

Fracture of Supracondylar Process of the Humerus

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كسر في نتوء ما فوق اللقمة لعظم العضد

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الملخص: نتوء اللقمة في عظم العضد هو شذوذ هيكلية نادر وهو غالباً ما يوجد عرضياً عندما تؤخذ أشعة سينية لغرض ما. والنتوء يمكن أن ينكسر مسبباً ألماً وورماً متحركاً مؤلماً فوق الجهة الأنسية للذراع. وأعراض عصبية - وعائية وإعتلالات عصبية انحصارية. في هذا التقرير تم وصف هذا الشذوذ مع كسر في حالات سريرية مع مراجعة الأدبيات الطبية.

مفتاح الكلمات: كسور عضدية، العصب المتوسط، الإعتلالات العصبية الانحصارية، العظم الغضروفي، تقرير حالة، عمان.

ABSTRACT The supracondylar process of the humerus is a rare skeletal anomaly, which is usually an incidental finding while an X-ray is done for some other purpose. The process can fracture resulting in pain and tender mobile swelling over the medial aspect of the arm, and consequent neurovascular symptoms, or entrapment neuropathies. The anomaly, which fractured in a clinical situation, is described, followed by a review of the literature.

Keywords: Humeral fractures; Median nerve; Entrapment neuropathies; Osteochondroma; Case Report; Oman.

THE SUPRACONDYLAR PROCESS OF THE humerus is a rare skeletal anomaly seen in about 1 % of human beings and usually detected accidentally. There are many potential sites for compression of the median nerve in the arm resulting in entrapment neuropathies. The least common cause of compression is the supracondylar process and the supracondylar foramen.¹ Rarely, this can present as claudication of the forearm. The spur can fracture resulting in painful swelling over the medial aspect of the arm.

CASE REPORT

A forty year old man presented at Ibri Regional Hospital, Oman with a painful right elbow following a road traffic accident. He had an undisplaced fracture of the ala of the sacrum, with a break in the inferior pubic ramus. There was a tender mobile swelling over the medial aspect of the distal humerus which was noticed on admission. There was no distal neurovascular deficit. X-rays revealed a fracture of the supracondylar

process.

The patient was given an arm sling for three weeks. Subsequent periodical assessment did not reveal any neurovascular compromise.

DISCUSSION

A supracondylar process, an anomaly seen in about 1% of the population, is a bony projection found about 5-7 cm above the medial epicondyle of the humerus. It arises from the anteromedial aspect of the distal humerus and is directed downward, forward and medially pointing to the medial epicondyle. A fibrous band called the ligament of Struthers, is typically associated with the supracondylar spur and connects it to the medial epicondyle, thereby forming a ring. The median nerve and the brachial artery pass through this. It is usually an incidental finding when X-rays are taken for some other purpose. The fibrous band of Struthers corresponds to the lower part of the tendon of the vestigial latissimocondyloideus muscle seen in climbing mammals.² The supracondylar process, the fibrous



Figure 1: Oblique view of the right elbow showing supracondylar process

band and humerus form a foramen. This is similar to the supratrochlear foramen seen in many animals. Accessory slips of pronator teres may arise from the supracondylar process.³ The incidence varies from 1-3.5%.^{4,5}

Knox in 1841 first reported its occurrence in man, as it was previously thought to be present only in animals.⁶ The supracondylar process was described in detail by Struthers in 1849.^{1,7} In 1930, Lund presented the first case of a fracture of the supracondylar process.⁶ The process gets fractured occasionally when it is felt as a tender mobile piece of bone just above the elbow medially and it is easily made out in radiographs. If it has fractured, the treatment is excision with due care to the neurovascular structures. Conservative management is recommended if there are no neurovascular symptoms after a fracture.⁸

Compression of the nerve or artery can occur at many sites in the upper limb, and the least common cause of compression is the supracondylar process and the supracondylar foramen.¹ The supracondylar foramen may be a site for entrapment of the brachial artery and the median nerve.³ Solieri in 1929⁹ first described the spur and the ligament as a cause of median nerve compression. The symptomatology can mimic carpal tunnel syndrome or may cause features of claudication pain in the forearm. The branching pattern of the median nerve in the forearm is abnormal in those with a spur and a Struthers ligament.⁹ Occasionally, the ulnar nerve may be stretched over the spur and can result in ulnar nerve palsy. The symptoms are exaggerated by active extension and pronation of the forearm. It should be differentiated from osteochondroma, which projects away from the elbow joint, and the bony cortex of the humerus is continuous with the tumour.¹⁰ Usually it is seen in an asymptomatic patient as a painless mass or on an X-ray taken for some other purpose. The anatomic relationship with the neurovascular structures is well demonstrated by magnetic resonance imaging (MRI).¹⁰ Pecina et al recommend MRI in peripheral nerve compression syndromes, and they reported an anomaly which they named "incomplete Struthers ligament". In their case though the ligament was incomplete it functioned the same way as a complete ligament.¹¹

CONCLUSION

Purpose of this paper is to raise awareness of this entity and its clinical significance. It should also be differentiated from the osteochondromas arising from the lower medial border of the distal humerus. Distal humeral osteochondromas project away from the elbow. In a patient with pain and sensory disturbance of the forearm and hand, the elbow should be routinely examined for the presence of a supracondylar spur.

REFERENCES

1. Kessel L, Rang M. Supracondylar spur of the humerus. *J Bone Joint Surg* 1966; 48B:765-769.
2. Curtis JA, O'Hara AE, Carpenter GG. Spurs of the mandible and supracondylar process of the humerus in Cornelia de Lange syndrome. *Am J Roentgenol* 1977; 129:156-158.
3. Koshy S, Rabi S, Indrasingh I, Vettivel S. Two anatomical variations associated with potential vascular entrapment in the upper limb. *Eur J Anat* 2003; 7:97-100.
4. Pieper I. On the incidence of the supracondyloid proc-



Figure 2: *Computed tomography scan (3-D) showing supracondylar process*



Figure 3: *Computed tomography scan (axial view) showing healing of the supracondylar process fracture*

ess. Am J Phys Anthrop 1925; 8:169-171.

5. Doane CP. Fractures of the supracondylar process of the humerus. J Bone Joint Surg 1936; 18:757-759.
6. Newman A. The supracondylar process and its fracture. Am J Roentgenol 1969; 105:844-848.
7. Bartels RHMA, Grotenhuis JA, Kauer JMG, The arcade of Struthers: an anatomical study. Acta Neurochir 2003; 145:293-300.
8. Kolb LW, Moore RD. Fractures of the supracondylar process of the humerus-Report of two cases. J Bone Joint Surg 1967; 49:532-534.
9. Bilecenoglu B, Uz A, Karalezli N. Possible anatomic structures causing entrapment neuropathies of the median nerve: An anatomic study. Acta Orthop Belg 2005; 71:169-176.
10. Lordan J, Rauh P, Spinner RJ. The clinical anatomy of the supracondylar spur and the ligament of Struthers. Clin Anat 2005; 18:548-551.
11. Pecina, Boric I, Anticevic D. Intraoperatively proven anomalous Struthers ligament diagnosed by MRI. Skel Radiol 2002; 31:532-535.