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MORPHOMETRIC STUDY OF DISTAL ARTICULATING SURFACE (LOWER END) OF TIBIA IN ADULT POPULATION OF TELANGANA REGION.

Anatomy

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ABSTRACT

Introduction: The aim of this study is morphometric analysis of lower end of Tibia in adult population of Telangana region.
Materials and Methods: The study was done on 60 dry adult Tibia of unknown age and sex collected from the Department of Anatomy, Kakatiya Medical College, Warangal, Telangana state. Total 60 tibia were included in this study, out of which 26 were right and 34 were left.
Results: The maximum length of the tibial plafond on right and left are 3.4 &3.4 cm respectively. The minimum length of the tibial plafond on right and left are 2.4 & 2.5 cm respectively. The total mean values of the length of tibial plafond on right and left 2.9& 2.95 cm respectively.
The maximum width of the tibial plafond on right and left are 3.2& 3.4cms respectively. The minimum width of the tibial plafond on right and left are2.4 &2.4cms respectively. The total mean values of the width of tibial plafond on right and left are2.8 &2.9cms respectively.
The maximum measurements of vertical length of the medial malleolus on right and left are 1.8 &1.8 cms respecrively. The minimum measurements of vertical length of the medial malleolus on right and left are 1.4 &1.3 cms respecrively. The mean measurements of vertical length of the medial malleolus on right and left are 1.6 &1.6 cms respecrively.
Conclusion : This helps in add up knowledge to anatomists and clinicians for their clinical implications. It is also helpful for orthopaedic surgeons in distal end fracture of tibia and its reconstructive surgery for various implants.

KEYWORDS

Mophometry, Tibial Malleoli, Lower End Of Tibia.

INDRODUCTION:

Talocrural joint is a chief weight bearing joint of the body.[1] The weight of the body is conveyed from the tibia and fibula to the talus which distributes the weight anteriorly and posteriorly within the foot.[2] The lower end of tibia along with its medial malleolus 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.[3] The tibial articulation with the talus occurs mainly with the tibial plafond (TP); a saddle shaped facet on the distal end of the tibia and the medial surface of the medial malleolus (MM). [4] The morphometry of the distal tibia is significant when the stability of these articulations is put into account.[5] Furthermore, these morphometric parameters are also clinically important in imaging diagnosis of fractures of the TP and the MM.[6,7] Ankle is one of the most commonly injured joint and there is very limited amount of literature available on morphometry of the distal articular surfaces of tibia and fibula which will help in the reconstruction surgeries and in the construction of implants in south Indians. So, this study was undertaken to measure various parameters of distal articulating surfaces of tibia .

MATERIALS AND METHODS:

The study was done on 60 dry adult Tibia of unknown age and sex collected from the Department of Anatomy, Kakatiya Medical College, Warangal, Telangana state. Other materials Vernior caliper, tape, scale were used for taking measurements. Total 60 tibia were included in this study, out of which 26 were right and 34 were left.

Three parameters were taken from lower end of Tibia, those are

1. Maximum width(Tansverse diameter) of lower end of Tibia.
2. Maximum length (A.P. diameter) of lower end of Tibia.
3. Maximum vertical length of lower end of Tibial malleoli.

OBSERVATIONS &RESULTS:

The maximum length of the tibial plafond on right and left are 3.4 &3.4 cm respectively. The minimum length of the tibial plafond on right and left are 2.4 & 2.5 cm respectively. The total mean values of the length of tibial plafond on right and left 2.9& 2.9 cm respectively.

The maximum width of the tibial plafond on right and left are 3.2& 3.4cms respectively. The minimum width of the tibial plafond on right and left are2.4 &2.4cms respectively. The total mean values of the width of tibial plafond on right and left are2.8 &2.9cms respectively.

The maximum measurements of vertical length of the medial malleolus on right and left are 1.8 &1.8 cms respecrively. The minimum measurements of vertical length of the medial malleolus on right and left are 1.4 &1.3 cms respecrively. The mean measurements of vertical length of the medial malleolus on right and left are 1.6 &1.6 cms respecrively.

Table 1: Showing measurements done on distal end of tibia of both sides.

s.no	Name of the parameter	Right (cm)		Left (cm)		Mean value (cm)	
		max	Min	Max	Min	right	Left
1.	length (A.P. diameter) of lower end of Tibia	3.4	2.5	3.4	2.4	2.9	2.9
2.	width of lower end of Tibia (transverse)	3.2	2.4	3.4	2.4	2.8	2.9
3.	vertical length of lower end of Tibial malleoli	1.8	1.4	1.8	1.3	1.6	1.6

Table 2: Showing comparision of length of Olecranon fossa of Humerus with other authors

s. no	Name of the authors	Mean val;ues of lower articular surface of tibia max. length (AP diameter)		Mean val;ues of lower articular surface of tibia max.width (transverse diameter)	
		Right	Left	Right	Left
1.	Pamela M et. Al [8,9], (2013)	28mm	27mm	28mm	27.mm
2.	Chandni Gupta et al [10], (2017)	28mm	27mm	20mm	19mm
3.	Present study	29mm	29mm	28mm	28mm

FIG-1: Showing Transverse and Anteroposterior measurement of lower end of Tibia.

FIG-2 : Showing vertical length of medial malleolus

DISCUSSION:

The measurements of the distal end of tibia and fibula are vital in considering the stability of ankle joint, in designing of prostheses for use in ankle arthroplasty and in interpretation of diagnostic images of the ankle joint.8

Morphometric analysis results of the tibial plafond & medial malleolus studies of Pamela M,(9) and Mariani & Patella(10) are similar to our study, but morphometric study values of Chandni Guptha et al are little lower than our studies. Musa M (8) studied the Sexual dimorphism in the morphometric characteristics of the tibial plafond and medial malleolus.

CONCLUSION:

This adds up to the present knowledge and also helps anatomists and clinicians for future references. These results of the study will help in the reconstruction operations and in the construction of implants of the ankle joint in south Indian population.

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