SCIENTIFIC ARTICLE

Supracondylar Process Syndrome: Case Report and Literature Review

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The supracondylar process is a congenital bone projection on the distal anteromedial humerus often associated with a ligament of Struthers, a fibrous connection between the process and medial epicondyle. It is largely asymptomatic and only on rare occasions presents with neurovascular compression resulting in a supracondylar process syndrome. This case report describes a 28-year-old woman with supracondylar process syndrome, and our management. The topic is further explored with a literature review of 43 reported cases. Analysis of the case reports indicates that isolated median nerve injuries are the most common. Other presentations such as fractures, vascular compromise, and ulnar nerve involvement are less frequent. *(J Hand Surg Am. 2014;39(6):1130–1135. Copyright © 2014 by the American Society for Surgery of the Hand. All rights reserved.)*

Key words Humerus, median nerve, Struthers, supracondylar process.

STRUTHERS DESCRIBED THE supracondylar process and associated ligament in 1848.[1] The supracondylar process is a beak-shaped bone spur arising from the distal anteromedial portion of the humerus. This congenital variation is present in 0.1% to 2.7% of people,[2] most of whom never experience symptoms. The process is most commonly found 4 to 8 cm proximal to the medial epicondyle.[2] It projects distally and varies in size from 2 to 20 mm.[2] The ligament of Struthers is a fibrous band extending from the tip of the process to the medial epicondyle. Neurovascular structures, most commonly the median nerve and brachial artery, pass under the ligament. This can become a site of entrapment, resulting in supracondylar process syndrome. The process can be found without an associated ligament, and likewise the ligament can be present without a process, attaching directly to the humeral shaft.[3–5] Variations in anatomy can place the median nerve superficial or deep to the ligament of Struthers, where symptoms can develop.[6]

The pronator teres often originates from the process and ligament.[3,6–13] In addition, the coracobrachialis may attach to the supracondylar process.[7,14] The process is easily visible on oblique radiographs and is occasionally missed on anteroposterior and lateral images. Some case reports describe magnetic resonance imaging and ultrasound as useful imaging modalities.[1,2]

CASE REPORT

A 28-year-old, right-handed woman presented with medial left elbow pain of gradual onset with mild paresthesia in the median nerve distribution and vague pain in the proximal forearm. The symptoms worsened with activity and local pressure. The patient was taking oxycodone for arm pain. Her medical history was noteworthy for hypothyroidism. On examination, there was tenderness and a positive Tinel's sign above the medial epicondyle. Other provocative tests were negative. The ulnar nerve function was normal with no weakness or hypesthesia. The flexor pollicis longus and flexor digitorum profundus had normal strength. The x-ray taken at the initial consultation showed a supracondylar process that was not palpable (Fig. 1). Differential diagnosis included medial epicondylitis (nontender, and no pain with pronation or resisted wrist flexion) and cervical radiculopathy (normal

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FIGURE 1: Radiograph showing supracondylar process.

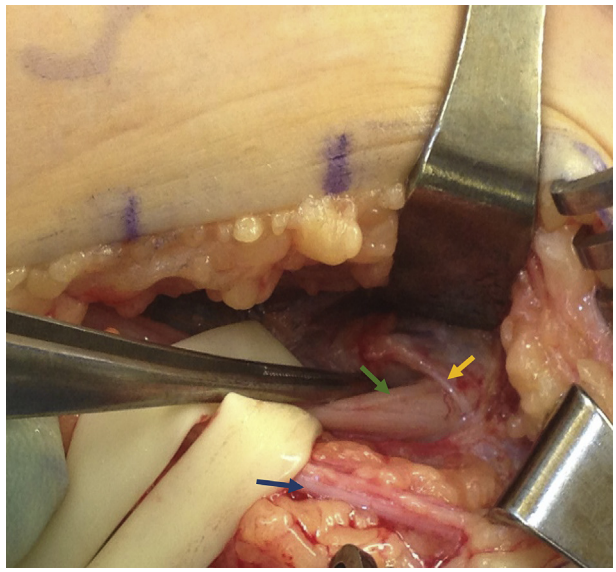

FIGURE 2: Medial approach reveals the supracondylar process with attached ligament of Struthers (yellow arrow). The median nerve (green arrow) passes deep to the ligament. The brachial artery (not pictured) is lateral and superficial to the ligament. The ulnar nerve (blue arrow) is medial and is not affected by the ligament.

cervical spine range of motion and negative Spurling test). Initial conservative management was attempted with extra care to avoid local pressure and excessive activity. Her symptoms gradually worsened over 5 months with pain at rest and increasing paresthesia. She had an episode of intense exacerbation after massage in the area. Surgical management was undertaken with a medial approach and revealed a 15-mm supracondylar process located approximately 6 cm proximal to the medial epicondyle (Fig. 2). The process was connected to a ligament of Struthers with the median nerve running deep to it. The brachial artery was lateral and superficial to the ligament. The median nerve appeared normal, without signs of hourglass compression. The median nerve was decompressed to the proximal edge of the pronator teres. There was no muscle attachment to the ligament or process. The supracondylar process and the ligament were excised. The procedure resulted in complete resolution of symptoms, and 1 year later she remained asymptomatic. The pathology report of the specimen described skeletal muscle with reactive osteometaplasia and no malignancy.

DISCUSSION

The median nerve can become entrapped at several sites proximal to the carpal tunnel. Potential sites of impingement are the bicipital aponeurosis, the 2 heads of the pronator teres, the flexor digitorum superficialis aponeurotic arch, and a Gantzer muscle. The most common proximal neuropathies are pronator syndrome (compression by the 2 heads of the pronator teres) and anterior interosseous nerve syndrome.[15–17] In a study by Gessini et al,[15,18] 0.5% of median nerve entrapments could be attributed to supracondylar process syndrome.

Because of variations in regional anatomy, structures other than the median nerve and brachial artery can be compressed. These include the ulnar nerve, divisions of the musculocutaneous nerve (lateral antebrachial nerve), and branches of the brachial artery (ulnar artery).[8,14,19]

Table 1 summarizes 43 previously described supracondylar process syndrome cases. Most patients presented with median nerve compression symptoms (paresthesia, numbness, and weakness). Pain was often exacerbated by extending and pronating the forearm. Tenderness medially above the elbow and a palpable process were common signs.

Isolated median nerve symptoms were the most common reason for presentation, described in 18 of cases (Fig. 3). All 5 patients with combined symptoms and 3 fractured process cases had median nerve involvement. The median nerve was the most commonly involved structure (26 patients); 24 of these were managed surgically. Two patients were managed