

## CASE REPORT

# SUPRACONDYLAR PROCESS OF THE HUMERUS

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**Four cases of supracondylar process of the humerus in three patients are presented. The main features of a supracondylar process as compared with an osteochondroma are reviewed.**

**The three patients had pain and one had signs indicating median nerve compression. One had a supracondylar process together with an osteochondroma in the contralateral supracondylar region. One patient with a bilateral supracondylar process refused an operation. The other two patients underwent surgical treatment. The symptoms disappeared in the two patients who were operated.**

**Keywords :** supracondylar process ; humerus.

**Mots-clés :** apophyse supra-condylienne ; humérus.

## INTRODUCTION

The supracondylar process is a beak-like bony projection that arises from the anteromedial surface of the humerus. It is usually clinically silent, but it may sometimes become symptomatic owing to compression of the median or ulnar nerve or brachial artery.

In this report, one patient with a bilateral process, one patient with a unilateral process and one patient with a unilateral process and an osteochondroma on the contralateral side, that is, three patients with four supracondylar processes are presented.

## CASE 1

A 25-year-old male with right-hand dominance working as an independent accountant complained of pain in the left elbow and forearm. He indicated

that the pain decreased but continued when he brought his left arm into flexion and that the pain increased when he brought his arm into extension. He stated that he had had such complaints for 3 to 4 years. On physical examination, he had a fixed mass of 1 cm, painful on pressure and palpable on deep palpation on the medial aspect of his left elbow 6 to 7 cm proximal to the epicondylar region. Motor and sensory functions of the nerves and muscle strength were normal. Tinel and Phalen tests were negative. However, he complained of tension in the forearm and pain around the elbow when the latter was extended and the forearm pronated. Xrays of the left elbow demonstrated a process located 6 cm above the medial humeral epicondyle and extending obliquely downwards (fig. 1). Brachial, radial and ulnar arteries were evaluated, and no pathology was noted. No anomalies were identified on electromyography (EMG). Laboratory tests were within normal limits.

The patient was operated because of excessive pain. The supracondylar process and ligament of Struthers were accessed through a medial approach posterior to the biceps muscle. The ulnar nerve was identified and preserved. It was noted that the median nerve and brachial artery were underneath

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*Fig. 1.* — Anteroposterior view of the supracondylar process in case 1.

the ligament of Struthers ; however, there was no finding suggesting compression. The ligament of Struthers and the process were excised preserving the artery and the nerve. There was no pathology in other soft tissues. The complaints had resolved when he was seen one month postoperatively, and the process had not recurred after one year.

### CASE 2

A 14-year-old male student indicated that he had had pain in his right arm for one year and that the pain had recently become more severe. The pain increased when he used his arm, especially while writing. He complained of weakness of his fingers, especially of his first three when compared with the other hand.

On physical examination, he had a fixed mass of 0.5 - 1 cm, painful on pressure and palpable on deep palpation on the medial aspect of his right elbow 4-5 cm proximal to the medial epicondyle. There was hypoesthesia and decrease in motor function in the region corresponding to the distribution of the median nerve. When the finger flexors were compared with the opposite side, there was loss of strength. The Tinel test was positive in the region where the mass was located and Phalen's test was negative. Pronation of the extended elbow aggravated the pain. On systemic evaluation, the



*Fig. 2.* — Right supracondylar process and left supracondylar osteochondroma in case 2.

patient had a palpable mass, 2-3 cm proximal to the medial epicondyle of the left humerus. Examination of the muscle and nerve and circulation of the extremity was normal.

Xrays of the right elbow demonstrated a spur growing medially and distally from the cortex 4 cm proximal to the right medial epicondyle. EMG showed that the conduction velocity in the median nerve was slow. Xrays of the left elbow showed a spur originating from the cortex medially and 2 cm proximal to the medial epicondyle. It was noted that the cortex of this spur was in continuity with the humeral cortex. It was considered to be an osteochondroma (fig. 2). Follow-up was suggested.

The patient was operated for the spur on his right arm. The spur was explored ; the median nerve and brachial artery were found to lie underneath the ligament of Struthers. This ligament was excised together with the spur, preserving the artery and the nerve. There was no pathology in other soft tissues. The patient's complaints had disappeared when he was seen one and a half months postoperatively. Since he had no complaints from the osteochondroma on the left side, surgery was not undertaken. The evaluation made 15 months postoperatively, showed no recurrence of the process excised on the right side and no growth of the osteochondroma on the left.



*Fig. 3.* — The bilateral supracondylar process in case 3.

### CASE 3

A 23-year-old right-hand dominant female working as a civil servant had pain in both arms, especially in her right, of 3 years duration. She stated that the pain increased when she used her arms and that the pain was relieved by analgesics. She felt weakness in her arms and hands.

On physical examination, she had a fixed solid mass, painful on palpation 5 cm proximal to the right medial epicondyle. Extension and pronation of the elbow produced pain in the arm and forearm. There was no motor weakness, sensory defect or vascular pathology. Xray films demonstrated a spur on the medial side of the right supracondylar region, with its tip pointing distally; the humeral cortex was intact. This was considered to be a supracondylar process. Similar findings were made in her left arm. The patient was diagnosed as having bilateral supracondylar processes (fig. 3). She did not accept our suggestion for surgery and could not be followed-up.

### DISCUSSION

In 1854, Sir John Struthers described a supracondylar process (or spur) which was a bony projection on the anteromedial aspect of the humerus,

about 5 cm above the medial epicondyle. He also described a fibrous band extending from the supracondylar process to the medial epicondyle. This is now known as the ligament of Struthers (1). The incidence of the supracondylar process is 0.3%-2.7% of the population (3). It can be uni- or bilateral. However, bilateral compression is rarely observed (3, 4).

A supracondylar process or ligament may cause symptomatic compression of the median nerve and/or brachial artery (1, 3, 6). More rarely, ulnar nerve compression can also occur if the fibromuscular band from the process, instead of being attached to the medial epicondyle, extends downward as a band which blends with the fibrous arch between the two heads of the flexor carpi ulnaris (1, 2, 8). It was noted that the median nerve and brachial artery were lying underneath the ligament of Struthers in one of our patients. These structures were excised preserving the artery and nerve. There was no pathology in the other soft tissues. The patient's complaints had disappeared when he was seen one and a half months postoperatively. In one out of three cases that we encountered we have identified a bilateral spur. However, on the examination of both arms of the patient, there was no finding suggesting arterial or nerve compression on one side.

The complaints vary according to the severity of the nerve and arterial compression (3, 7). Nerve compression is typically associated with the presence of a supracondylar spur, measuring anywhere from a few millimetres to 20 mm in length (3). The diagnosis of the process and evaluation of the amount of compression of the neurovascular bundle can be made by EMG and Doppler evaluation, together with physical examination. Nerve conduction velocity testing and electromyography have rarely been helpful in confirming the diagnosis but have been useful in identifying concomitant nerve compression at other sites in the limb (3, 7). The symptoms have generally begun insidiously but have occasionally had an acute onset following fracture of the supracondylar spur (2, 3). The anteroposterior radiographic view is most important since the lateral view may fail to show the spur on the anteromedial surface of the humerus (2).

A supracondylar process should be differentiated from osteochondroma. The spur is oriented distally, towards the elbow joint and there is no discontinuity in the cortex of the humerus. An osteochondroma points away from the joint. X-ray films of the supracondylar process show an intact underlying humeral cortex, whereas in an osteochondroma, the cortex of the tumor is continuous with the humeral cortex. Heterotopic bone such as myositis ossificans may also mimic a supracondylar process (2). One of our patients had a supracondylar process on the right and an osteochondroma on the left. The process was removed surgically, and the osteochondroma was followed-up. There was no change in the mass on the evaluation after 15 months.

If there is neurovascular compression, continuous pain or fracture in the supracondylar process, surgery is indicated (3, 5, 7). Treatment consists of excision of the supracondylar spur and the associated ligament of Struthers. The spur has been reported to recur, and it is therefore recommended that the spur be removed together with the overlying periosteum (3, 5).

In conclusion, two of our three cases were operated. One of these patients had median nerve compression and the other had long standing pain. One patient with bilateral spurs did not accept our suggestion for surgery although she had pain. One of the patients who were operated had osteochondroma at the supracondylar region of the other extremity. As documented in our cases and review of the literature it is important to emphasize the characteristics of spurs as an anatomic variant and the differential diagnosis with osteochondroma.

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## SAMENVATTING

*M. SUBASI, C. KESEMENLI, S. NECMIOGLU, A. KAPUKAYA, M. DEMIRTAS. Supracondylar process of the humerus.*

Vier gevallen worden gerapporteerd in drie patiënten van een symptomatische supracondylaire processus en de kenmerken worden vergeleken met die van een osteochondroma. De drie patiënten hadden lokale pijn ; een had compressieverschijnselen van de n. medianus. Een had een supracondylaire processus samen met een osteochondroma van de tegenovergestelde elleboog. Twee patiënten werden geopereerd ; een derde met een bilaterale processus weigerde ingreep. De symptomen verdwenen in de geopereerden.

## RÉSUMÉ

*M. SUBASI, C. KESEMENLI, S. NECMIOGLU, A. KAPUKAYA, M. DEMIRTAS. L'apophyse sus-condylienne de l'humérus.*

Les auteurs présentent 4 cas d'apophyse sus-condylienne de l'humérus observés chez 3 patients. Les caractéristiques de cette apophyse sus-condylienne sont passées en revue, et comparées à celles de l'ostéochondrome. Les trois patients se plaignaient de douleurs et l'un d'entre eux avait des signes de compression du nerf médian. Un patient présentait d'un côté une apophyse sus-condylienne et du côté opposé un ostéochondrome de la région sus-condylienne de l'humérus. Une patiente qui présentait une apophyse sus-condylienne bilatérale a refusé le traitement chirurgical ; les deux autres ont été opérés, avec disparition de la symptomatologie.