

Arthroscopic Evaluation of Associated Soft Tissue Injuries in Distal Radius Fractures



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KEYWORDS

• Arthroscopy • Chondral • DRU joint • Lunotriquetral ligament • Scapholunate ligament • TFCC

KEY POINTS

- A fall onto an outstretched hand may cause a wide spectrum of injuries, such as a simple sprain, radial styloid fracture in isolation, or a radial styloid fracture as part of a greater arch injury, thereby forming part of a complete or incomplete perilunate dislocation mechanism.
- Displaced radius fractures in nonosteoporotic patients have a high incidence of associated soft tissue injuries. Associated injuries affect the long-term outcome, and arthroscopic evaluation is paramount to establish a correct and complete diagnosis and facilitate early treatment.
- After falls, arthroscopy can diagnose triangular fibrocartilage complex injuries, inter-carpal scapholunate and lunotriquetral ligament tears and chondral lesions. Once evaluated and graded, the appropriate surgical treatment of these lesions can be added to the fracture fixation.
- Undetected associated injuries may explain the absence of improved outcome in studies comparing volar locking plate fixation and early mobilization versus external fixation. Possibly, further improved outcome may follow if arthroscopy is used in conjunction with volar locking plate fixation.
- Arthroscopy as an adjunct in the management of distal radius fractures has been available for more than 20 years, but still requires experience and management in expert centers. Successful management of this simple but complex fracture requires:
 - Thorough understanding of the anatomy.
 - Understanding the relevance of individual fracture fragments.
 - Awareness of associated soft tissue injuries.

INTRODUCTION

The outcome of distal radius fracture treatment can still not be fully predicted. There is no scientific evidence for anything that is done in the management of distal radius fractures.¹

Arthroscopic evaluation is superior in assessing the intra-articular step-off as well as the rotation of articular fracture fragments. It is also possible to identify and evaluate chondral and

ligament injuries (**Table 1**).^{2–4} There is a high incidence of soft tissue injuries associated with distal radius fractures, which are frequently missed when the fracture is managed by conventional methods of treatment (see **Table 1**).^{2,3} These injuries are to be expected because the radius is involved in the greater arch mechanism described by Mayfield and colleagues⁵ in perilunate dislocations (**Fig. 1**). This

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Table 1
Soft tissue injuries associated with distal radius fractures

Study, Year	Number and Type of Injury	TFCC Injury (%)	SL Injury (%)	LT Injury (%)
Geissler et al, ² 1996	60, intra-articular	49	32	15
Lindau et al, ³ 1997	50, intra-articular and extraarticular	78	54	16
Richards, ¹⁷ 1997	118, intra-articular and extraarticular	35 (intra-articular) 53 (extraarticular)	21 (intra-articular) 7 (extraarticular)	7 (intra-articular) 13 (extraarticular)
Mehta, ¹⁸ 2000	3, intra-articular	58	85	61
Hanker, ¹⁹ 2001	173, intra-articular	61	8	12

Abbreviations: LT, lunotriquetral; SL, scapholunate; TFCC, triangular fibrocartilage complex.

condition is particularly noted in nonosteoporotic patients who more often present with intra-articular fractures caused by a severe, high-energy trauma, whereas such associated injuries are uncommon in osteoporotic patients, in whom most fractures are extraarticular and caused by low-energy trauma. Hence, arthroscopy should be considered in younger patients with high-energy trauma, in particular radial styloid fractures, in order to detect these injuries in addition to improving intra-articular congruency by arthroscopically fine-tuned reduction and fixation of these fragments (see Fig. 1).

INDICATIONS FOR ARTHROSCOPY IN DISTAL RADIUS FRACTURES

- The main indication for arthroscopy in the management of distal radius fractures is an

intra-articular step-off of more than 1 mm after an attempted closed reduction.

- Second, radius fractures with associated scaphoid fractures and/or obvious ligament injuries benefit from arthroscopic evaluation. Radiological signs may suggest associated soft tissue injuries, such as widening of intercarpal joint spaces and/or radiographic disruption of the carpal arches of the Gilula lines; the 3 arches that can be drawn along the proximal and distal carpal rows (see Fig. 1).
- Third, a radiological widening of the distal radioulnar (DRU) joint may be another sign of a ligament injury to the triangular fibrocartilage complex (TFCC) that may need arthroscopic evaluation.
- Simple radial styloid fractures are most often 2-part fractures and may be part of an incomplete greater arch injury according to the

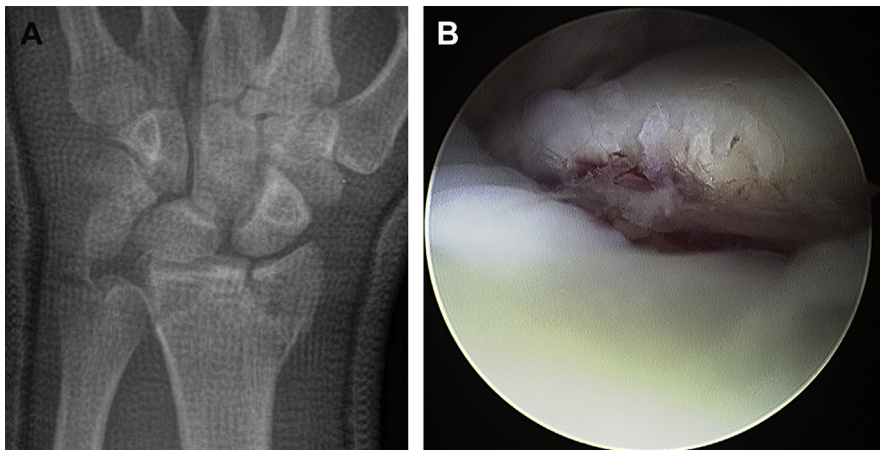


Fig. 1. (A) Radius fracture with associated scapholunate (SL) ligament injury diagnosed with the ring sign of the scaphoid. (B) Arthroscopic view of the fracture affecting the ridge between the lunate (left in image) and scaphoid facets of the radius.

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