Abstract Number: 10962

JOURNAL OF THE JFA Foot & Ankle

A novel arthroscopic classification of deltoid ligament injuries in ankle fractures and its impact on surgical management

Roberto Zambelli de Almeida Pinto[1], Hugo Bertani Dressler[1], Miquel Dalmau Pastor[2], Daniel Soares Baumfeld[3], Rodrigo Simões Castilho[1], João Murilo Brandão Magalhães[1]

1. Rede Mater Dei de Saúde, Belo Horizonte, MG, Brazil
2. Barcelona University, Barcelona, Spain
3. Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil

Correspondence: Hugo Bertani Dressler **Email:** hugobertani@hotmail.com

Introduction: Ankle fractures have an annual incidence of 0.1%-0.2% and may be associated with deltoid ligament injury in up to 58% of cases. The true prevalence and severity of these lesions may be underestimated when assessed using indirect diagnostic methods. Arthroscopy allows direct visualization of the intra-articular fascicles of the deltoid ligament, improving diagnostic accuracy. This study aimed to propose a novel arthroscopic classification of deltoid ligament injuries in acute ankle fractures and to analyze their association with Lauge-Hansen mechanisms.

Methods: A prospective observational study was conducted at a tertiary hospital between January 2022 and March 2025. A total of 229 adult patients undergoing open reduction and internal fixation with arthroscopic assistance were included. Fractures were classified according to the Lauge-Hansen system (SAD, SRE, PAB, PRE). Deltoid injuries were graded arthroscopically as: Type 0 (intact); Type 1 (tibionavicular injury with partial pre- collicular tibiotalar lesion); Type 2 (tibionavicular plus pre- and collicular tibiotalar injury); and Type 3 (complete rupture involving the entire tibiotalar fascicle).

Results: Mean age was 43.7 ± 15 years; 54.1% were male. Arthroscopic deltoid injury was identified in 42.8% (98/229). Among lesions, 31.6% were Type 1, 39.8% Type 2, and 28.6% Type 3. PRE fractures showed the highest injury rate (53.7%), followed by SRE (42.8%), PAB (28.6%), and SAD (12.5%). Increasing fracture-mechanism severity was significantly associated with a higher deltoid injury grade (coefficient = 0.395; 95% CI, 0.082-0.708; p = 0.013).

Conclusion: Deltoid ligament injuries are common and more severe in complex rotational fracture mechanisms when assessed arthroscopically. The proposed novel arthroscopic classification provides an anatomy-based, progressive framework for medial instability and may support more precise intraoperative decision-making in the management of acute ankle fractures.

Keywords: Arthroplasty, replacement, ankle; Ankle fractures; Ligaments, articular.

DOI: https://doi.org/10.30795/jfootankle.2026.v20.2052

This abstract was presented at the XXII Brazilian F&A Meeting 2026, held in São Paulo, Brazil, from April 18 to 21, 2026.