Introduction

Supracondylar process of humerus is a well-known variant that has drawn attention of anatomists, anthropologists and clinicians for a long time. Supracondylar process of humerus is an occasional hook shaped process, 2-20 cm in length, which projects from the anteromedial surface of the shaft, approximately 5 cm proximal to medial epicondyle. It is curved downwards and forwards and its pointed apex is connected to the medial border, just above the medial epicondyle by a fibrous band to which part of pronator teres is attached [1].

The process with its ligamentous band is known to cause compression of median nerve and brachial artery [2–5]. During routine osteology class for students, we came across a supracondylar spur in a left humerus. Supracondylar process is seldom reported among South Indians. The morphological basis, clinical significance of the process will be discussed in the article.

Case Report

Supracondylar process was noted in a left humerus of unknown age and sex during osteology classes for students. The dimensions of the supracondylar process were measured using vernier calipers and photographed (Figure 1). The process was in the form of a curved spine 1.3 cm long. Its base was 1 cm wide and the process projected anteromedially at an angle of 70 degrees from the shaft (Figure 2). The tip of the spine was at a distance of 4.5 cm from the medial epicondyle. It was 6.1 cm above the trochlea and 24.3 cm inferior to the highest point on the head of humerus.

Discussion

Kessel and Rang mentioned Dr. Knox (1841) as one of the earliest researchers to study the supracondylar process in man. Dr. Knox observed the supracondylar foramen in a jaguar during his studies on comparative anatomy and he subsequently came across a supracondylar process in human cadavers that closely resembled the foramen seen in jaguar [3]. Various anatomists have documented the prevalence of supracondylar process in different races of man since 18th century. The incidence reported in the literature ranges from 0.4% to 2.7% [7].

The supracondyloid process, also called the epicondylic or supraepitrochlear process, is a phylogenetic vestige of the
Supracondylar process of humerus

Supracondylar process of the humerus is a bony prominence found in many extinct and living reptiles, primitive primates, lemurs, some American monkeys, most marsupials, some carnivores, especially members of the cat family. It is occasionally present in the orangutan and gorilla [9].

It has a protective role in members of the cat family. It forms the roof of a foramen that transmits the neurovascular bundle. The ligament that is sometimes associated with the spur in man represents lower part of the tendon of a vestigial muscle latissimo-condyloideus seen in climbing mammals which extends from the tendon of insertion of latissmus dorsi to the medial epicondyle [3]. Barnard and McCoy came across a patient in whom a slip of pronator teres was attached to the spur [2]. Mittal and Gupta reported a peculiar case where the fibromuscular band from the process blended with the fascia in front of the cubital fossa instead of attachment to the medial epicondyle. They suggested that the band could have been the aberrant part of pronator teres muscle [4].

Various studies have been done on the incidence of supracondylar spur in different races of man by palpation method in living, radiography, bone studies and cadaveric studies. In 1954, Parkinson conducted a careful radiological search for supracondylar process in 500 consecutive patients undergoing routine gastrointestinal investigation and reported an incidence of 0.4% [9]. A study done on Turkish individuals using radiographs reported an incidence of 1% [7]. Another study on Nigerians done using bones recovered from cadaveric dissection showed an incidence of 2.5% [8]. The reported incidence of the spur in Indian population in a previous study is 0.26% [10].

Previous studies have reported a relatively higher incidence of the spur in European Caucasians as compared to colored races [7]. Such difference may be attributed to the inherent characteristic of the races. Newman observed the occurrence of the process in 1 of 10 siblings and its absence in both the parents and opined that the process must be a recessive hereditary trait [6].

Many cases, in which the spur and the ligamentous band attached to it are reported to cause compression of median nerve and brachial artery, have been documented in literature. The symptoms of neurovascular compression are often exaggerated by extension and pronation of the forearm [2]. In case of high division of brachial artery, the ulnar artery

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**Figure 1.** Supracondylar process (arrowhead) of left humerus.

**Figure 2.** Supracondylar process (arrowhead) of the humerus in the form of a curved spine projecting anteromedially.
may be compressed while passing beneath the ligament along with the median nerve. Kessel and Rang reported such a case in which the ischemic symptoms were completely relieved by surgical excision of the process and the ligament attached to it [3]. Mittal and Gupta reported a rare case in which compression of median nerve, ulnar nerve and brachial artery were observed in the same individual. The median nerve and the brachial artery were stretched and kinked over a tense band that extended from the spur to the deep fascia in front of the cubital fossa. Also, ulnar nerve was bound by a fibrous band to the back of the humerus from behind the bony spur up to the medial epicondyle [4].

Rare cases of fractures of the process have also been reported. Fracture of the process following trauma may cause median nerve compression symptoms as reported by Newman [6].

The process may be misdiagnosed as an osteochondroma. Subasi et al. described a patient with a supracondylar process on the right side and an osteochondroma on the left side. The supracondylar spur points towards the joint while an osteochondroma typically projects away from the joint [5].

Supracondylar process of humerus is an incidental finding in radiographs of individuals taken for trauma. It can be diagnosed by palpation and radiography. Since the routine antero-posterior radiographs may obscure the spur that is present on the anteromedial aspect of the humerus; oblique view is preferred [2].

Symptoms of neurovascular entrapment have to be treated by surgical resection of the spur. It is necessary that the spur has to be resected with its periosteum and the binding fibers of pronator teres that arise from it to prevent regeneration of the spur and recurrence of symptoms [2].

Because of its potential to cause neurovascular compression, though rarely, it is important that the supracondylar process be recognized clinically.

References