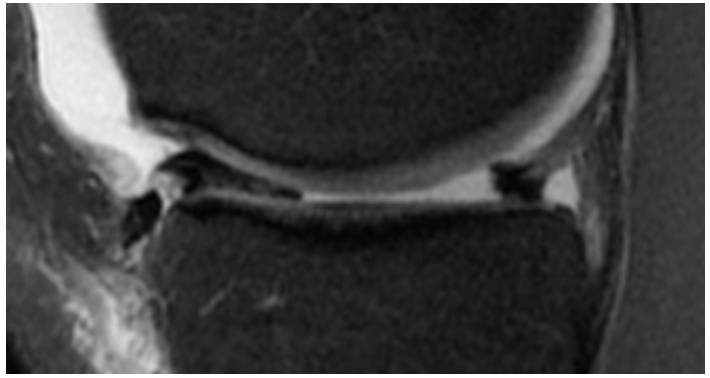
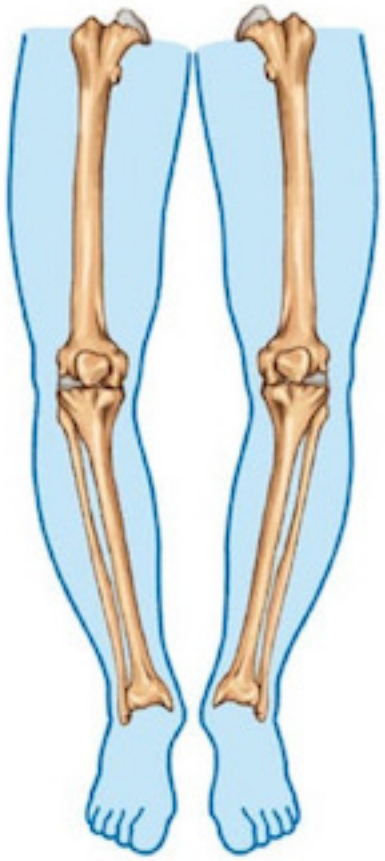
VARUS KNEE:

How to deal with medial meniscal tear WITHOUT OA





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FRANCE

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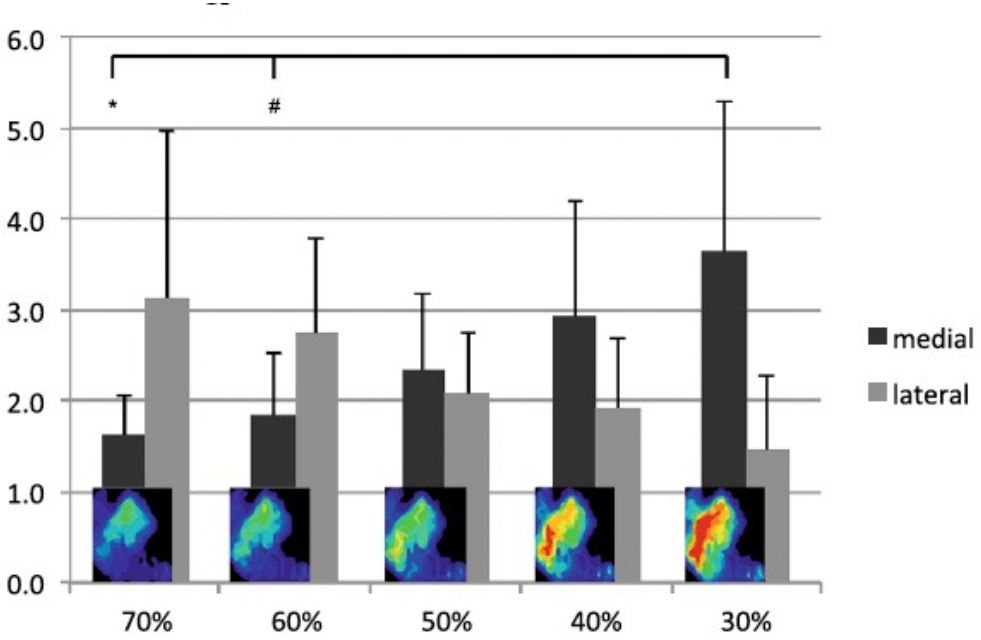
DOES VARUS MATTER? … Biomechanics

Medial Contact pressure increased in varus knees

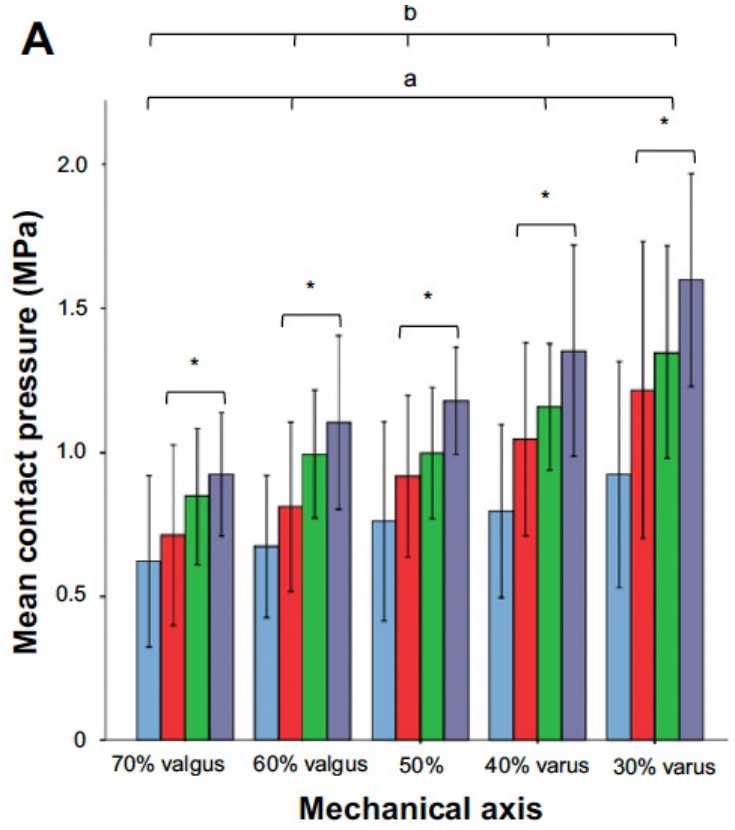
AND

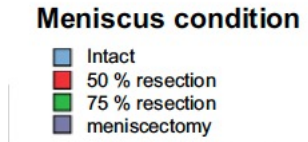
Significantly increased after meniscectomy



Varus alignment increases medial meniscus extrusion and peak contact pressure: a biomechanical study

Lukas Willinger[1] · Jan J. Lang[2,3,4] · Constantin von Deimling[2,6] · Theresa Diermeier[1] · Wolf Petersen[5] · Andreas B. Imhoff[1] · Rainer Burgkart[2] · Andrea Achtnich[1]





Knee Surgery, Sports Traumatology, Arthroscopy (2020) 28:1055–1063
https://doi.org/10.1007/s00167-019-05654-5

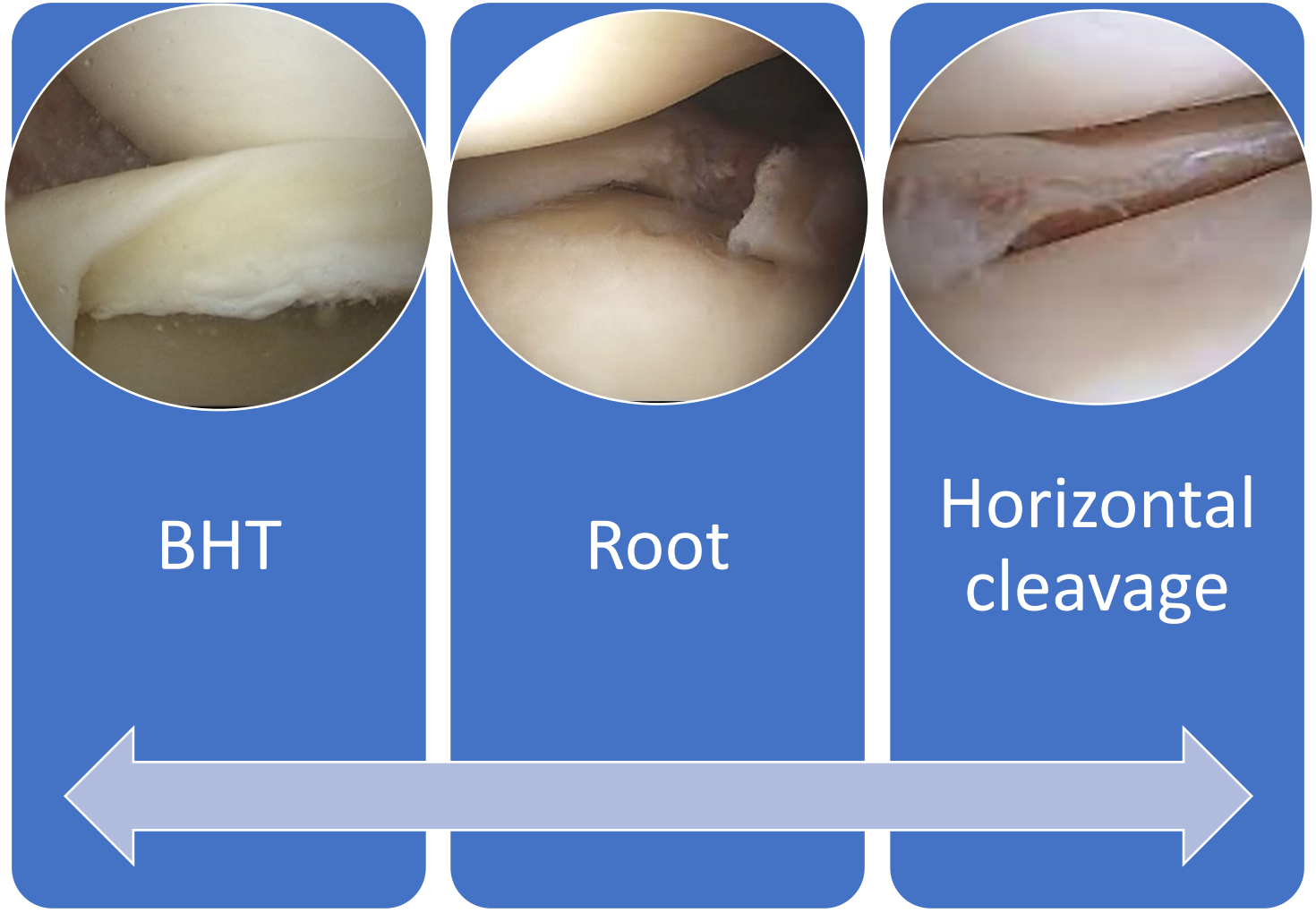
KNEE

Varus alignment aggravates tibiofemoral contact pressure rise after sequential medial meniscus resection

Lukas Willinger[1] · Jan J. Lang[2,3,4] · Daniel Berthold[1] · Lukas N. Muench[1] · Andrea Achtnich[1] · Philipp Forkel[1] · Andreas B. Imhoff[1] · Rainer Burgkart[2] · Constantin von Deimling[2,5]

Different situations

Lot of medial meniscal tears/lesions IN A STABLE VARUS KNEE



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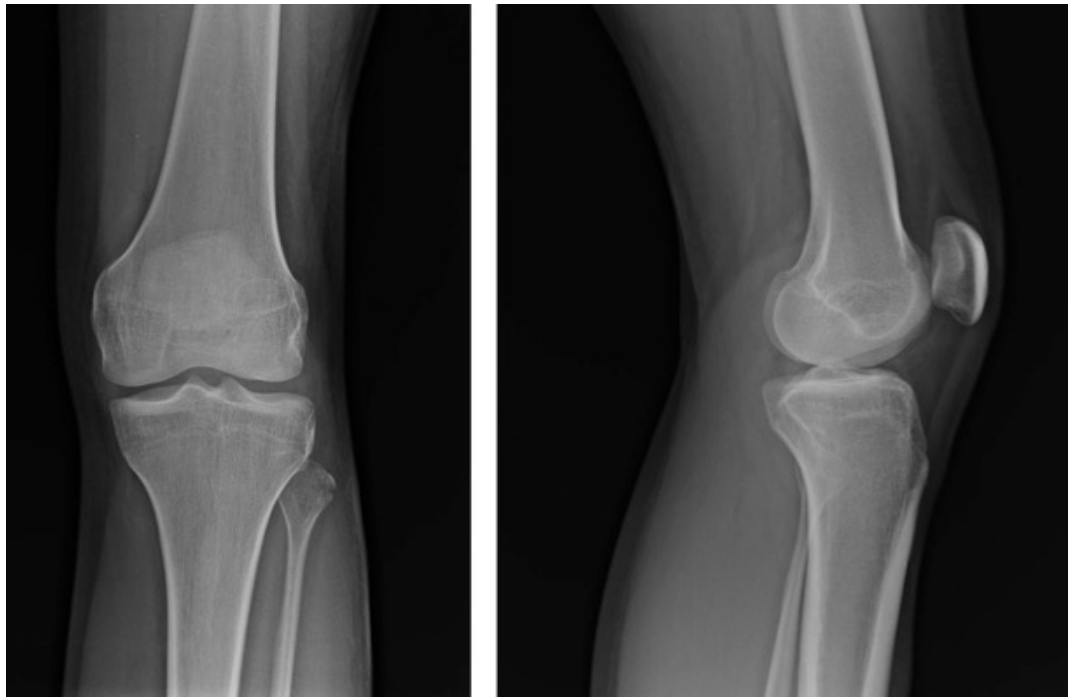
Case 1 Medial meniscus tear, stable knee, Varus

Man, 32 y

- Left Knee pain since **3 months**
- Sudden onset
- Daily pain

- **Varus ++**
- 0-0-125
- Effusion ++
- No laxity
- **Medial pain**

- **BMI = 22**



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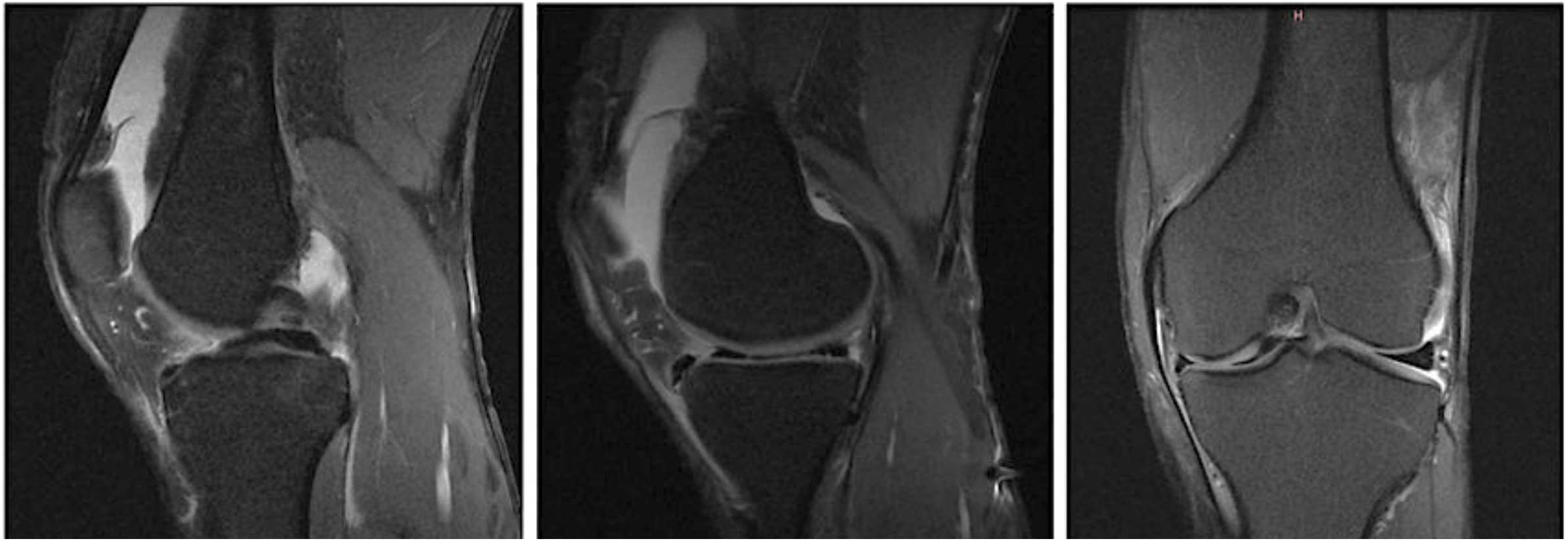
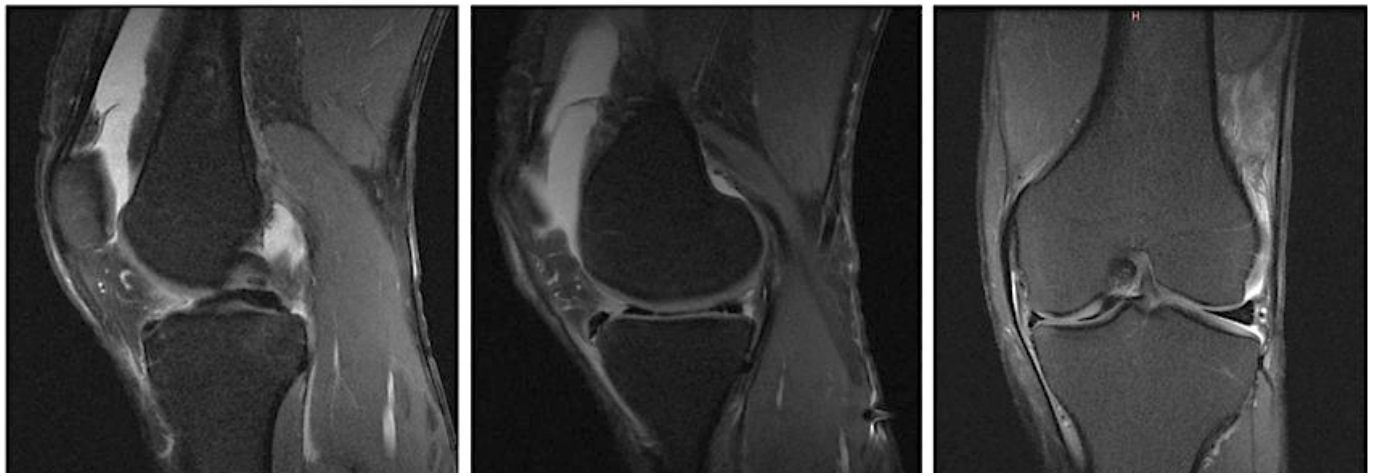
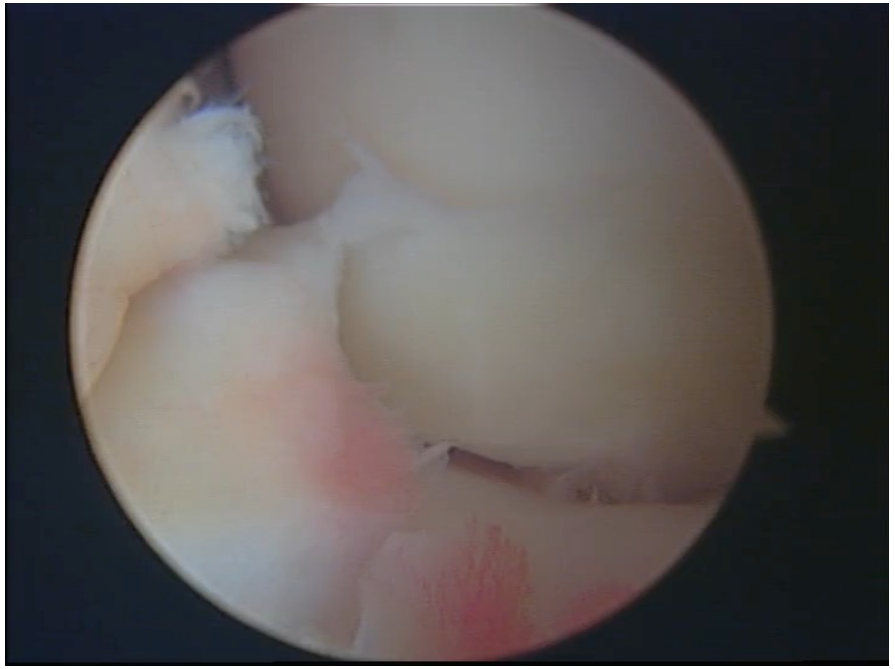
MRI



Versailles
Arthroscopie
Orthopédie
VAO

MRI/LLSXR





HKA 174

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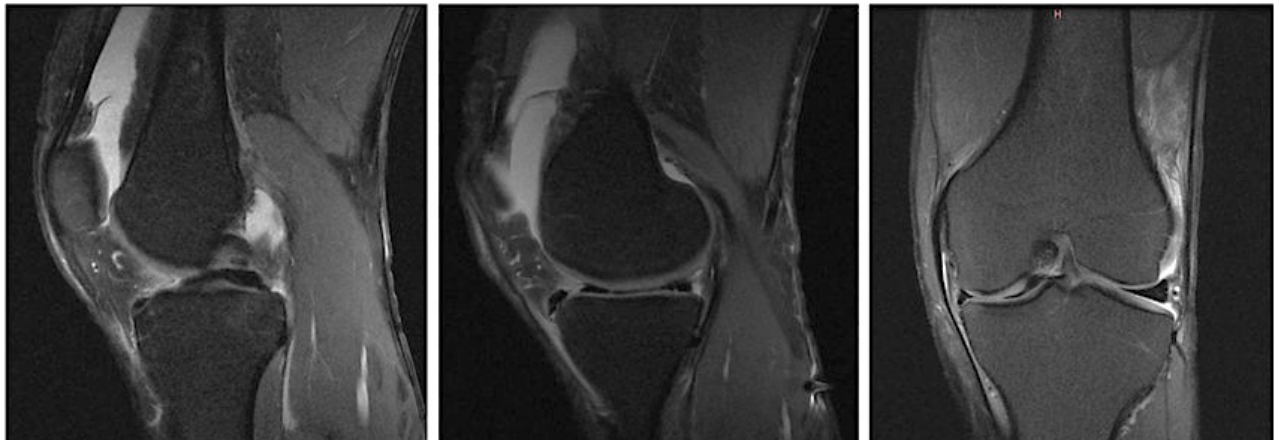
MRI/LLSXR



Meniscus repair, stable knee !

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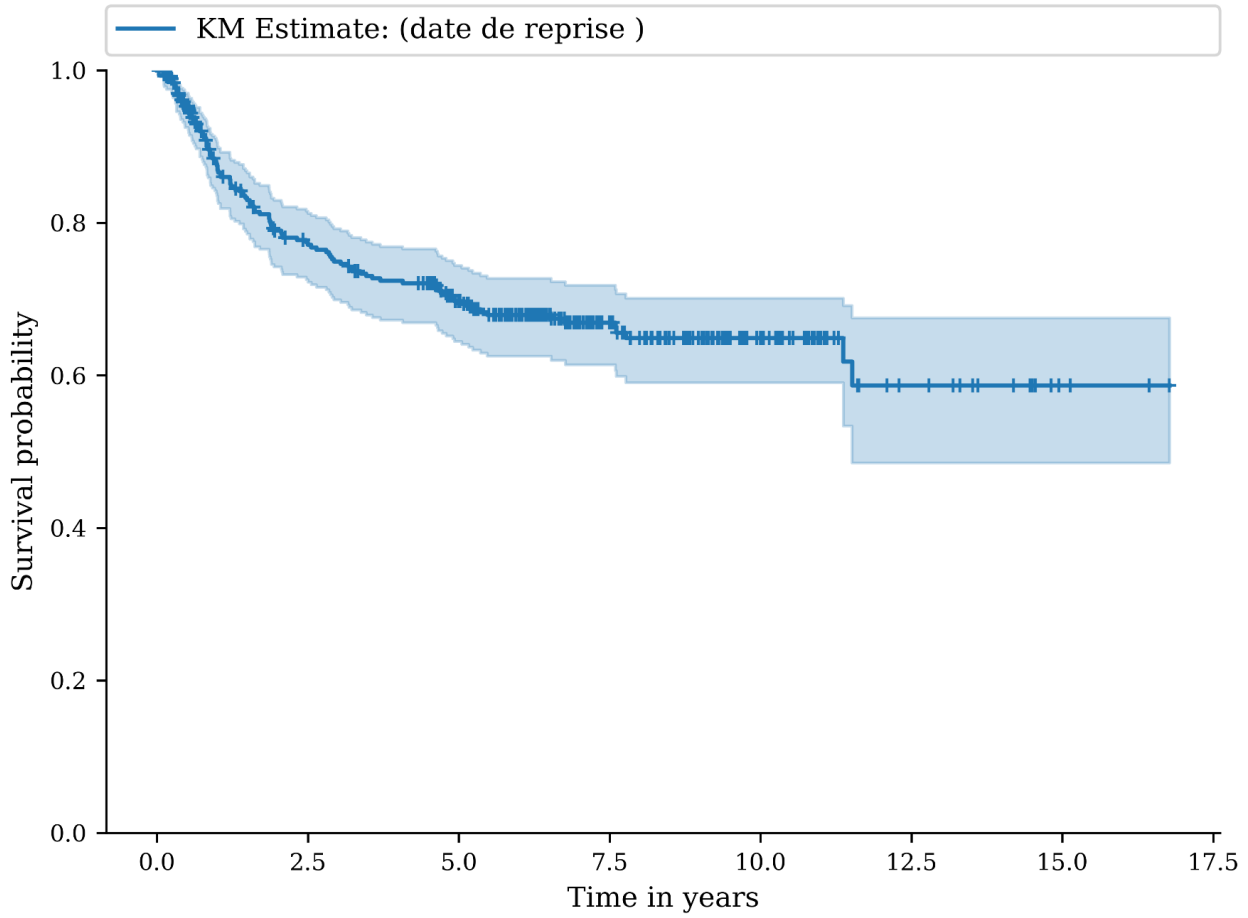
Medial meniscus repair on a stable knee??

- 377 patients
- Mean FU 6,5 y (+/- 3,5)
- Risk of failure?
- Survivorship:
  - At 2 y: 79% [74,5-83]
  - At 5 y: 69,7% [64,5-74,5]
  - At 10 y: 64,9% [59,1-70,1]



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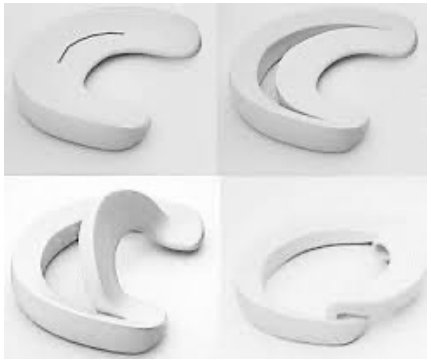
Bucket handle meniscal tear and varus deformity ?

- **Varus** = **Not a negative factor**

  - Meniscus repair
  - Stable knee



  - Negative predictive factors:

Age, Tobacco, type of lesion

Variable	No N = 216	Yes N = 114	p-Value
HKA			**0.093**
	178.94 (± 2.8)	179.91 (± 1.82)	
	Range: (172.0 ; 186.0)	Range: (176.0 ; 186.0)	
	N = 53	N = 32	

Results of the multivariate analysis

	Odds Ratio	p-Value
Intercept	0.126 [0.00846 ; 1.89]	0.134
lésion chondrale ICRS Reference: 1 ou moins change reference		
2 ou plus	0.782 [0.305 ; 2.01]	0.609
tabac	1.49 [0.826 ; 2.69]	0.185
appui	3.6 [1.62 ; 7.98]	0.0016 **
attelle	2.83 [1.54 ; 5.2]	7.76e-4 ***
BMI Risk for each 1-unit increase	1 [0.907 ; 1.11]	0.935
Anse de seau	1.71 [1.02 ; 2.89]	0.0437 *
Age at inclusion (years) Risk for each 1-unit increase	0.966 [0.939 ; 0.993]	0.0153 *
Gender Reference: M change reference		
W	1.39 [0.763 ; 2.53]	0.282

* p<0.05 ** p<0.01 *** p<0.001 **** p<0.0001

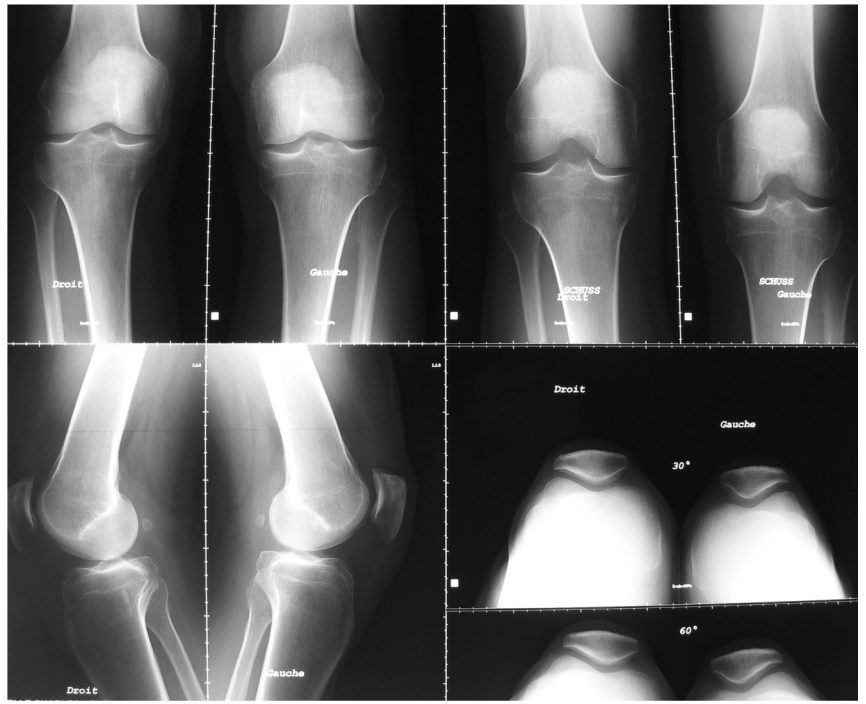
Case 2 medial Root tear, Varus knee

Man, 54

- Leftg Knee pain since **4 years**
- Sudden onset
- Daily pain
- Medical treatment (injections and physio) : failure

- **Varus ++**
- 0-0-125
- Effusion ++
- No laxity
- **Medial pain**

- **BMI = 28**



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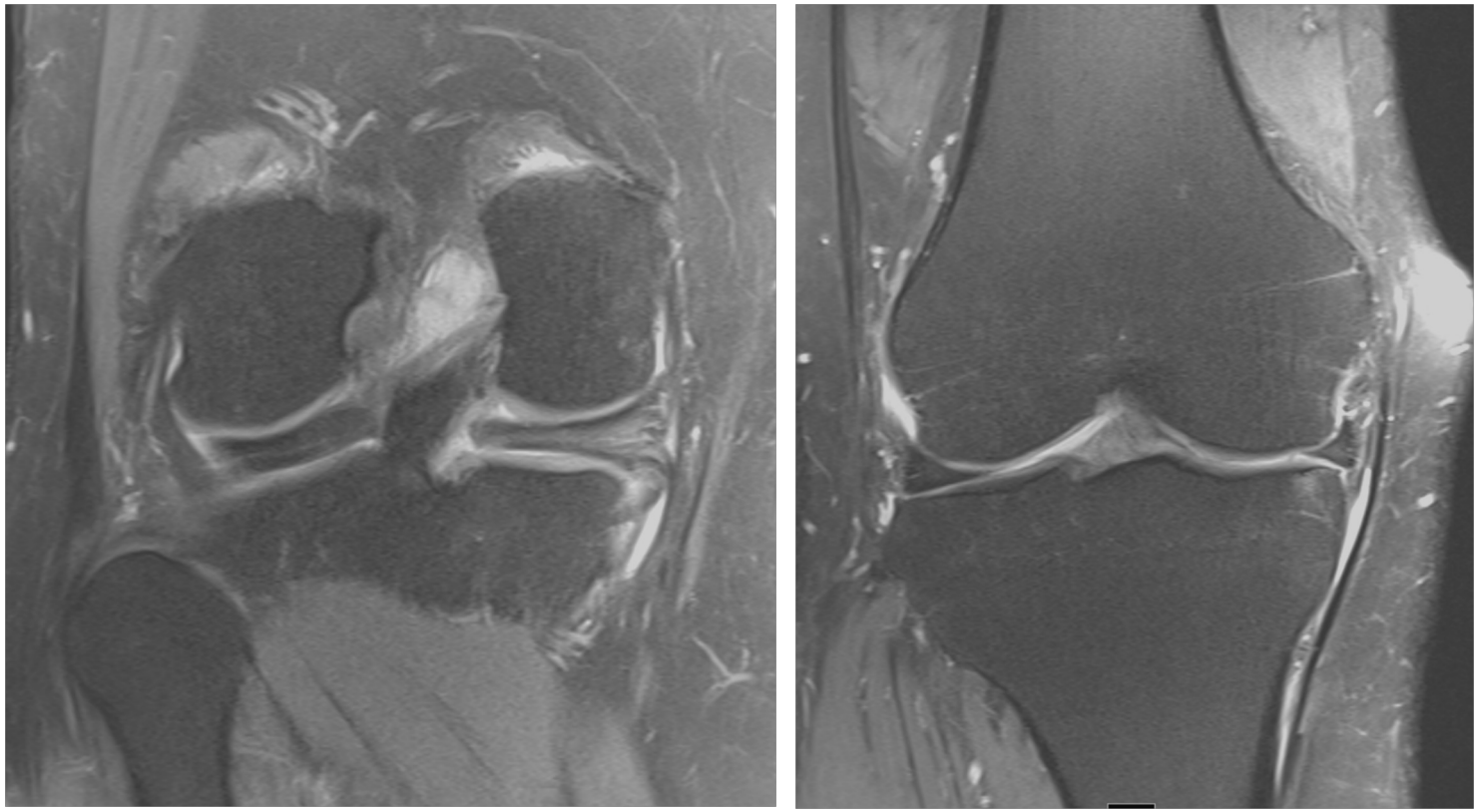
MRI

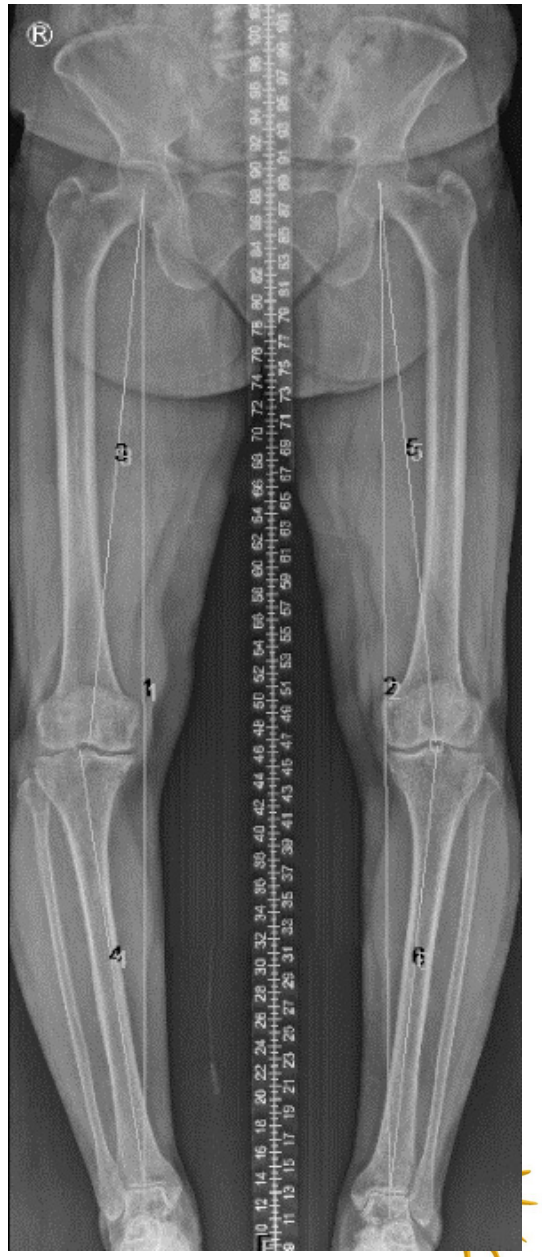


Extrusion = **2.5 mm**

HKA

Right: **169°**

Left:171°



Root tear and varus ?

- **Varus > 5°** = **Negative predictive factor**[1]

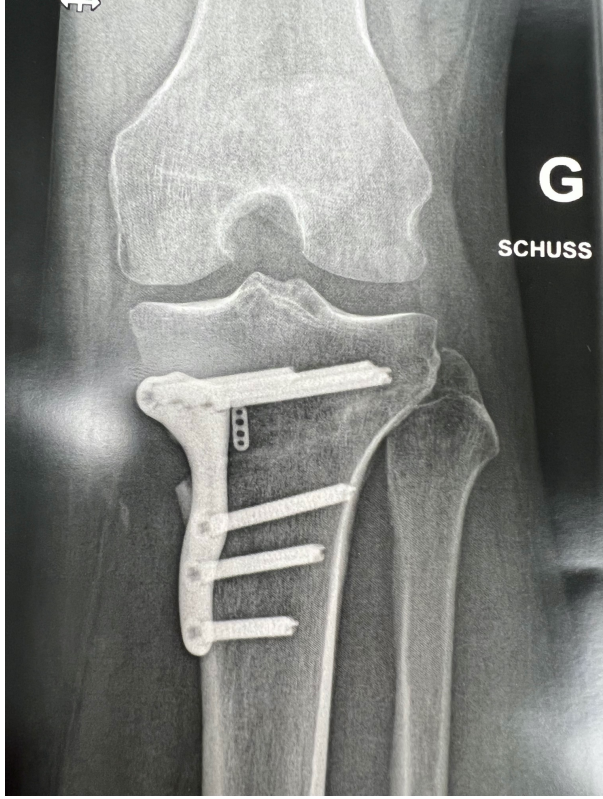
  - Osteotomy + repair = **good results if no advanced OA**[2]

Remodified Mason-Allen suture technique concomitant with high tibial osteotomy for medial meniscus posterior root tears improved the healing of the repaired root and suppressed osteoarthritis progression

Young Mo Kim [1], Yong Bum Joo [2], Woo Yong Lee [1], Yun Ki Kim [1]

17 patients at 5 y

MME 3mm ±0,7
BMI < 30
KL ≤ 2
Varus 6° ±1,8



  - Osteotomy with Vs without root repair [3-6]

    - Comparatives studies
    - **No significant difference**

Chronic Lesions
KL 3-4

1.Jiang. The knee. 2019
2.Kim YM. KSSTA 2020
3.Takahashi. J Orthop Sci. 2020
4.Le OS. Knee 2018
5.Ke. KSSTA 2020
6.Le DW. Arthroscopy 2020

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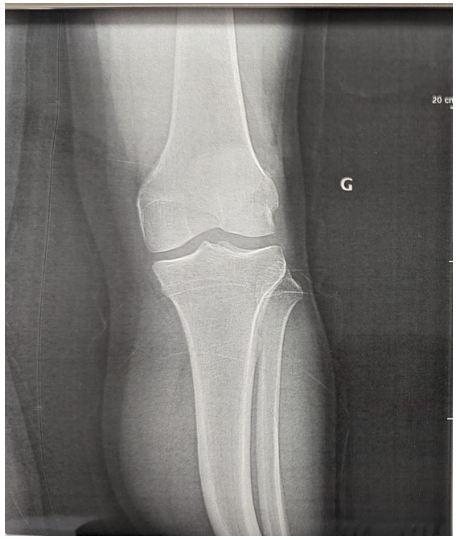
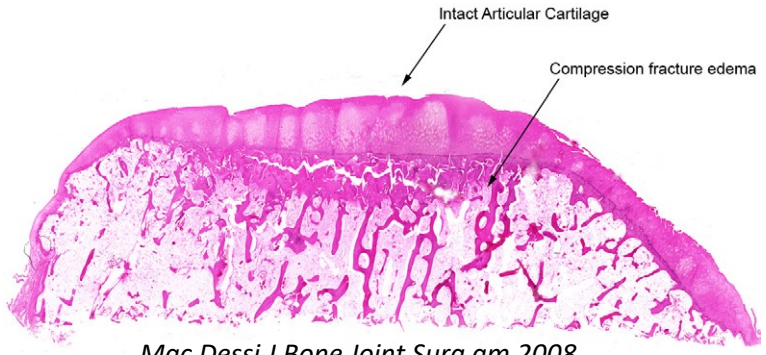
Root tear without OA: high risk of:

- AVN of the femoral condyle
- Subchondral Fracture
- Rapid chondrolysis

➢ <u>Early treatment if possible</u>





Mac Dessi J Bone Joint Surg am 2008

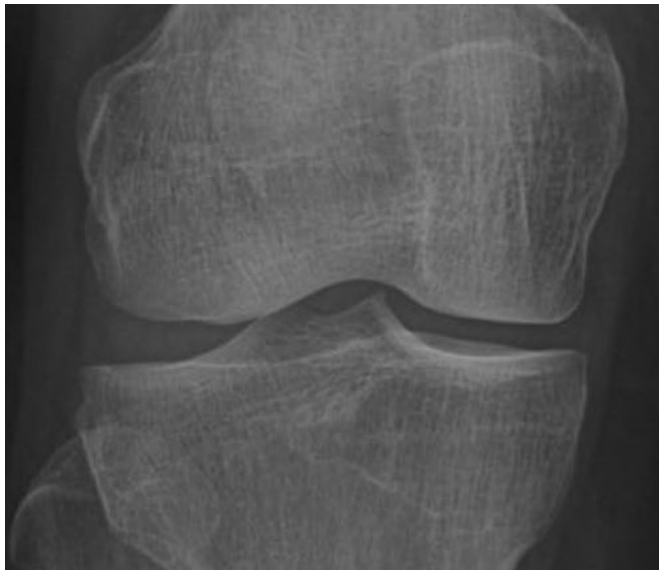
Case 3

Woman, 59

- Right Knee pain since **2 months**
- Sudden onset
- Moderate pain

- **Varus ++**
- 0-0-130
- Effusion +
- No laxity
- **Medial pain**

- **BMI = 25**



No OA

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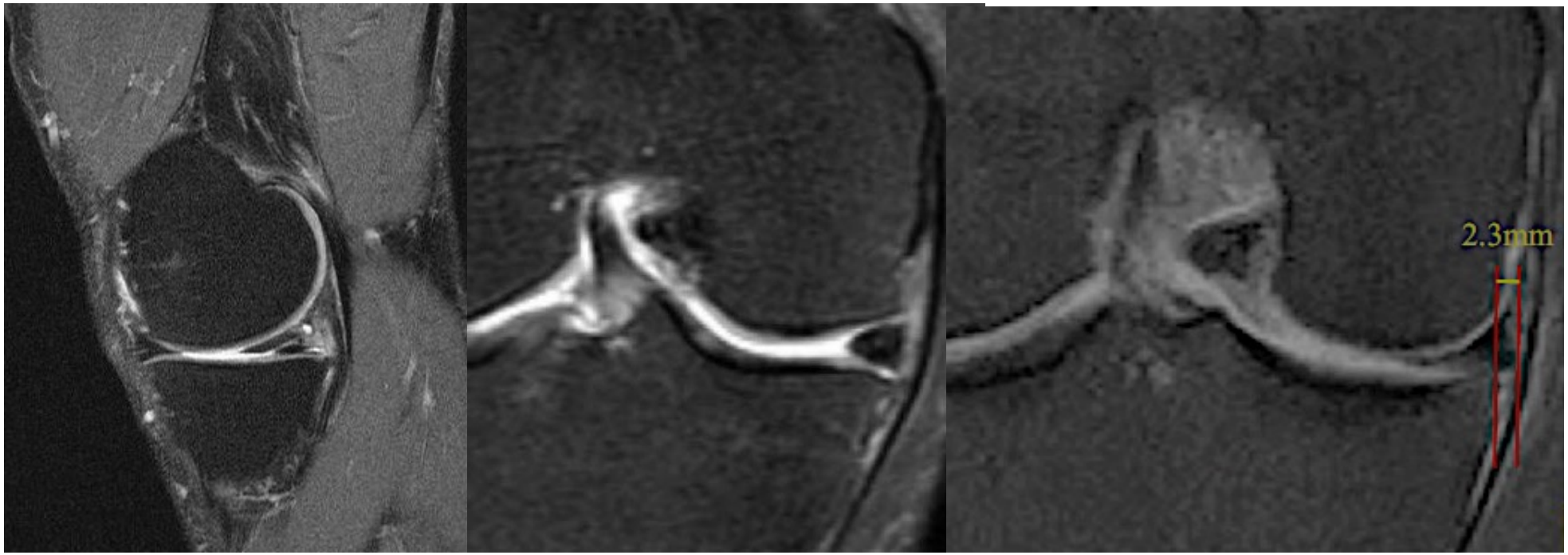
MRI/LSXR



HKA

Right: **173°**

Degenerative Horizontal lesion and varus ?

- **Varus** = **Negative predictive factor**

Xu et al.
Journal of Orthopaedic Surgery and Research (2022) 17:170
https://doi.org/10.1186/s13018-022-03045-0

Journal of Orthopaedic Surgery and Research

RESEARCH ARTICLE Open Access

Large medial meniscus extrusion and varus are poor prognostic factors of arthroscopic partial meniscectomy for degenerative medial meniscus lesions

Tao Xu, Liuhai Xu, Xinzhi Li and You Zhou*

426 patients at 3 y

Continuous variables*	Coefficient	*P*
Preoperative factors		
Age, y	− 0.586	0.000
BMI	0.013	0.906
HKA, °	0.822	0.000
MPTS, °	− 0.211	0.051
MME, mm	− 0.794	0.000

Dependent variables	Significant variables	OR	*P* value	95% CI
Lysholm, fair or poor[&], *n* = 37	Age, y	1.109	0.050	1.102–1.232
	HKA, °	0.255	0.000	0.131–0.499
Progression of K–L grade, *n* = 38	MME	10.327	0.000	4.009–26.602

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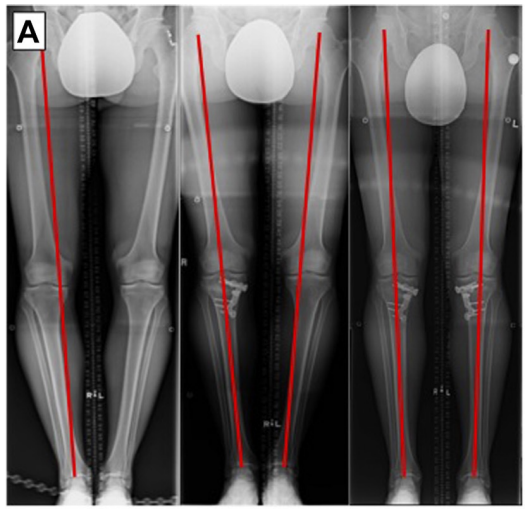
HTO if DML without OA and Varus????? NO !

Degenerative Meniscal Tears and High Tibial Osteotomy

Do Current Treatment Algorithms Need to Be Realigned?

Codie A. Primeau, MSc[a,b,c], Trevor B. Birmingham, PT, PhD[a,b,c], Kristyn M. Leitch, PhD[a,b], C. Thomas Appleton, MD, PhD[b,d], J. Robert Giffin, MD, FRCSC, MBA[a,b,c,e,f,*]

Clin Sports Med 38 (2019) 471–482
https://doi.org/10.1016/j.csm.2019.02.010



Medial meniscus (right knee - HTO)

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Conclusion

- **VARUS: A DISEASE?**
  - Case by case +++
  - Do not miss out
  - Do not overtreat