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MORPHOMETRIC STUDY OF CALCANEAL SPUR AND ITS CLINICAL IMPORTANCE

Anatomy

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ABSTRACT

INTRODUCTION: Calcaneum is the key and largest skeletal bone of foot. Which plays a significant role in transmission of weight, weight bearing, posture and gait of an individual. During examination of dry human Calcaneum in osteology lab in the Department of Anatomy, Osmania Medical College, Koti, Hyderabad, Telangana. We found that 12 Calcaneum showing bony projection [spur].Out of which mostly from the Medial tubercle and few from both Medial and Lateral tubercles. .The average length, breadth, thickness were 24mm, 20mm, 3mm respectively. Calcaneal Spur is due to constant wear and tear resulting from pull of Flexor Digitorum Brevis and ossification of plantar fascia. Hence knowledge of spur is of great importance to Surgeon, Radiologist and Anatomist. **AIM AND OBJECTIVES:** To observe Calcaneal Spur and their Variations in 100 Normal bones. **MATERIALS AND METHODOLOGY:** 100 Dried Human Calcaneal bones, Vernier caliper and Measuring Scale. **RESULT:** Calcaneal spur is seen in 12 Calcaneum bones. Percentage of Bony projection out of 100 Calcaneal bones is 12 % **CONCLUSION:** Calcaneum is the strongest, largest and weight bearing bone related to structures like Achilles tendon and Plantar fascia, which plays an important role in Walking. Probability of presence of a Bony Spur should be known to the Orthopedics Surgeons, during Endoscopic Plantar fascia release, Radiologist, and Anatomist.

KEYWORDS

Calcaneum, Calcaneal Spur, Plantar Spur, Dorsal Spur.

INTRODUCTION:

Calcaneum is the longest, strongest and biggest of all the tarsal bones of the proximal row (1, 2).It is also known as heel bone and forms an important component of the skeleton of the hind foot and prominence of the heel. This bone is unique, as it is the first tarsal bone to ossify. The purpose of the calcaneus is to transmit the weight of the body and act as a strong lever for the calf muscles (3, 4).It is well designed to sustain high tensile, bending and compressive forces. However, high instantaneous loads often result in fracture (5). It is located posterior inferior to the talus, providing support to the ankle joint. It measures about 3.4 inches in length and about 1.4 inch at its widest point (6,7).Calcaneum fractures are also known as "Lover's Fracture," or "Don Juan Fracture." Its name is derived from the fact that a lover jumps from great heights while trying to escape from the lover's spouse (8).If untreated, they can interfere with normal coupled motion of ankle and subtalar joint and result in permanent pain, loss of motion and deformity (9).The morphology of human calcanei and their morphological changes are important to anatomists, its important is more for orthopedic surgery, physical therapy and rehabilitation, for treatment of Plantar fasciitis and Achilles tendinitis treatment.

MATERIALS AND METHODOLOGY :

This study is done during observational study in osteology lab of department of Anatomy, Osmania medical college, Koti, Hyderabad, Telangana .We have taken 100 dried calcaneal bone excluding the pathological / abnormal bones of unknown sex and age.. 100 Calcaneum were observed, out of which 12 Calcaneum bones have abnormal bony projections from the medial tubercle and few from the lateral tubercle. The incidence is 12 %.The length, breadth and thickness of the spur are measured with the help of Vernier caliper and measuring scale. The results were analyzed.

Length of the spur: it is taken from the root of the spur to its tip
Breadth of the spur: it is taken from maximum width at its root
Thickness of the spur: it is taken at the most distal part of the tip of the spur

The measurement are as follows.

S.no	Type of Spur	Length (mm)	Breadth (mm)	Thickness (mm)
1	Plantar	25	23	05
2	Plantar Dorsal	20 27	18 22	03 02
3	Plantar Dorsal	26 22	23 21	04 04
4	Plantar	22	20	03
5	Plantar	22	14	04
6	Plantar	24	20	03
7	Plantar	20	16	03
8	Plantar Dorsal	27 28	22 21	03 05
9	Plantar Dorsal	20 27	14 18	04 04
10	Plantar	24	21	03
11	Plantar	20	16	03
12	Plantar	25	23	04

DISCUSSION:

Bone spurs are bony projections that develop along the edges of bones. Also called osteophytes, bone spurs often form where bones meet each other in your joints. Bony Projection may be formed when osteogenic layer lying beneath the periosteum is detached thereby activating the osteocytes. These lay down the extra bony growth. Bony projections/ bony out growths are also known as exostosis. Bony out growths are common in shoulders, knees and feet etc. In our study the bony spur is seen on plantar, dorsal and in few bones both plantar and dorsal spur are seen. We have taken the length, breadth and thickness as

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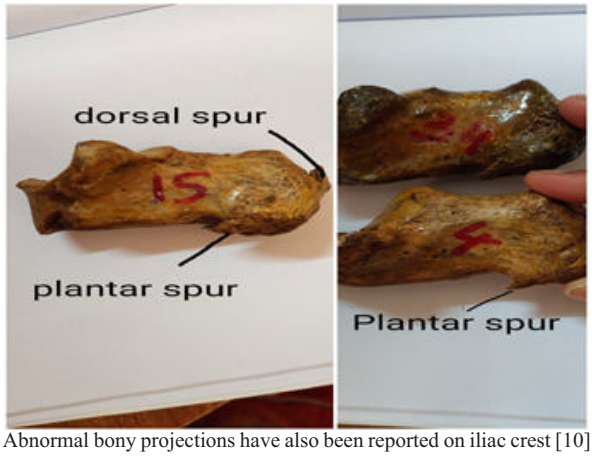

Abnormal bony projections have also been reported on iliac crest [10] obturator foramen [11] and external occipital protuberance (Singh R, unpublished data). Inflammation of the Achilles tendon can lead to the formation of a bone spur at the back of the heel bone (calcaneus bone). Inflammation of the tissue on the bottom of the foot, plantar fasciitis, can lead to a bone spur at the underside of the heel bone. These bone spurs are sometimes referred to as heel spurs [12].Higher blood calcium levels may lead to calcium deposition leading to formation of bony projections. Moreover, exostosis may be due to disturbance of endochondral ossification which may be hereditary transmitted.

This bony spur may compress structures present lower to it based on the position of the spur either plantar or dorsal .The plantar spur compress the plantar fascia and dorsal spur compress Achilles tendon causing severe pain during walking. The bony projection may injure the structures surrounding the bony growth.

CONCLUSION:

This study is useful for surgeons while doing surgeries around calcaneal, for treatment of plantar fasciitis and Achilles tendonitis. Helpful for surgeon in endoscopic plantar fascia release. And for anatomist to identify morphometric variations in normal bone**.**

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