

# Arthroscopic Treatment of Symptomatic Congenital Lunotriquetral Coalition

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J Wrist Surg 2018;7:341–343.

## Abstract

### Keywords

- ▶ lunotriquetral
- ▶ coalition
- ▶ arthroscopy
- ▶ surgery
- ▶ wrist

Symptomatic lunotriquetral coalition is very rare and need open surgery after failure of conservative treatment. We report a case of a symptomatic congenital lunotriquetral coalition type 1 according to the Minaar classification, at the left wrist of a 14-year-old boy. We performed an arthroscopic treatment with two compression screws and without cancellous bone grafting. Healing was obtained at 2 months postoperatively.

Lunotriquetral (LT) fusions are the most common carpal coalition.<sup>1</sup> An uncommon subtype of congenital LT coalition in which there is incomplete fusion—or synchondrosis—is the most likely to become symptomatic.<sup>2,3</sup>

Here we demonstrate that an arthroscopic treatment without any injury of the dorsal capsule could be an effective treatment to obtain LT union without stiffness of the wrist.

## Case Report

We present the case of a painful LT synchondrosis type 1 according to the Minaar classification.<sup>2</sup> A 14-year-old boy presented with left wrist pain of 12 months duration. He experienced worsening pain (7/10) which would occasionally radiate to the fourth and fifth digits, and would sometimes affect the entire hand. He reported intermittent tingling and numbness in his hand, aggravated by playing basketball. He presented also with recurrent clicking sensations in the wrist and a chronic sense of stiffness. No previous trauma was reported. Physical examination revealed mild fullness along ulnar dorsal wrist, tenderness on dorsal wrist at the level of the proximal carpal row, and dorsal triangular fibrocartilage complex without carpal or distal radioulnar joint instability. The ultrasound examination did not show any cyst, tendon instability, or tenosynovitis but just a slight radiocarpal synovitis Doppler negative.

Wrist extension measured 70° and 60° of flexion. Ulnar deviation measured 5° and radial deviation 5°. Grip strength was 25 kg (and the other side was 35 kg). He had no clinical findings of peripheral nerve entrapment. Radiographs revealed narrowing of the LT joint space at its superior part (▶Fig. 1). The articular surfaces were found irregularly margined. Magnetic resonance imaging showed a fibrocartilage connection of the proximal LT joint with adjacent bone marrow edema (▶Fig. 2). The other hand presented a synchondrosis type 2 with no pain (▶Fig. 3). The patient received a course of conservative treatment for 6 months including wrist brace immobilization, activity modification, nonsteroidal anti-inflammatory medication, and occupational therapy. No steroid injection to the LT joint was given. He experienced no improvement in symptoms. His pain was debilitating. He was advised to have surgery, and LT fusion was performed under dry arthroscopy with four portals 3 to 4, 6R, midcarpal ulnar (MCU), and midcarpal radial (MCR). The first exploration was midcarpal thanks to the MCR scope and a burr instrumentation through the MCU portal. At the radiocarpal view, an intact cartilaginous bridge was found across the lunate and triquetrum, whereas two distinctly separate surfaces were noted distally at the mediocarpal view. The cartilage resection had been performed proximally and distally. The control of the resection was made regularly by changing the scope and the instrumental approaches.

received

June 5, 2017

accepted

January 8, 2018

published online

February 14, 2018

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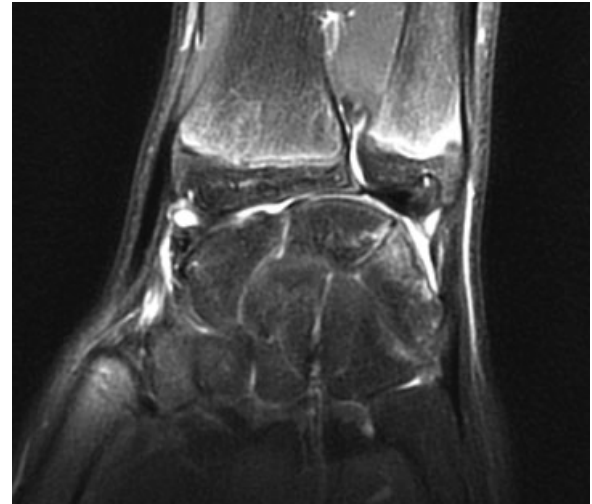
DOI <https://doi.org/>

10.1055/s-0038-1627444.

ISSN 2163-3916.



**Fig. 1** Preoperative radiograph of the lunotriquetral coalition at the left wrist.



**Fig. 2** Magnetic resonance imaging showing the bone edema at the lunotriquetral (LT) coalition. No pathology of the LT ligament.

Osteosynthesis was performed under C Arm fluoroscopy with two percutaneous hand motion (NewClip Technics, France) compression screws (2.25 diameter and 26 mm length) without bone grafting. A splint was placed for only 3 weeks (the double-screw stabilization was very solid), and then a physiotherapy was advised for passive motion.

At 3 months follow-up, the postoperative range of motion included 75° of extension, 80° of flexion, and the ulnar and radial deviation measured 5° and 5°, respectively. Subsequent radiographs showed complete fusion at 2 months postoperatively with a complete relief of pain (→ **Figs. 4** and **5**). At 3 months, grip strength was 35 kg and he was authorized to practice basketball. At the last follow-up of 1 year, the postoperative range of motion included 85°

of extension, 80° of flexion, and the ulnar and radial deviation measured 5° and 5°, respectively ; grip strength was 40 kg (and the other side was still 35 kg).

**Discussion**

Although the exact reason why a type I LT coalition becomes symptomatic is not clear, there are several theories: lack of sufficient cartilage present in the incomplete fusion area can cause pain and can be exacerbated by trauma.<sup>4</sup> Over time, this inadequate cartilage can lead to painful degenerative arthritis. Others assert that the fibrocartilage coalition poorly tolerates stress loading or trauma compared with an efficient interosseous LT ligament.<sup>5</sup>



**Fig. 3** Complete asymptomatic lunotriquetral fusion at the upper part of the joint at the right wrist.



**Fig. 4** Anteromed-posterior view of complete fusion of the upper part of the lunotriquetral joint at 6 months follow-up.



**Fig. 5** Lateral view of complete fusion of the upper part of the lunotriquetral joint at 6 months follow-up.

All the authors reported surgical LT fusions procedures with a dorsal approach with<sup>5,6</sup> or without cancellous bone grafting.<sup>4,7,8</sup>

Only one failed and was performed with iliac bone graft and K-wire fixation.<sup>5</sup> In LT coalition, every patient who underwent successful LT arthrodesis had pain relief with complete resolution of symptoms in most cases. The range of motion is generally improved thanks to pain relief. A higher rate of nonunions is reported in the literature in LT fusion for LT instability.

The cannulated screws can as compression screws obtain an effective and solid stabilization between the two bones;

the arthroscopic approach avoids the capsular devascularization of the dorsal radiocarpal ligament and dorsal ulno-triquetral ligament. Obviously, dry arthroscopy permits bone grafting through a cannular device as the four-corner arthrodesis,<sup>9</sup> but we did not use it for that case.

#### Conflict of Interest

None.

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