Struthers ligament: a source of median nerve compression above the elbow

Case report

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A case of median nerve entrapment at the elbow by a non-osseous fibrous ligament (Struthers) is presented. A relatively simple surgical procedure with ligament division afforded complete relief of symptoms. The existence of Struthers' ligament without a bony supracondylar process is reaffirmed, and the historical background of its identification outlined.

Key Words • median nerve compression • ligamentous compression (Struthers) • supracondylar process

Although the occurrence of a supracondylar process is relatively rare (0.7% to 2.7%), it is a known anatomical variant.1 Median nerve entrapment from such a process is more rarely reported.1,2 Entrapment of the median nerve above the elbow in the absence of an osseous process has not been reported since the Edinburgh anatomist, John Struthers, in 1881 presented his experience with the supracondylar process and its relation to the nerve.4 The following case illustrates such an entity.

Case Report

A 30-year-old man had a 1-month history of right anticubital fossa and medial arm pain of insidious onset. The pain was associated with weakness of the right grip, wrist pronation, and weakness and tingling in the right index finger. Examination revealed medial elbow and forearm pain during extension of the elbow or pronation of the wrist, and moderate weakness of the pronator teres, flexor carpi radialis, opponens pollicis, flexor pollicis longus, and flexor digitorum sublimis. There was no demonstrable sensory deficit. The radial pulse was normal and Tinel's sign absent. No bony supracondylar mass could be palpated. An electromyogram revealed impairment of the right median nerve conduction at the elbow. X-ray films of the humerus and elbow were normal. Under local anesthesia, the median nerve was explored in the antecubital fossa and adjacent medial upper arm. The nerve and brachial artery were found to be entrapped beneath a tough, fibrous, ligamentous band of tissue running from the anteromedial distal humerus to the superior surface of the medial epicondyle (Fig. 1). Division of this band exposed a swollen portion of median
Compression of median nerve by abnormal ligament

nerve immediately beneath the ligament. At follow-up examination 1 year later the patient was asymptomatic, with normal median nerve conduction velocity and motor function.

Discussion

In 1848, while a medical student, John Struthers, described "a peculiar process . . . developed from the humerus . . . and the ligament by which a protective arch is completed . . . which affords protection to the humeral artery and median nerve." He also inferred that the brachial artery could be compressed by this ligamentous arch.\(^3\) Struthers made reference to reports by Tiedemann in 1822 and Knox in 1841 describing "an exostosis of the humerus" and associated ligament, but did not emphasize any clinical significance. Magendie (circa 1840) was actually the first to describe this anatomical variant as the "supracondyloid" process and foramen.\(^3,4\)

In 1881 Professor Struthers spoke before the International Medical Congress in London essentially summarizing his experience with the "Processus Supracondylodeus Humeri of Man." He estimated that the abnormality was present in one of every 50 patients, but in varying degrees of development, with "the process being very short or even absent, the fibrous arch alone being present." The rudimentary form of this process was felt to occur so often "that it may almost be regarded as a normal condition of the human arm." However, anatomical demonstration of the most rudimentary fibrous band required finger palpation rather than visual inspection.\(^4\) The original reports described a bony prominence arising on the anteromedial surface of the humerus 1\(\frac{1}{2}\) to 2\(\frac{1}{2}\) inches above the medial epicondyle and not exceeding \(\frac{1}{4}\) inch in length; the distal portion of the process was ligamentous and attached to the superior aspect of the medial epicondyle.\(^3\)

The supracondylar process with its ligamentous extension encloses a foramen bounded medially by the medial intermuscular septum and the distal anterior surface of the medial epicondyle. The brachial artery and median nerve usually pass under the ligament. Median nerve entrapment by the bony process and/or ligament can easily be differentiated from the more commonly recognized "pronator syndrome" by the presence of pronator teres weakness.\(^9\)

Our case of median nerve entrapment by a rudimentary fibrous ligament serves to reaffirm John Struthers' original observation that the supracondylar process exists in varying degrees of development and may be present as a non-osseous structure.

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References


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