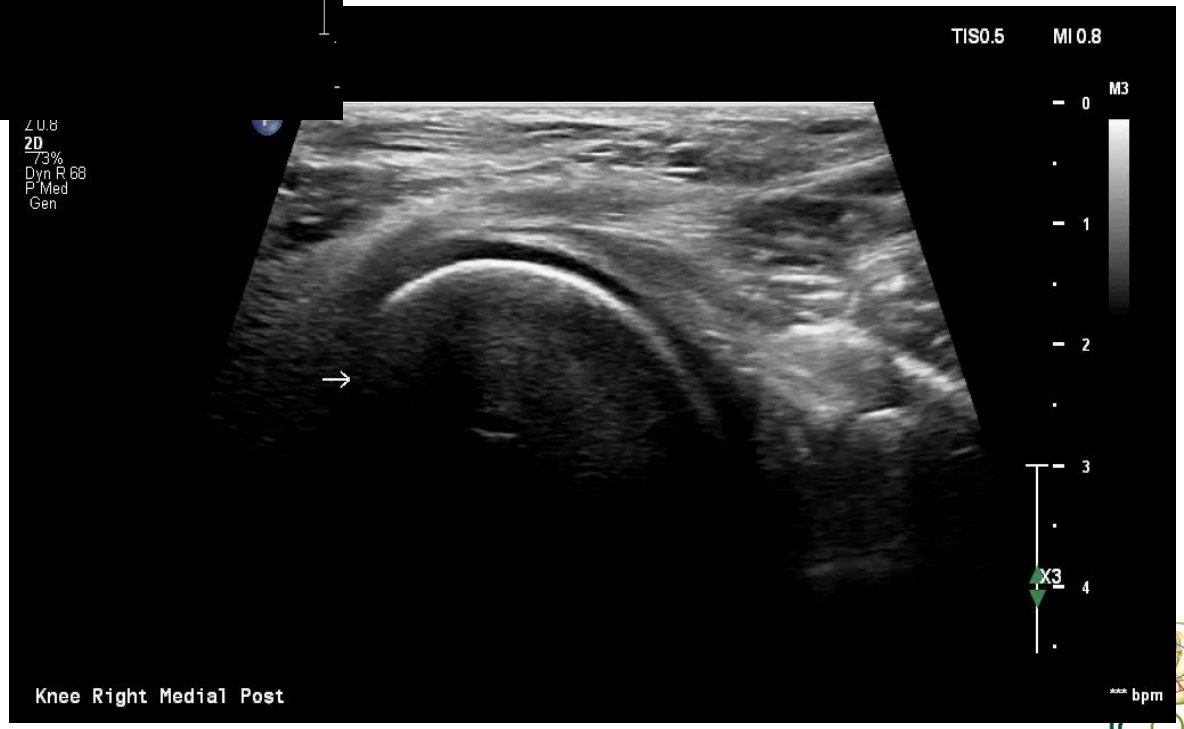
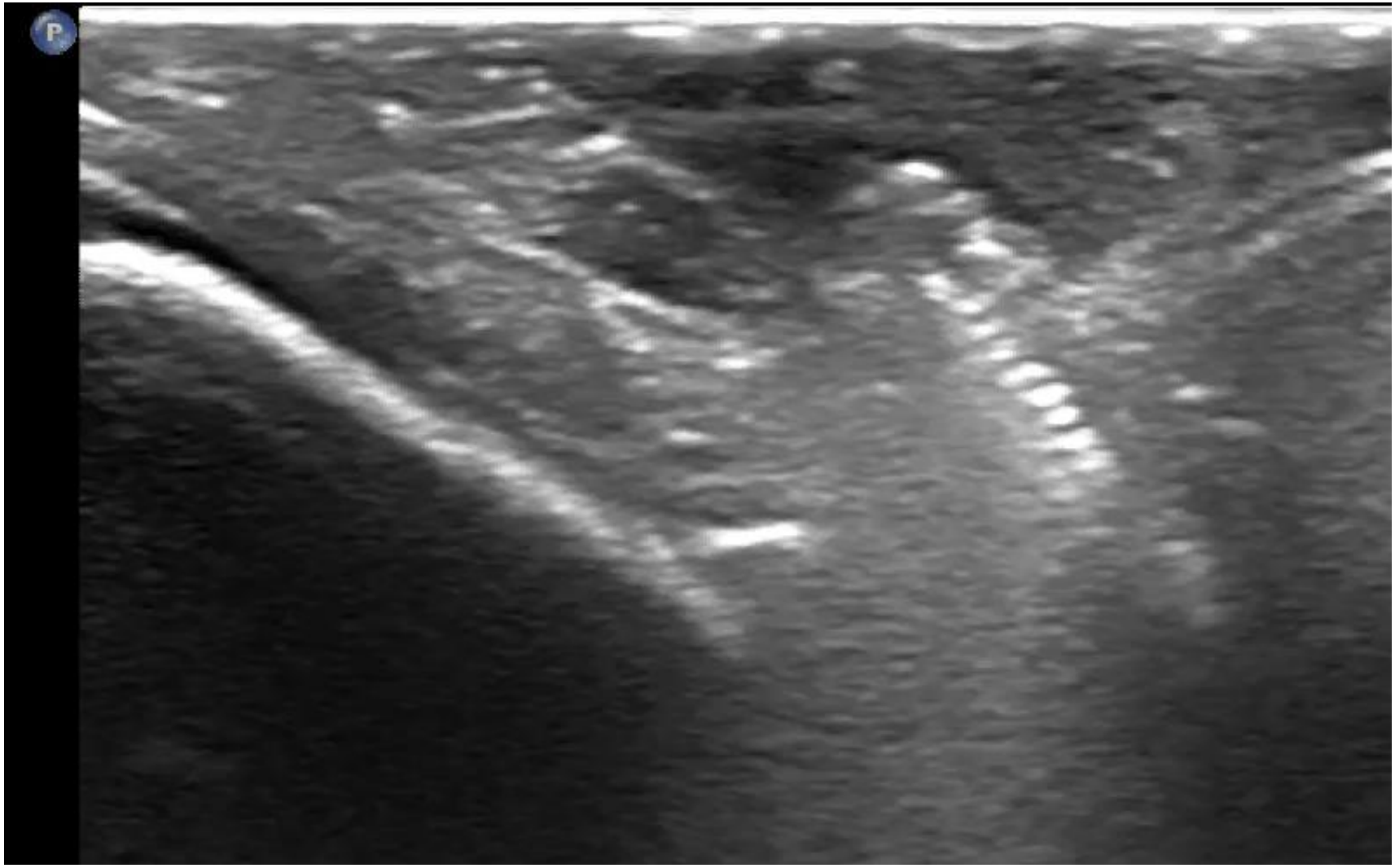
Meniscus trephination





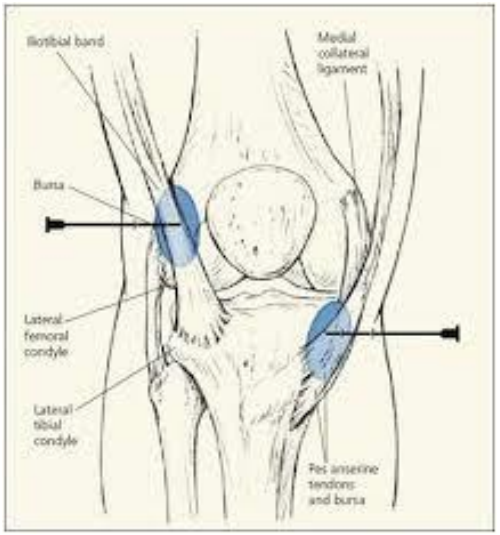
Meniscus Ramp lesion

Pig meniscus > repair



Post operative imaging

- Meniscus residual lesions ?
- Pes anserinus ?
- Healing repaired meniscus ?



- For these conditions MRI is not helpful in the short term (0-3 months)
- We use dynamic HR ultrasound if there is any problem in rehab .

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Conclusion

- Dynamic HR ultrasound usefull for meniscus pathology especially :

- Instability combined cases
- Follow up , postoperative conditions
- Monitoring healing /conservative treatment
- Repairability (vascularisation)
- Intervention

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