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# INCIDENCE OF THE SUPRACONDYLAR SPUR OF THE HUMERUS IN CENTRAL INDIAN POPULATION: A CROSS SECTIONAL STUDY

**Dr. Rolly Chandrakar[1], Dr. Kunal Chandrakar[2]**

[1]Assistant Professor Dept. of Anatomy Chandulal Chandrakar Memorial Medical College, Kachandur Durg Chhattisgarh
[2]Senior Resident Dept. of Radiology Chandulal Chandrakar Memorial Medical College, Kachandur Durg Chhattisgarh

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**Corresponding author:** Dr. Kunal Chandrakar
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**Abstract**

**Background**: The supracondylar spur of the humerus is a hook-like, bony spine that protrudes distally from the humerus's antero-medial surface. It is located around 5 cm from the medial epicondyle. Its length ranges between 2 and 20 mm. Ligament of Struthers may be used to connect the supracondylar spur to the medial epicondyle in some circumstances. The brachial artery and the median nerve may travel beneath the band, making it prone to compression.

**Aims & objectives**: The goal of this study was to see how common supracondylar spur is in Central Indian dry humeri, as it can help with the differential diagnosis of supracondylar syndrome.

**Materials and Methods**: 224 dried humeri from tertiary healthcare centres in Central India were studied for the period of three years in the departments of Anatomy and Forensic Medicine, including 106 from the right side and 118 from the left. The bones were thoroughly inspected for the presence of a supracondylar spur. A digital calliper was used to collect measurements after the findings.

**Results:** Only two left-sided humeri out of 224 dried humeri studied had a supracondylar spur, which was triangular in shape and projected forwards and medially from the anteromedial surface. The spur protruded 0.4 cm from the surface, with a vertical length of 1 cm and a width of 0.8 cm. The medial epicondyle was 5.2 cm away from the spur.

**Conclusion**: The supracondylar spur is a natural anatomical variation rather than a chronic disease of the bone. Compression of the median nerve and claudication of the brachial artery are possible side effects.

**Key Words**: Supracondylar Spur, Humerus, Median Nerve, Brachial artery and Supracondylar Syndrome.

## Introduction

The supracondylar process of the humerus is also known as the supra epitrochlear, epicondylar, or epicondylic process. The anteromedial surface of the humerus has a hook-like bony protrusion[1]. Ligaments were inserted into a section of the aberrant fibres of the corocobrachialis and pronator teres muscles as a result of this operation[2]. The brachial artery and the median nerve pass beneath this process. The process was discovered in apes and monkeys between 1818 and 1819 and is documented in Tiemann's Tabulae Arterium, with a prevalence of 0.1 percent to 5.7 percent. According to some of the authors, climbing animals have a proper anatomical structure[3].

A supracondyloid process was found in 6 of 515 (1.16 percent) whites, but only once in 1,000 (0.1 percent) blacks, according to another study. The supracondylar spur of the humerus is a hook-like, bony spine that protrudes distally from the humerus's antero-medial surface[4,5]. It is located around 5 cm from the medial epicondyle. Its length ranges between 2 and 20 mm. Ligament of Struthers may be used to connect the supracondylar spur to the medial epicondyle in some circumstances[6]. The median nerve and brachial artery may travel beneath the band in such circumstances, making it prone to compression. Supracondylar process syndrome is caused by compression of the brachial artery and median nerve beneath the ligament[7,8]. The compression of the median nerve causes ischemic discomfort and claudication in the forearm, as well as paranesthesia, weakness, and muscular wasting.

## Aims & Objectives:

In light of this, a study was conducted to determine the prevalence of supracondylar spur in Central Indian dry humeri, which is important in the differential diagnosis of supracondylar syndrome.

## Materials and Methods

224 dried humeri from tertiary healthcare centres in Central India were studied for the period of three years in the departments of Anatomy and Forensic Medicine, including 106 from the right side and 118 from the left. The bones were thoroughly inspected for the presence of a supracondylar spur. A digital calliper was used to collect measurements after the findings. We examined for any osseous projection from distal part through bright sunlight.

## Results

Only two left-sided humeri out of 224 dried humeri studied had a supracondylar spur, which was triangular in shape and projected forwards and medially from the anteromedial

surface. The spurs protruded 0.4 cm from the surface on average, and the base was one centimeter length vertically and 0.8 centimeters wide. The medial epicondyle was 5.2 cm away from the spurs. The distance between the spurs' tips and the trochlea's tip was 6.4 cms. Between the apex of the spine and the medial supracondylar ridge, the distance was 0.9 cm. The spine was 4.2 cm away from the nutritive foramen. These two humeri were 31.5 cm in length on average. The incidence of the spur in the present study was 0.89 %.

**Table 1: Shows the measurements of supracondylar spur**

| SL. No | Supracondylar spur of Left Homarus | Average Measurements in cms |
|---|---|---|
| 1. | Length of spine | 0.4 |
| 2. | Distance of spine from medial epicondyle | 5.2 |
| 3. | Breadth at the base of spine | 0.8 |
| 4. | Distance of spine from nutrient foramen | 4.2 |
| 5. | Distance between the tip of the spine to medial supracondylar ridge | 0.9 |
| 6. | Distance between the tip of the spur and tip of the trochlea | 6.4 |

## Discussion

It's important to distinguish a supracondylar process from an osteochondroma. There is no discontinuity in the cortex of the humerus, and the spur is pointed distally, towards the elbow joint[9,10]. An osteochondroma is a protrusion of the joint that points away from it. The underlying humeral cortex is intact on X-ray films of the supracondylar process, whereas the tumour cortex is continuous with the humeral cortex in an osteochondroma[11]. Myositis ossificans, a heterotopic bone, can also seem like a supracondylar process. Because the lateral view may fail to show the spur on the anteromedial surface of the humerus, the anteroposterior radiography view is the most relevant. There have also been a few reports of process fractures[12,13]. According to Newman, a fracture of the process following trauma might elicit symptoms of median nerve compression. Because the spur has been known to reoccur, it is recommended that it be removed along with the overlying periosteum[14,15]. The prevalence of the supracondylar process of the humerus in the general population is extremely low, ranging from 0.3 to 2.7 percent. Gruber 2.7 percent, Danforth 0.5 percent, Adachi 0.8 percent, Terry 1.16 percent, Hrdlika 1 percent, Dellon 1.15 percent, Parkinson 0.4 percent, Natsis 1.3 percent, Gupta 0.26 percent, Oluyemi 2.5 percent, Prabahita 1.25 percent found comparable results[10-19]. Compression symptoms such as severe paraesthesia and hyperesthesia of the hand and fingers, as well as ischemia discomfort in the forearm, may be caused by a supracondylar spur. Decompression, or releasing the Struthers ligament linked to the spur and removing the spur with the overlaying periosteum, is the treatment. When compared to other studies, the dimensions of the supracondylar process in our data were slightly different[16]. In our investigation, the length of the spine was 0.4 centimeters; similar results were observed in Gupta RK's study (0.3 cm), while Oluyemi KA and Prabahitha B's investigations indicated 1.6 cm and 1.1 cm, respectively. The distance between the spine and the median epicondyle was 5.2 centimeters. Oluyemi KA reported comparable results (5.5 cm), although Gupta RK and Prabahitha B found 6.5 cm and 4.4 cm, respectively. Our study found 0.8 cm of width at the base of the spine, whereas Gupta RK found 1.1 cm and Prabahitha B found 1.5 cm. In our investigation, the distance between the spine and the nutritional foramen was 4.2 cm, whereas Oluyemi KA found 5.3 cm and Prabahitha B found 6.5 cm. Previous research has found that the supracondylar process may be distinguished from osteochondroma, and that the spur is positioned distally toward the elbow joint and ends in the humeral cortex. Despite the fact that supracondylar spur is a common anatomical anomaly, this study found that prevalence varies amongst ethnic groups, ranging from 0.1 percent to 2.7 percent[20]. When a supracondylar spur is present, it can cause neurovascular symptoms, and this study proposes that a similar study with a large sample size be conducted among people of different ethnicities.

## Conclusion

The supracondylar process is sometimes misinterpreted as a bone disease rather than a typical anatomical variation. It is normally clinically silent, but it can become symptomatic if it manifests as a mass or is linked to signs of median nerve compression and brachial artery claudication. As a result, Anatomists, Anesthetists, Radiologists, and Orthopedic Surgeons must have a thorough understanding of this uncommon anatomical difference.

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