Identified Acute Compartment Syndrome: Quantifying soft-tissue assessment for more confident clinical decision-making

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

INTRODUCTION

A 28-year-old male patient presented with soft-tissue swelling and hematoma after a direct impact to the lower leg during a soccer game.
These clinical signs raised concern for Acute Compartment Syndrome (ACS) and required rapid clarification.
To support decision-making, non-invasive soft-tissue compressibility measurements were performed using Compremium Quantis® ST on both the injured and the healthy lower leg.

COMPRESSIBILITY MEASUREMENTS

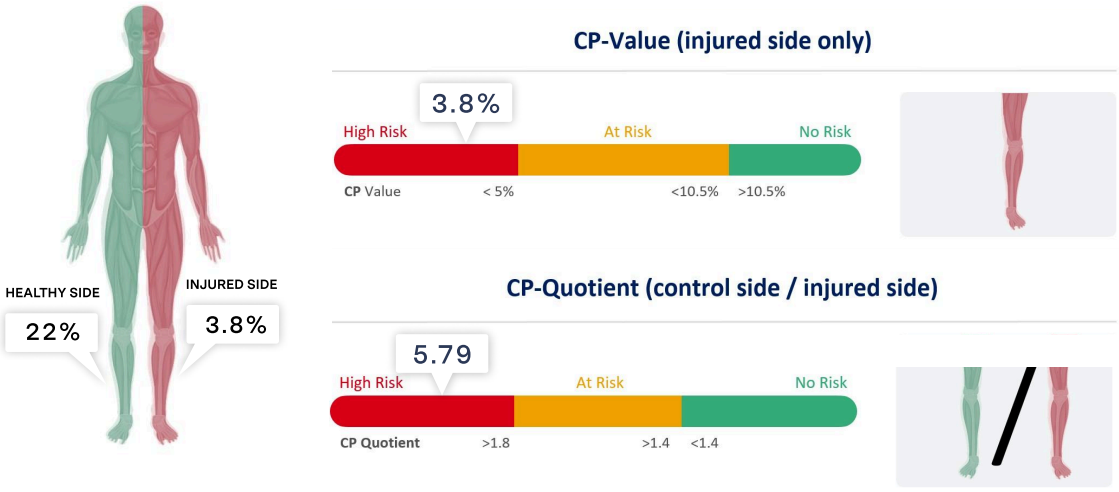

Figure. 2. CP-Value & CP-Quotient as Quantitative Indicators of Soft Tissue Compressibility and Risk Stratification.

CP-Value provides a real-time measurement of tissue compressibility, while CP-Quotient compares readings from the injured and uninjured limbs to establish a personalized baseline. These measurements can be tracked over time to support more informed clinical decisions. The above illustration is for information purposes only.

A Patient CP-Value of 3.8% on the injured side suggests that the patient is in the high-risk zone (Red Zone) for ACS, providing quantitative insight on the critical compartment pressure elevation. The calculated CP-Quotient of 5.79 confirmed the high risk for ACS.

OUTCOME & CONCLUSION

- **Objective Measurement:** The 3.8% soft tissue compressibility value and the CP-Quotient of 5.79 were correlated with concerning clinical findings.
- **Clinical Decision:** The team classified the patient as high risk for ACS and proceeded with immediate fasciotomy.
- **Management:** Compremium Quantis® ST provided clear, objective evidence to support timely surgical decompression definitive fixation.

The critically reduced CP-Value in the injured leg and the CP-Quotient allowed for personalized, quantitative support in ACS risk stratification. As a non-invasive and repeatable method, Quantis ST improves clinical confidence by delivering objective, patient-specific soft-tissue data to inform critical decision-making.

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.
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