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## Entrapment of the ulnar nerve in cubital tunnel by free intra-articular body—a case report

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### Introduction

Ulnar nerve is often trapped in cubital tunnel at elbow level, this being the second most common place of entrapment of the peripheral nerves in the upper limb.<sup>3</sup> The most commonly associated etiology is the anatomic alteration of the cubital tunnel.<sup>12</sup> There are three mechanisms described: compression, traction, and friction. The symptoms exhibited are hypoesthesia, pain, and weakness, which increase with the bending of the elbow at an angle greater than 90°, and according to nerve involvement we can classify the clinical status using the modified McGowan score.<sup>13</sup> In this article, an unusual extrinsic compression mechanism to cubital tunnel is shown, caused by free intra-articular body, and its surgical management.

### Case presentation

A 32-year-old man presented with a history of fracture-dislocation of the left elbow of 2 years' evolution that needed prosthetic management for the broken radial head. Subsequently, he presented with progressive hypesthesia in the territory of the ulnar nerve on bending of the elbow at an angle >90°. The result of the bending of the elbow test with sustained extension of the wrist was positive, causing increased hypesthesia in the territory of the ulnar nerve. No atrophy or motor loss was evidenced, so the patient was classified as stage I according to the modified McGowan score.<sup>13</sup>

The elbow joint range of motion was 10°–120°, associated with the level of pain, and pronation-supination was limited to 10°. Entrapment of the ulnar nerve at the elbow was confirmed by electromyography. On radiologic examination, it was noted that the radial head arthroplasty was in good position, without signs of loosening (Fig. 1, A), with osteoarthritis changes and a free intra-articular body (Fig. 1, B).

Surgery of the elbow was performed through a medial approach, focused on the medial epicondyle, with exploration of the cubital tunnel, where signs of thickened ulnar nerve were found (Fig. 2, A). Articular capsule distention was also found at the same level (Fig. 2, B), and a free body was observed by making an incision (Fig. 3). Subsequently, capsular release and anterior submuscular transposition of the nerve and reinsertion of the medial epicondylar muscles were performed (Fig. 4). After surgery, management was 2 weeks of immobilization, with the splint at 90°, and a rehabilitation program. The patient evolved well; he was evaluated 3 months after surgery, and we found an elbow joint range of motion within the normal range (Fig. 5 and Video S1). The result of the bending of the elbow test with sustained extension of the wrist was negative. The clinical status of the patient was normal according to the modified McGowan score.

### Discussion

The ulnar nerve is trapped in 5 anatomic sites: arcade of Struthers, cubital tunnel, medial epicondyle, flexor deep fascia, and Guyon canal.<sup>3,12</sup>; the cubital tunnel, at elbow level, is the second most common place of entrapment of the ulnar nerve. This entrapment is caused by primary and secondary anatomic changes affecting the size of the cubital tunnel, as O'Driscoll et al described.<sup>12</sup> The ulnar nerve in the elbow is involved by entrapment in the cubital tunnel associated with friction caused by instability of the nerve in patients with medial epicondylitis, traction in cubitus valgus, and osteoarthritis.<sup>5,6,8</sup>

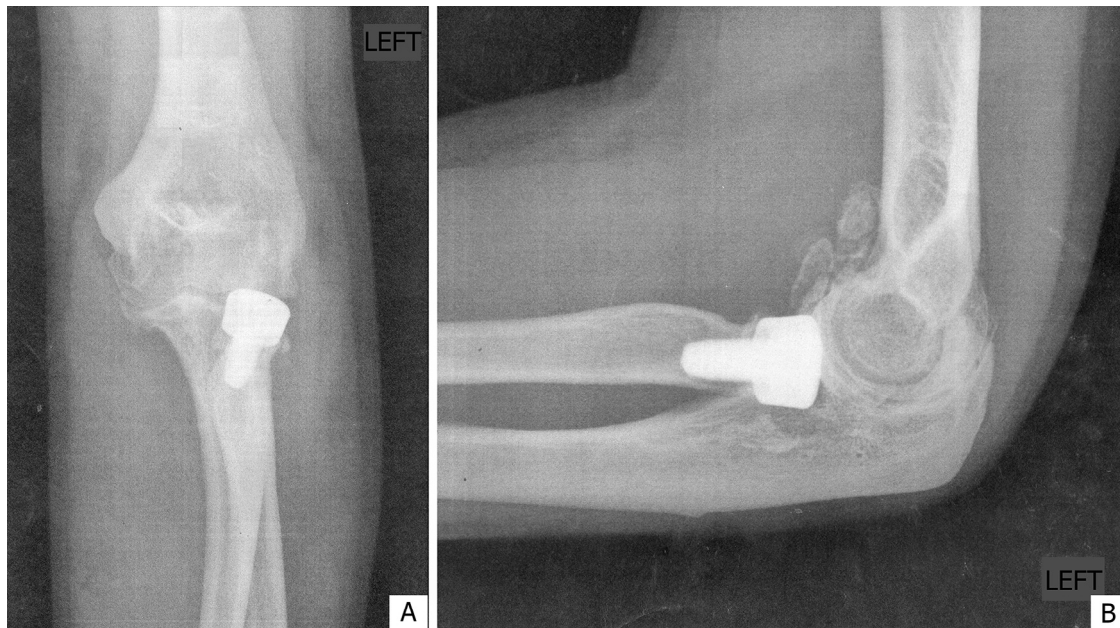
This case report was approved for publication by the Ethics Committee of the Faculty of Health, Universidad Industrial de Santander: No. 6-1.38/2.

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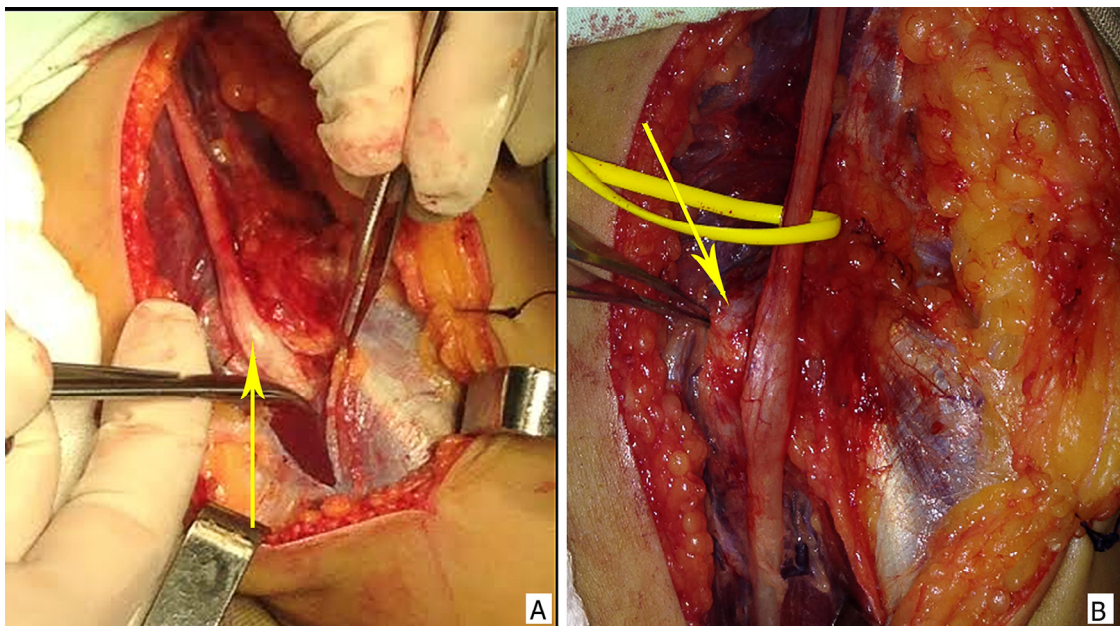


**Figure 1** Plain film radiography of the left elbow. (A) Anteroposterior view showed radial head arthroplasty in good position. (B) Side view showed free intra-articular bodies.

The entrapment of the ulnar nerve, by an external cause, at the cubital tunnel level is due to inflammatory or degenerative processes. Cases like this, in which a free intra-articular body distended the elbow joint capsule, causing compression of the nerve by cubital tunnel narrowing, are uncommon. The origin of the free intra-articular body could be secondary to a type of chondromatosis inflammatory process, as described by Kim et al and Mueller et al,<sup>7,11</sup> or an osteoarthritis, like the present case, with a clear connection between the fracture of the radial head and the subsequent outbreak of free intra-articular bodies. Within the etiologic diagnosis, it was considered that the entrapment of

the ulnar nerve was caused by bone spicules secondary to osteoarthritis, but it was discarded with radiologic and surgical findings of free intra-articular bodies.

The diagnosis of ulnar nerve entrapment is made by clinical findings and electromyography. Imaging studies also contribute to the diagnosis and the definition of the characteristics of the entrapment of the ulnar nerve. Ultrasound (US) evaluation checks thickening of the nerve, which is characterized by loss of fascicular pattern, increased hypoechoogenicity because of perineural edema, and increased cross-sectional diameter of the nerve, with a normal reference<sup>2,4</sup> value up to 10 mm<sup>2</sup>. Taking these into account, increased



**Figure 2** Surgical exploration of the cubital tunnel. (A) Thickening of the ulnar nerve at that level (arrow). (B) Ulnar nerve compression in the cubital tunnel, resulting from articular capsule distention (arrow).

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