



Osteotomy for the management of Knee ligament injuries



Ronald van Heerwaarden MD, PhD

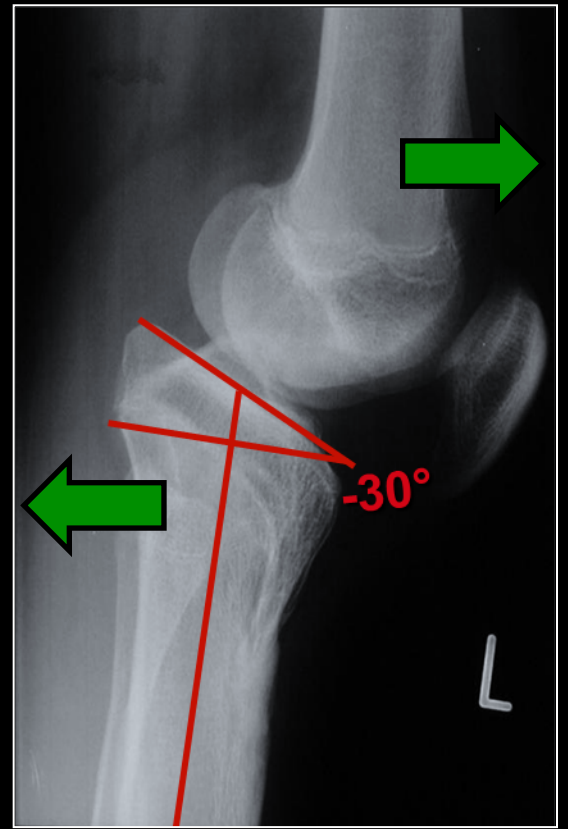


Outline

- Bone deformity and ligaments/instability
- Osteotomies for chronic lig. instability
- Timing / staging
- Conclusion



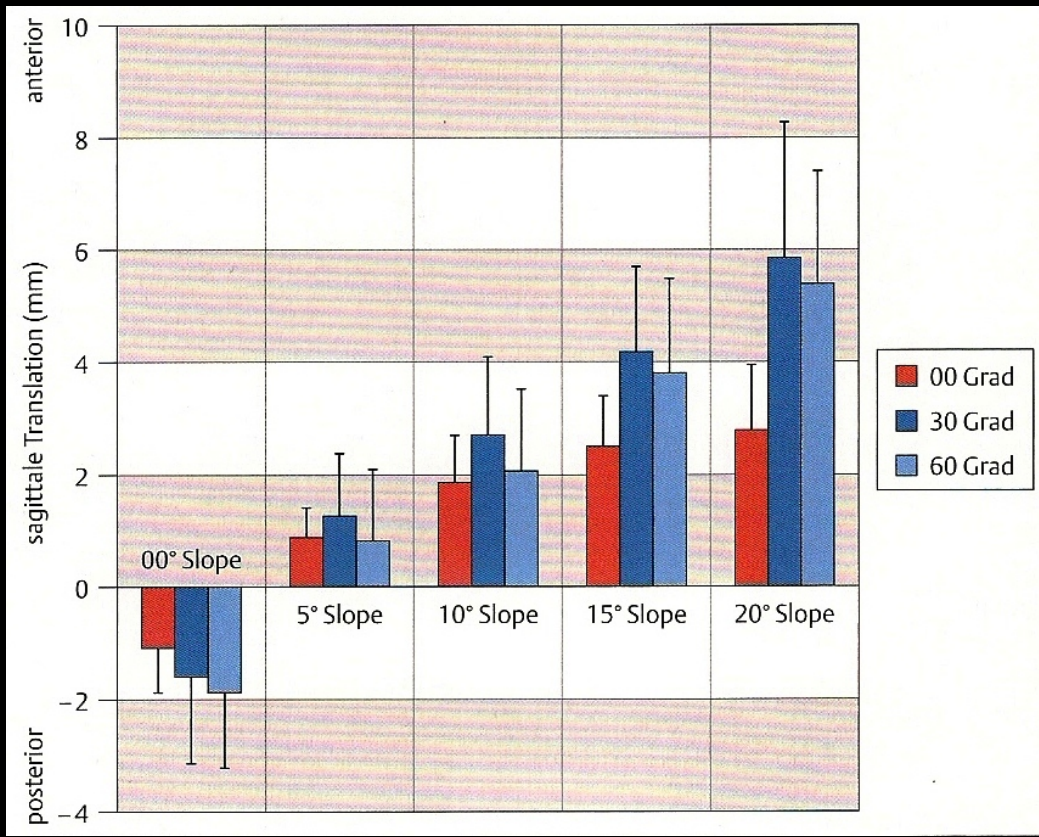
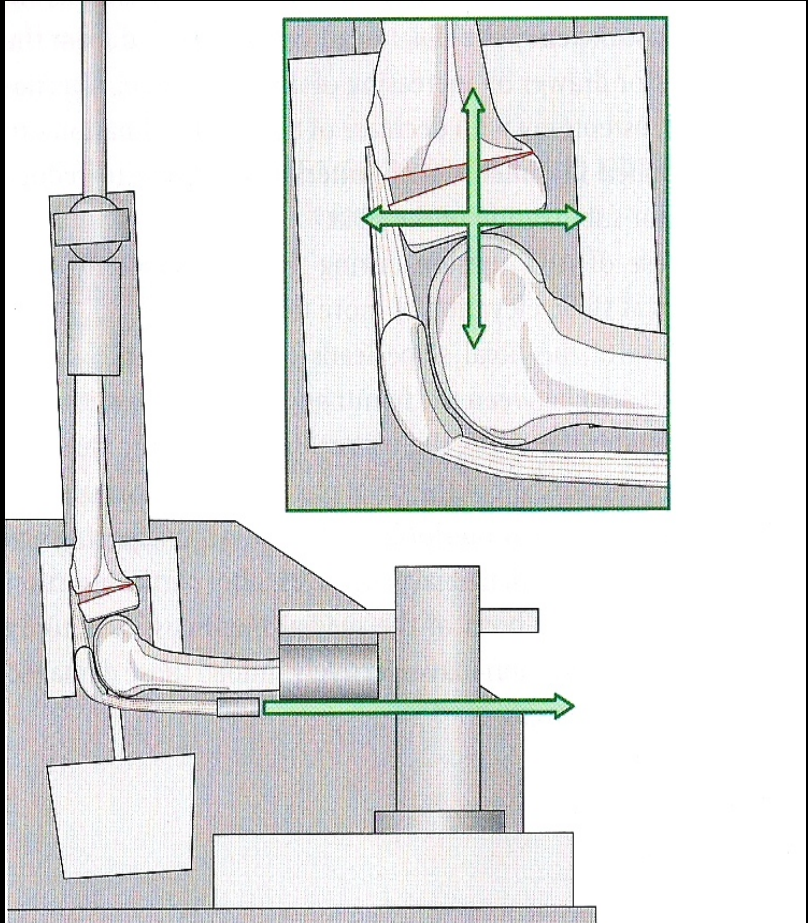
Posterior Sag



Recurvatum

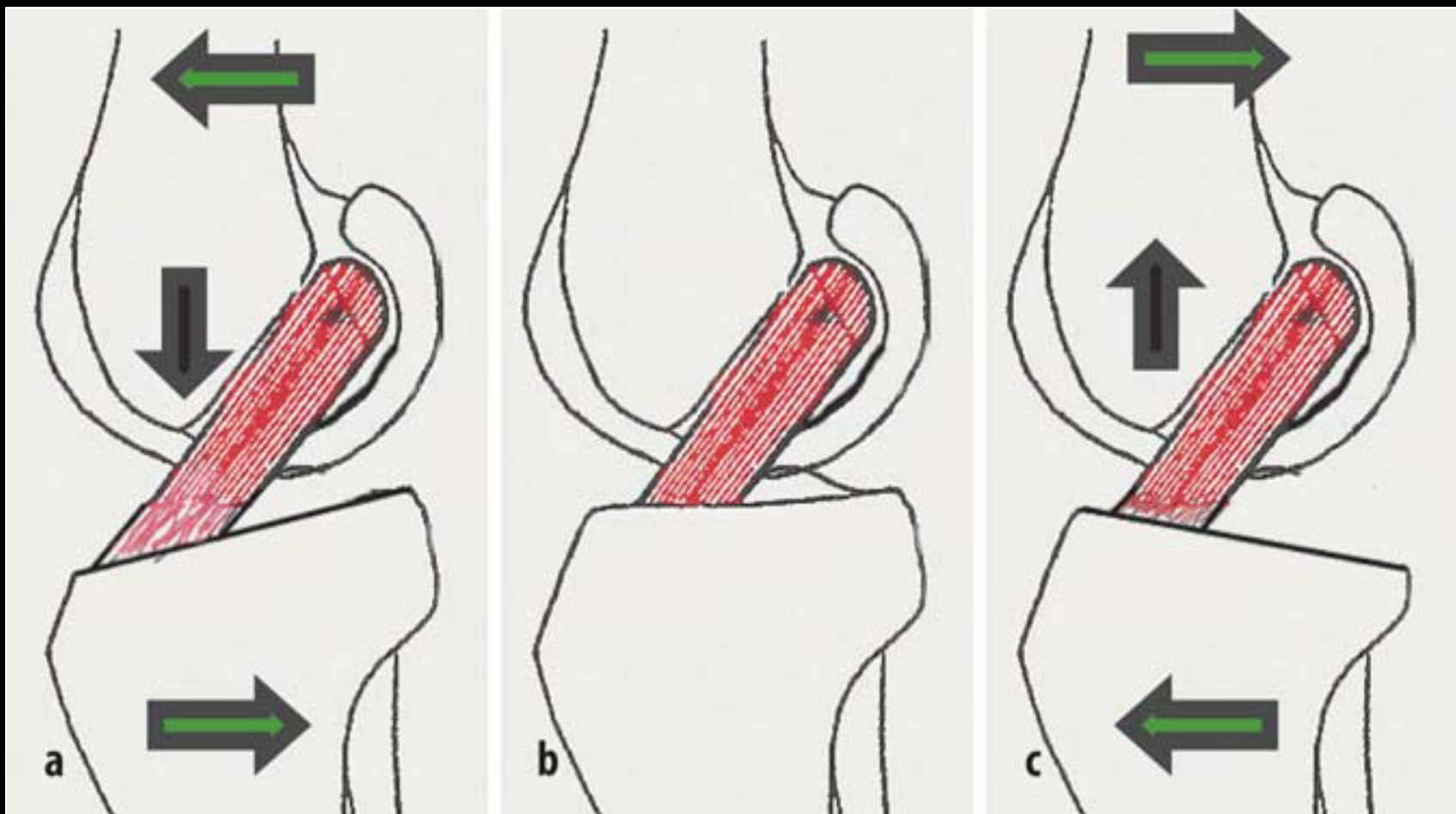
Effects of Tibial Slope

Posterior Cruciate Ligament cut



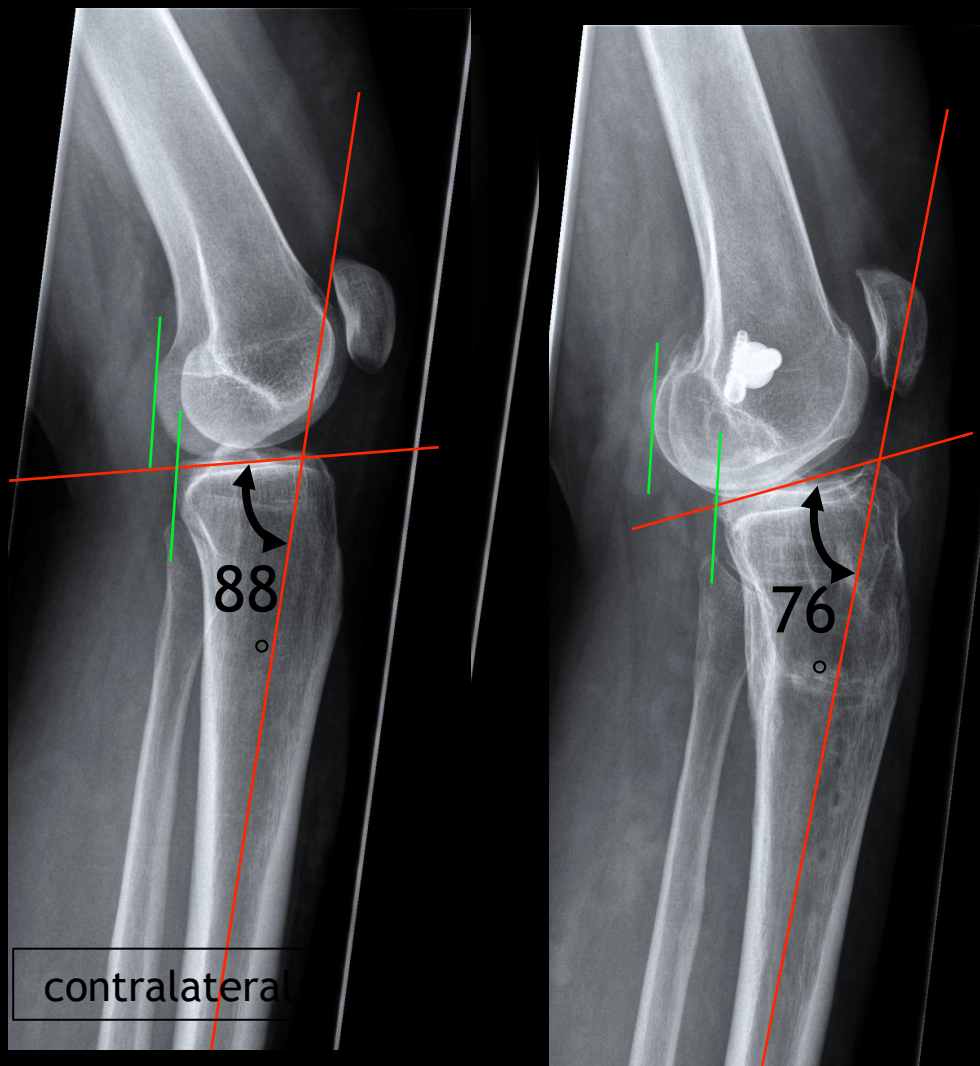
Agneskirchner JD. Arch Orthop Trauma Surg 2004; 124(9): 575-84.

Effects of Tibial Slope



Imhoff A. Orthopäde 2004; 33:201–207

Effects of Tibial Slope



39 yr F
Previous
HTO

3 failed ACL
reconstr.

The Impact of Osseous Malalignment and Realignment Procedures in Knee Ligament Surgery

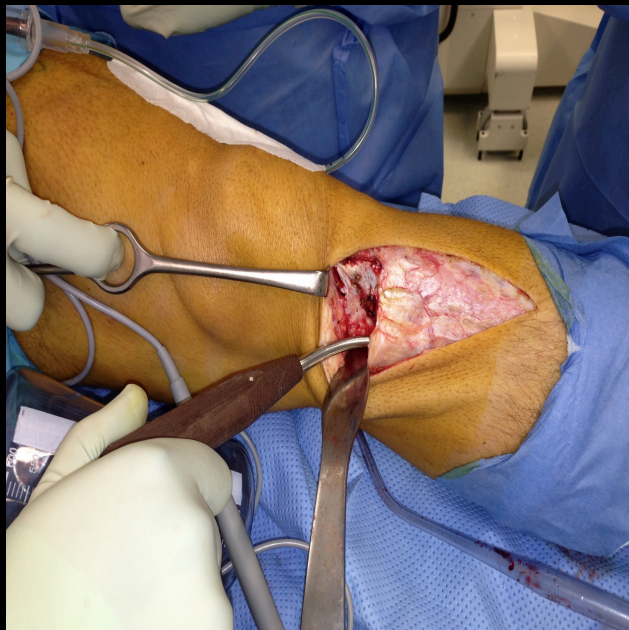
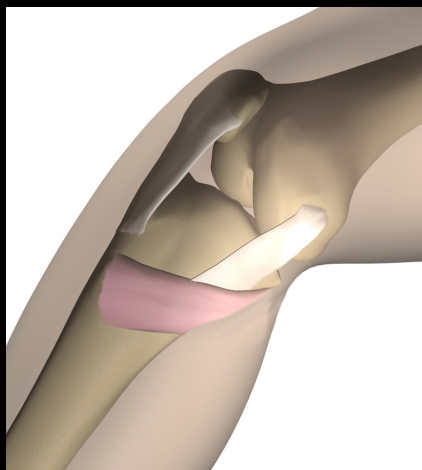
A Systematic Review of the Clinical Evidence

Thomas Tischer,^{*†‡} MD, Jochen Paul,^{†§} MD, Dietrich Pape,^{†||} MD, Michael T. Hirschmann,^{†¶} MD, Andreas B. Imhoff,^{†#} MD, Stefan Hinterwimmer,^{†**} MD, and Matthias J. Feucht,^{†††} MD

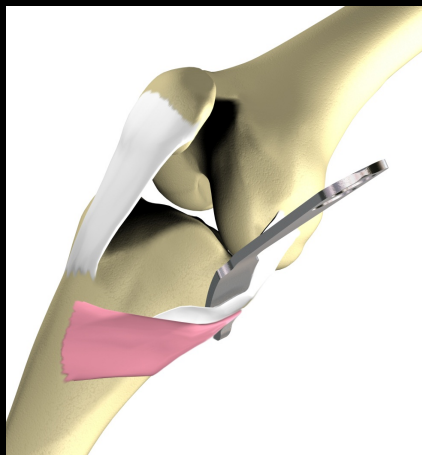
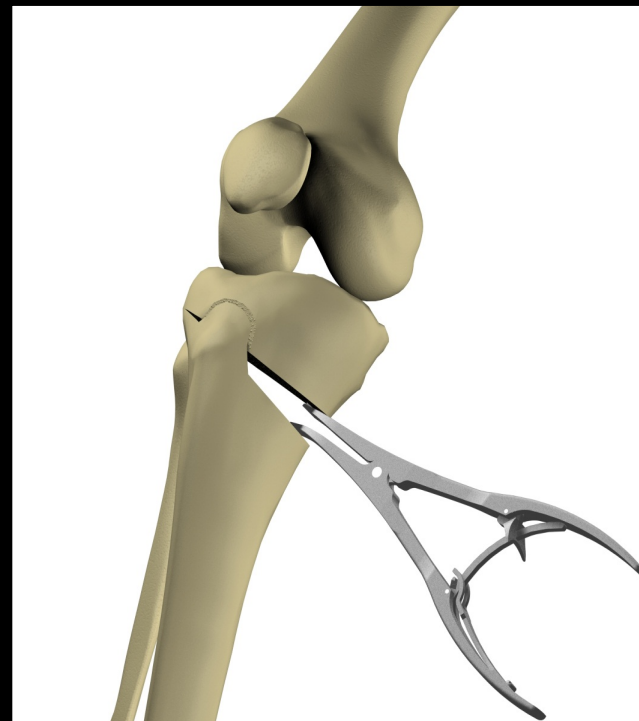
Outline

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- **Osteotomies for chronic lig. instability**
- Timing / staging
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Osteotomy for MCL

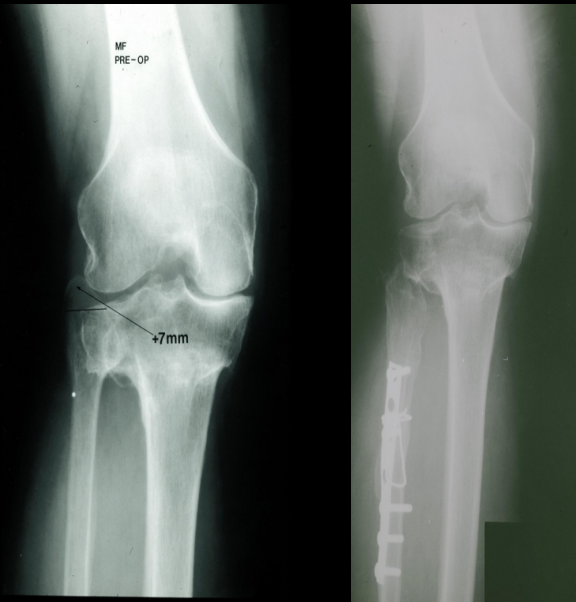


OWHTO = release
MCL

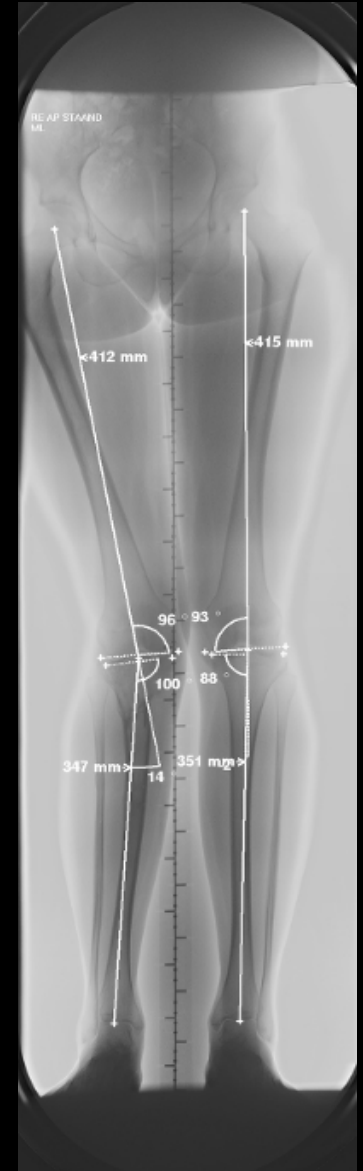


OWHTO without rel. MCL = retention MCL

Osteotomy for LCL



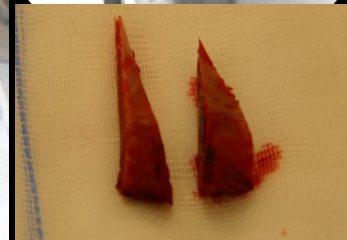
Fibula shortening
= LCL tensioning



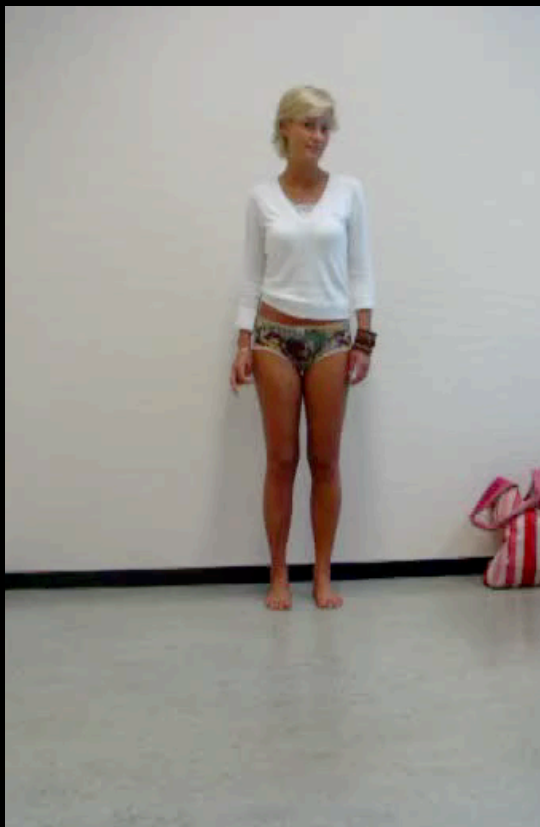
Osteotomy for LCL



LCL "laxity"

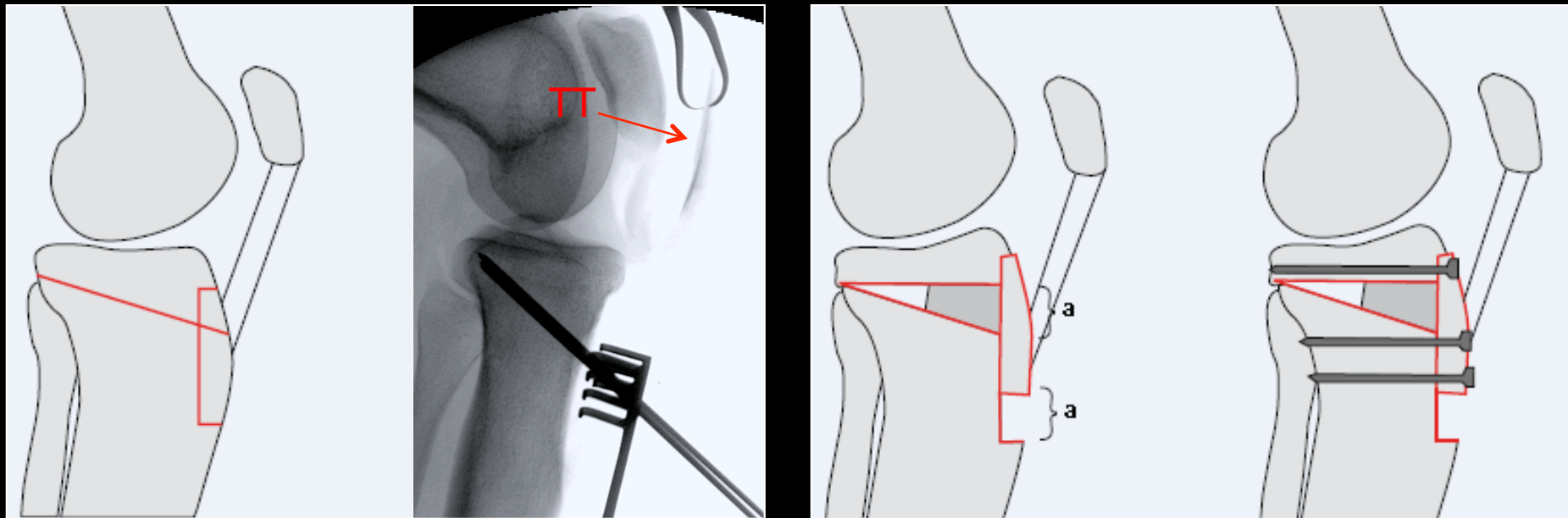


Osteotomy for LCL



Re-alignment creates stability

Osteotomy for PCL – increase slope



“Biological plating”

Friedmann S. Arthroscopie 2008; 21: 30-38.
Bonin N. Orthopäde 2004; 33:193-200.

Balestro JC. Tech Knee Surg 2009;8: 126-135.
Neyret et al. Oper Tech Sports Med 2000; 8: 67-70.

Osteotomy for ACL-decrease slope



Osteotomy for PLC

Open wedge high tibial osteotomy

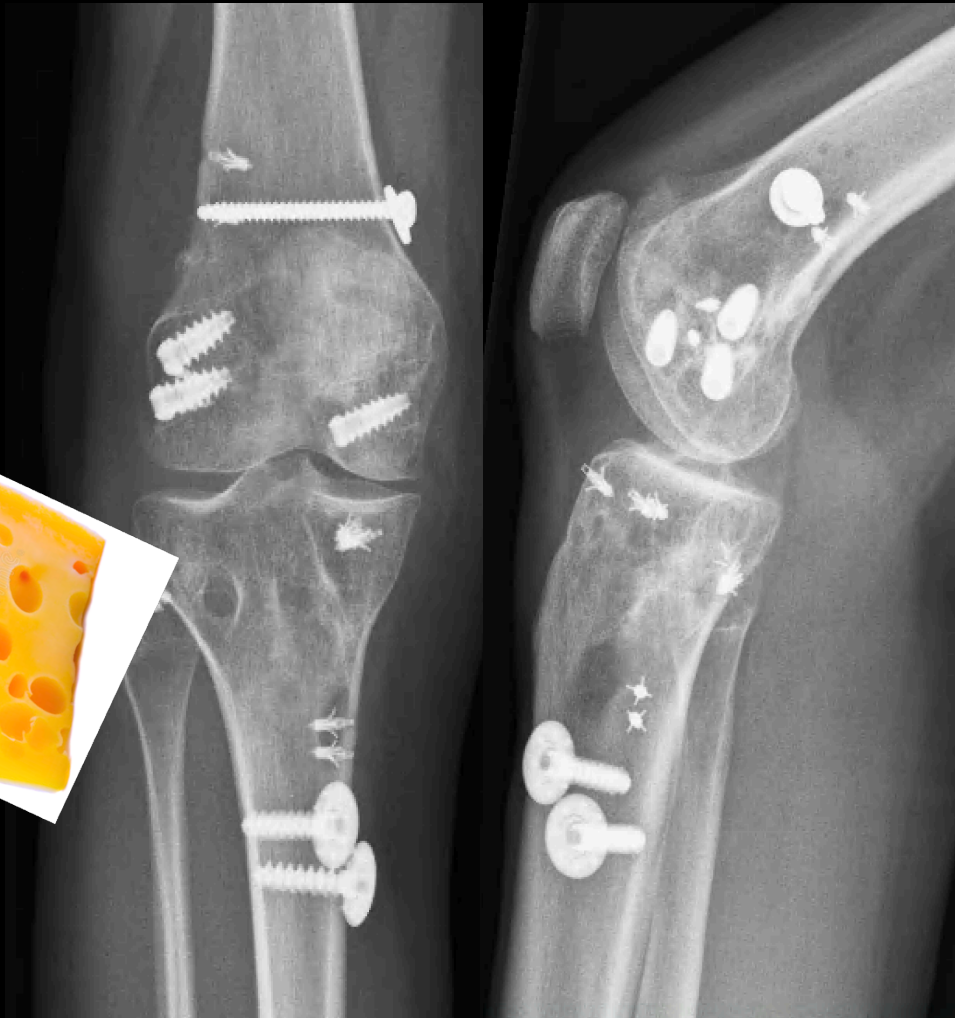
Arthur et al, 2007⁴
To assess the functional outcomes of patients with grade 3 posterolateral instability and varus malalignment treated with open-wedge HTO

- Prospective observation of 21 patients with chronic PLC deficiency and varus malalignment initially treated with open-wedge HTO
- Isolated PLC deficiency was present in 7 patients, 6 patients had ACL and PLC deficiency, 6 patients had PLC and PCL deficiency, and 2 patients had PLC, PCL, and ACL deficiency

37 mo

- In 38% of patients, second-stage ligamentous reconstruction was not necessary
- Isolated PLC injuries required second-stage ligamentous reconstruction in 33% of cases compared with 71% of multiligament knee injury cases
- Low-velocity sports-related injuries required second-stage ligamentous reconstruction in 40% of cases compared with 78% of high-velocity motor vehicle injury cases

Timing / staging of osteotomy



15 previous surgeries
multiligament injury

MCL, PCL, PLC, med meniscus#
-MCL repair, reconstr
-PCL, PCL revision
-PLC, PLC revisions (2 times)
Etc...

Osteotomy

Timing / staging of osteotomy

Osteotomy first or combined with ligament reconstruction

Reichwein and Nebelung, 2007 ⁴⁸	To assess the functional outcome of flexion HTO in patients with symptomatic hyperextension after failed PCL reconstruction	<ul style="list-style-type: none"> • Prospective evaluation of 7 patients with failed PCL reconstruction and symptomatic hyperextension treated with anterior open-wedge flexion HTO (combined with varization in 4 patients) • The mean PTS was altered from 4° preoperatively to 11.4° postoperatively, with a mean increase of 6.6° 	20 mo	<ul style="list-style-type: none"> • Subjective and objective IKDC scores were improved postoperatively in all patients • Second-stage revision PCL reconstruction was performed on 3 patients but only marginally improved the results
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Conclusions

- Key role of osteotomies in chronic (multi-)ligament injuries
- Effect of bone shape (change) is high
- Stage osteotomy first or combined
- Pay attention to bone deformities in revision ligament rec REHAB