

Study of the Articular Facet on the Superior Surface of the Calcaneum

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Abstract

The calcaneum is the longest and largest of the tarsal bones. It articulates superiorly with the talus to form the subtalar joint. In the middle 1/3rd of the superior surface of the calcaneum, there is an oval shaped posterior facet for articulation with the body of the talus. In the anterior 1/3rd of the calcaneum, there are middle and anterior facets for articulation with the head of the talus. **Aim:** is to determine the variation in the articular facet on the superior surface of calcaneum. **Methods:** 400 dry and grossly normal human calcanei were collected in the department of Anatomy, Terna Medical College. Out of all the 400 human calcanei, 200 were taken from right side and 200 were from left side. They were divided into 3 types: The three types were according to Bunning and Barnett (1963). [1] Type A: bears 3 facets, Type B: bears 2 facets, Type C: bears 1 facets. **Results:** Type B was most common pattern found in our study and in type B sub type I was predominant. The sub type I middle and anterior facets confluent pattern has been found dominants in Africans [1,2] and in Indians. [3] **Conclusion:** Type B (2 distinct facets) was most common in our study. This study indicates that the racial differences were found in the arrangement of articular facets on the superior surface of calcaneum. This can be useful for orthopedic surgeons when they perform calcaneal osteotomy.

Keywords: Calcaneum; Articular; Tarsal; Facet.

Introduction

The calcaneum is the largest tarsal bone and projects posterior to the tibia and fibula as a short lever for muscles of the calf attached to its posterior surface. It is irregularly cuboidal, its long axis being inclined distally upwards and laterally [4] the calcaneum, articulates superiorly with the talus to form the subtalar joint. In the middle 1/3rd of the superior surface of the calcaneum, there is an oval shaped posterior facet for articulation with the

body of the talus. In the anterior 1/3rd of the calcaneum, there are middle and anterior facets for articulation with the head of the talus. [5] This facet articulates with the head of the talus, and may be divided in about half the cases by a non-articular zone creating middle and anterior talar facets the incidence of which varies with race and sex. [6] Bunning and Barnett [1] (1963) have observed that there are three types of variations in the arrangement of facets. They have classified these variations as follows:

Type A: There are three facets separated by variable intervals.

Type B: There are two facets, anterior and middle which are either continuous or have a notch between them.

Type C: There is only one facet i.e. the three form a continuum. [7]

There is considerable variation in the number and arrangement of these facets. Using parameters such as degree of

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separation, fusion, and shape, several workers have described types and preponderance of articular facets on the anterior third of the calcaneum in certain population groups like African, Indian, British, Egyptian, and Spanish.[1-3,7,8] However, this subject is interesting but comparing the larger population of the Indian subcontinent and the amount of study carried on the variation of facets is much less.

Material and Method

400 dry and grossly normal human calcanei were collected in the department of Anatomy, Terna Medical College. Out of all the 400 human calcanei, 200 were taken from right side and 200 were from left side. They were divided into 3 types:

The three types were according to Bunning and Barnet (1963)

Type A: Bears 3 facets

Type B: Bears 2 facets

Type C: Bears 1 facet

Observation

All 400 dry and grossly normal human calcanei were observed for presence or absence of articular facets & accordingly they were divided in to three types.[1]

1] Type A Variety

In type A, the middle facet (on the

Fig 1: Showing Type A Variety of Facets



Fig 2: Showing Type B Variety of Facets



Fig 3: Showing Type B-Sub Group 1 Variety of Facets



sustentaculum) and the anterior facet were distinct with a variable degree of separation. Based on this finding, three subtypes were designated: subtype A occurred with a frequency of 22.75% of the total sample with moderate separation (5-10 mm). Subtypes B (5.25%) showed narrow (<5 mm) and C (4.25%) wide (> 10 mm) separation.

2] Type B Variety

Type B was further divided in to four sub

Fig 4: Showing Type B-Sub Group 2 Variety of Facets



Fig 5: Showing Type B-Sub Group 3 Variety of Facets

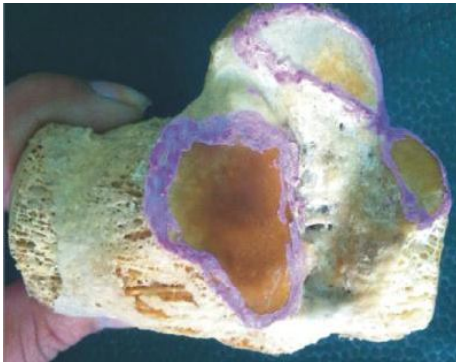


Fig 6: Showing Type B-Sub Group 4 Variety of Facets



groups:

Sub Group 1

Anterior and middle articular facets completely fused and form a single facets (Fig 3).

Sub Group 2

Anterior and middle articular facets incompletely separated from each other by means of a notch (Fig 4).

Sub Group 3

Anterior and middle articular facets separated from each other but no non-articular area intervening (Fig 5).

Table 1: Type of Articular Facet on Calcanium

Type of calcanium	Left Side N (%)	Right Side N (%)	Total N (%)
Type A	67 (33.5)	62 (31)	129 (32.25)
Type B	133 (66.5)	138 (66.5)	271 (67.50)
Type C	Absent	Absent	Absent

Table 2: Incidences of Articular Facets in Type 2 Calcaneum

Sub group	Right Side 138	Left Side 133	Total 271
I	77 (53.79)	71 (53.38)	148 (54.61)
II	18 (13.04)	24 (18.04)	42 (15.49)
III	40 (28.98)	31 (23.30)	71 (26.91)
IV	3 (02.10)	7 (05.26)	10 (03.69)

Table 3: Subtypes in Type A Calcaneum Facets

Subtypes of pattern A calcaneal facets	Number	Percentage
A: <5mm	21	5.25
B: 5-10mm	91	22.75
C: >10mm	17	4.25

Sub Group 4

Absence of articular facets (Fig 6).

Result And Discussion

*Result:*Type B was most common pattern found in our study and in type B sub type I was predominant. The sub type I middle and anterior facets confluent pattern has been found dominants in Africans[1,2] and in Indians[3], where as distinct middle and anterior facets was predominant in Europeans and half the cases in Spanish.[7]

Conclusion

Type B (2 distinct facets) was most common in our study. This study indicates that the racial differences were found in the arrangement of articular facets on the superior surface of calcaneum. This can be useful for orthopedic surgeons when they perform calcaneal osteotomy.

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