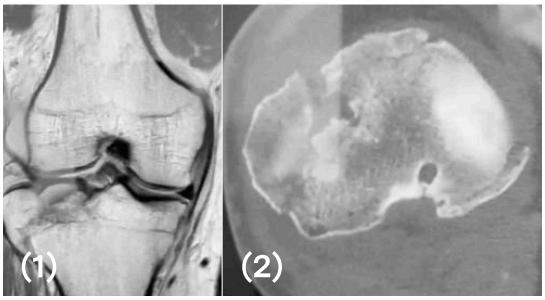
Quantify Soft Tissue: Avoided Prophylactic Fasciotomy

Preliminary data – shared prior to publication with allowance by Prof. Dr. med. R. Sellei, Germany

INTRODUCTION

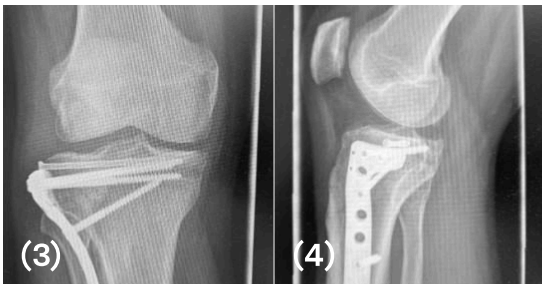
Trauma Case Presentation
- 50-year-old male
- Dislocated, closed fracture of tibial head after high-energy trauma (Ski accident)

→ Pictures 1 + 2



Fracture Treatment
- 5 days after soft tissue consolidation
- Open reduction and internal fixation (ORIF) with bone graft and locking plate
- Direct lateral approach with supportive arthroscopy
- No use of a tourniquet

→ Pictures 3 + 4



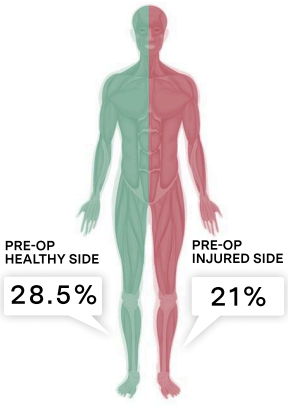
Postoperative Findings
- Increasing pain levels in the affected knee
- Pain out of proportion
- Pain on passive stretch
- Post Operative swelling

→ Picture 5

COMPRESSIBILITY MEASUREMENTS

To support decision-making, non-invasive soft-tissue compressibility measurements (CP-Value [%]) were performed using Compremium Quantis® ST on both the injured and the healthy lower leg.

Pre-operative:
- 0 h : 21% (contralateral side 28%)



Post-operative:

- +2h = 16% | +6h = 8% | +10h = 9% | +14h = 12% | +20h = 16% | 24h = 19%

→ Measurement Timeline

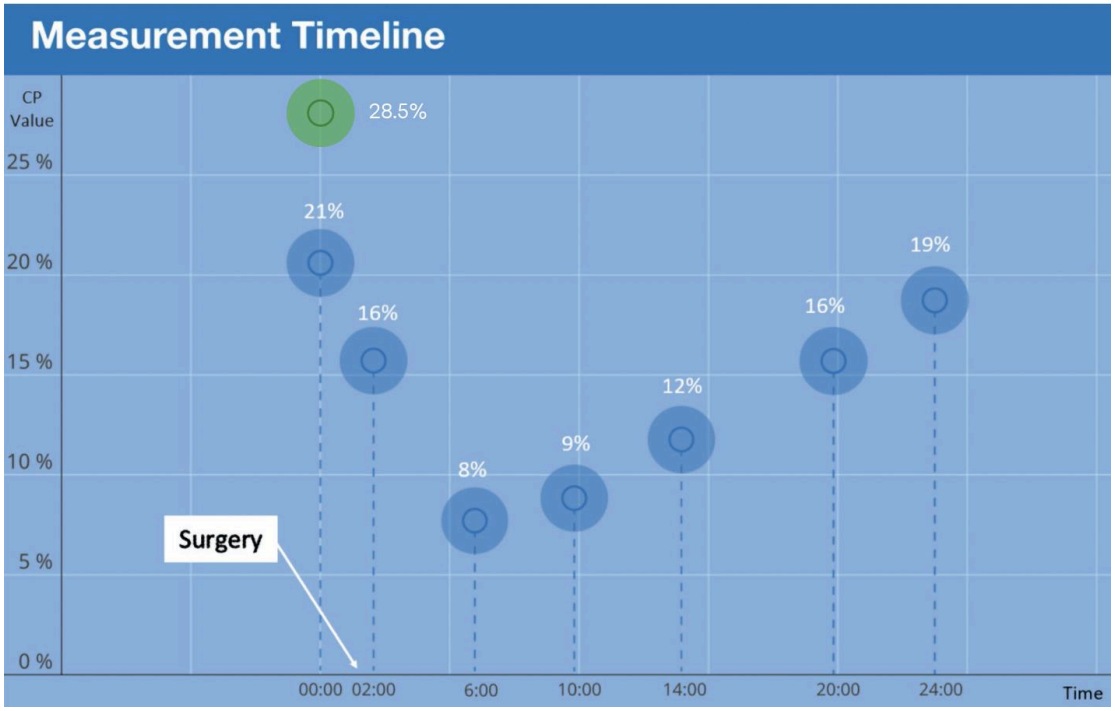


Figure 1. Measurement Timeline Showing pre- and post-operative measurements of injured limb with control measurement of healthy limb.

OUTCOME & CONCLUSION

- **Objective Assessment:** Progressive return to pre-operative baseline compressibility values after surgery suggested soft-tissue recovery.
- **Clinical Decision:** No fasciotomy was performed.
- Contralateral (control) side remained stable at 28 %. The patient achieved full functional recovery.

REFERENCES

1. Sellei RM, Wollnitz J, Reinhardt N, de la Fuente M, Radermacher K, Weber C, Kobbe P, Hildebrand F. Non-invasive measurement of muscle compartment elasticity in lower limbs to determine acute compartment syndrome: Clinical results with pressure related ultrasound. Injury. 2020 Feb;51(2):301-306. doi: 10.1016/j.injury.2019.11.027. Epub 2019 Nov 21. PMID: 31784057.
2. Marmor M, Charlu J, Knox R, Curtis W, Hoogervorst P, Herfat S. Use of standard musculoskeletal ultrasound to determine the need for fasciotomy in an elevated muscle compartment pressure cadaver leg model. Injury. 2019 Mar;50(3):627-632. doi: 10.1016/j.injury.2019.01.015. Epub 2019 Jan 14. PMID: 30745127.

CE-approved intended use

The CPMX1 Software is intended for real-time and intermittent measurement and monitoring of relative compartment compressibility.

FDA-cleared intended use

The Compartmental Compressibility Monitoring System (CPM#1) is intended for real-time and intermittent monitoring of relative compartment compressibility. The relative compartment compressibility (CP Value) is not meant for trend analysis.
510(k) Number: K223509.