



MORPHOMETRIC STUDY OF MEDIAL MALLEOLUS IN DRY HUMAN TIBIA

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ABSTRACT

Medial Malleolus is short and thick having smooth lateral surface with a crescentic facet articulating with the medial talar surface. Shape of lateral articular surface of medial malleolus was found to be crescent shaped in all cases of the present study and when compared between the two sides, the values were slightly more towards left side. Medial malleolus along with deltoid ligament provides medial stability to ankle joint and is one of the common structure to get fractured in lower limb. The morphometric study will help orthopaedic surgeons and implant manufacturers to plan the fixation devices for this small but very important part of the ankle

KEYWORDS :

INTRODUCTION

Medial Malleolus is short and thick having smooth lateral surface with a crescentic facet articulating with the medial talar surface. Its anterior aspect is rough and posteriorly it continues as a groove on the shaft's posterior surface. The distal border is pointed anteriorly and depressed posteriorly (1).

The medial malleolus projects inferomedially from the distal end of the tibia. Its smooth anterior surface bulges beyond the distal surface, separated from it by 1mm narrow groove, continuing with the shaft's lateral surface. The medial surface of malleolus is smooth and continues above with the medial surfaces of the shaft. It is subcutaneous and easily palpable(2). In addition deltoid ligament is attached to the lower margin of medial malleolus(3).

Medial Malleolus along with the lower end of the tibia and the lateral malleolus of the fibula form a deep recess to accommodate the body of talus. The mortise made by the inferior end of tibia and the fibula is commonly considered as syndesmosis(4) The tibial articulation with the talus occurs mainly with the tibial plafond a saddle shaped facet on the distal end of the tibia and the medial surface of the medial malleolus (5). The morphometry of the medial malleolus tibia is significant when the stability of these articulations is put into account (6).

MATERIAL AND METHODS

The present study comprised of 70 dry Human tibia of adult age and unknown sex available in the Department of Anatomy. Bones were labelled from 1-70 with suffix 'R' or 'L' indicating Right or Left respectively. The tibia is one of the most studied bones by the Western workers. However, not much data is available for the study of medial malleolus. The present study is therefore designed on dry human tibia to note the following parameters of medial malleolus:

1. Shape of lateral articular surface of medial malleolus
2. Anteroposterior diameter of lateral articular surface of medial malleolus.
3. Superoinferior diameter of lateral articular surface of medial malleolus in its anterior part
4. Superoinferior diameter of lateral articular surface of medial malleolus in its posterior part.

RESULTS AND DISCUSSION

1. Shape of lateral articular surface of medial malleolus: it was found to be crescent shaped in all bones of the present study.
2. Anteroposterior diameter of lateral articular surface of medial malleolus is tabulated in the given table 1

TABLE 1: ANTEROPOSTERIOR AND SUPEROINFERIOR DIAMETERS OF LATERAL ARTICULAR SURFACE OF MEDIAL MALLEOLUS

Diameters		Side	Mean + SD(n)	Range
Anteroposterior		Rt	20.90+ 1.87 (35)	18.41-26.09
		Lt	22.21 +2.40 (35)	18.97-27.17
Superoinferior	Anterior part	Rt	13.72 + 1.41 (35)	10.63-18.02
		Lt	15.43 ± 1.68 (35)	11.77-19.21
	Posterior part	Rt	5.85 ± 1 (35)	3.75-8.24
		Lt	6.15+0.90 (35)	4.68-7.69

Table 1 shows the mean value of anteroposterior diameter of lateral articular surface of medial malleolus on two sides of the present study. On the right side it was found to be 20.90 ± 1.87 mm (Range=18.41-26.09). The corresponding values on the left side were 22.21 ± 2.40 mm (Range= 18.97-27.17mm). When compared between the two sides, the values were slightly more towards left side.

1. Superoinferior diameter of lateral articular surface of medial malleolus in its anterior part:

Table 1 also shows the superoinferior diameter of lateral articular surface of medial malleolus in its anterior part as seen in the present study. On right side, it was 13.72 ± 1.41 mm (Range=10.63-18.02). The corresponding values on left side were 15.43 ± 1.68 mm (Range=11.77-19.21 mm). When compared between the two sides, it was more on left side.

2. Superoinferior diameter of lateral articular surface of medial malleolus in its posterior part:

As it is evident from Table 1, the mean values for superoinferior diameter of lateral articular surface of medial malleolus in its posterior part on right side were found to be 5.85 ± 1.00 mm (Range=3.75-8.24mm). The corresponding values on left side were 6.15 ± 0.90 mm (Range=4.68-7.69mm). When compared between the two sides, it was more on left side, table 1 shows that the superoinferior diameter of lateral articular surface of medial malleolus in anterior part is more than in its posterior part.

Shape of lateral articular surface of medial malleolus was found to be crescent shaped in all cases of the present study as described by Standing S et al. In the present study the mean value of anteroposterior diameter of lateral articular surface of medial malleolus and the superoinferior diameter of lateral articular surface of medial malleolus in its anterior and posterior part were more on left side but for comparison no data is available literature as yet.

The results of the study done by Chandni et al illustrated that there was no statistical significance in any parameter of right and left side(7), in contrast to our study. In addition to it these morphometric

studies are also clinically important in imaging diagnosis of fracture medial malleolus(8,9)

CONCLUSION

Medial malleolus along with deltoid ligament provides medial stability to ankle joint and is one of the common structure to get fractured in lower limb. The morphometric study will help orthopaedic surgeons and implant manufacturers to plan the fixation devices for this small but very important part of the ankle.

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