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Study of Squatting Facets in Tibia and Talus in South Indian Population

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Abstract: ***Indians are known to be habitual squatters and also formation of squatting facets depends on the life style activities. There may be a drastic difference in the formation of squatting facets when compared to the previous studies. Also study is important for ankle reconstruction surgeries designed specifically for south Indian population considering the different life style activities. This study is done using 30 Tali (15 right sides and 15 Left sides) and 30 Tibiae (15 right sides and 15 Left sides). In tali squatting facets are present in thirty percent irrespective of the side. In tibiae the percentage of presence of squatting facets is 36.66 percent. There is a decline in the number of squatting facets when compared to the other studies. Multiple factors may contribute for the formation of squatting facets. And this difference may be because of study in different population, or difference in life style.***

Keywords: Indian, Reconstruction, Squatting, Tali, Tibiae.

1. Introduction

Talocrural joint is major weight bearing joint of the body, since human is the only known obligate bipedals[1]. Therefore the body weight is transmitted to the ground through the two lower limbs. So some great features have been evolved in humans to keep the body upright.

Habitual squatting has long been recognized to alter the skeletal morphology of the lower limb. Squatting is a resting postural complex that involves hyperflexion at the hip and knee and hyperdorsiflexion at the ankle and subtalar joints. During locomotion, the foot is rarely dorsiflexed sufficiently to bring the anterior border of the inferior extremity of the tibia into contact with the dorsum of the neck of the talus. Thus modifications of the neck of the talus and the distal tibia indicating their habitual contact have been taken as evidence of the extreme dorsiflexion of the ankle that occurs in squatting[2].

Squatting facets can also be formed due to different life style activities. Since the life style activities are modified in today's world and also the squatting habits. There may be a drastic difference in the formation of squatting facets when compared to the previous studies. Also study is important for ankle reconstruction surgeries designed specifically for south Indian population considering the different life style activities.

2. Material & Methods

This study is done in the department of Anatomy K.S.Hegde Medical Academy, Deralakatte, Mangalore by using 30 Tali (15 right sides and 15 Left sides) and 30 Tibia (15 right sides and 15 Left sides). Squatting facets are noted and photographed

3. Observation and Results

Image 1: Squatting facet in dry talus

Image 2: Squatting facet in dry tibia

3.1 Squatting Facets On Dry Talus Bones

Table 1

		Absent	*Present*
Side	Left % within	60.0%	40.0%
	Right % within	80.0%	20.0%

Table 2

Chi-square Test.		
	Value	*Exact Sig. (2-*
Pearson Chi-Square	1.429	0.427

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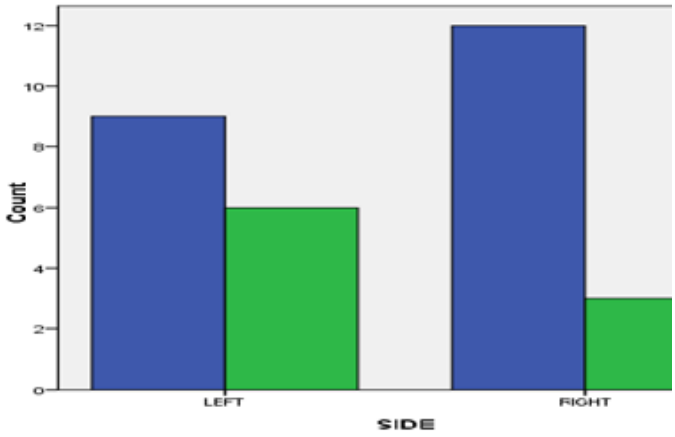


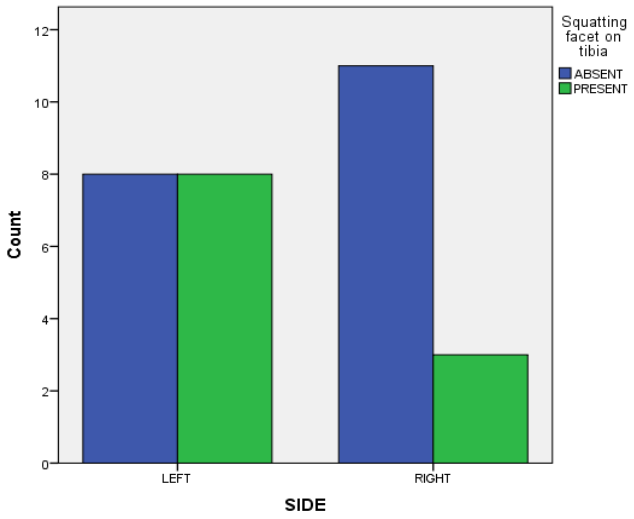
Graph No.1: Squatting facets on each side in dry talus. X-axis: side (green) against total (blue). Y-axis: count

Squatting facets are present in thirty percent irrespective of the side.
On the right side, it is present in twenty percent of the bones.
On the left side, it is present in forty percent of the bones.

3.2 Squatting Facets in Dry Tibia Bones

Table 3

Side	Absent	Present
Left	50.00%	50.00%
Right	78.60%	21.40%



Graph 2: Squatting facet in each side in dry tibia. X-axis: side (green) against total (blue). Y-axis: count.

Irrespective of the side to which the bone belongs, the percentage of presence of squatting facets is 36.66 percent.
On the right side, it is present in 21.4 percent of the bones.
On the left side, it is present in 50 percent of the bones.

4. Discussion

4.1 Squatting Facets on Dry Talus:

Irrespective of the side to which the bone belongs, the squatting facets is present in 30 percent.
On the right side, it is present in 40 percent.
On the left side, it is present in 20 percent.
It is present more on the right side.
It might be because of the natural dominance.

Inderbir Singh[2] in 1959 conducted a study of Squatting facets on the talus and tibia in Indians. Using 200 tibia and 200 tali (dry bones), 92 tibia and 100 talus (wet cartilage covered bones). The author mentioned that, out of 292 tibia which were studied, 231 tibia had squatting facets indicating an incidence of 79.1%. Of the 300 talus which were studied, 86 talus had squatting indicating an incidence of 28.6%.

According to Charles RH[5] on the study of influence of function as exemplified on the morphology of the lower extremity of Punjabi, 34 out of 53 talus was found to have squatting facets showing an incidence of 63 percent. The observation in my studies is not in agreement with the other studies. It may be because of the difference in population chosen for the study. The study was conducted on south west coast Indians and the other study was based on north Indians. Also there is a decline when compared to the Indian studies which is conclusive of the fact that there is an evident change in the life style activities.

Baykara et al. [3] conducted a study to learn the daily activities of the medieval societies in the Van region through studying of squatting facets. Adult skeletons from Dilkaya and Van Kalesi-Eski Vanehri societies dating to the Medieval Age were investigated (65 tibia and 82 tali from Dilkaya, 61 tibia and 52 tali from Van Kalesi-Eski Vanehri). The squatting facet had high ratios in both societies. The tibial squatting facet found on females and males of Dilkaya was 97.2% and 96.9%, respectively, and on females and males of Van kalesi Eski Vanehri was 87.5% and 89.2 %, respectively. The talus squatting facet found on females and males of Dilkaya was 72.1% and 51.3%, respectively, and on females and males of Van kalesi Eski Vanehri was 91.2% and 83.7%, respectively. It is evident that it is found more in females than in males. The study is not in agreement with that Baykara et al.[3] Multiple factors may contribute for the formation of squatting facets. And this difference may be because of study in different population, or difference in life style. According to Ari et al.[4] Different factors can play a role in the modifications of the distal tibia surface, articulating with the talus.

4.2 Squatting Facets on Dry Tibia

Irrespective of the side to which the bone belongs, squatting facets is found in 36.66 percent.
On the right side, it is present in 21.4 percent.
On the left side, is present in 50 percent.
The squatting facets are present more on the left side.

Inderbir Singh[9] in 1959 conducted a study of Squatting facets on the talus and tibia in Indians. Using 200 tibia and 200 tali (dry bones), 92 tibia and 100 talus (wet cartilage covered bones). The author mentioned that, out of 292 tibia which were studied, 231 tibia had squatting facets indicating an incidence of 79.1%. Of the 300 talus which were studied, 86 talus had squatting indicating an incidence of 28.6%. The observation in my studies is not in agreement with the other study when compared. It may be because of the difference in

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population chosen for the study. The study was conducted on south west coast Indians and the other study was based on north Indians. According to the study of Ari et al.[4] they investigated 125 tibia from adult male skeletons from the late Byzantine period (13th century) to observe the presence or absence of squatting facets. Thirty-one talus pairing tibia bones were also investigated concerning their relationship with the squatting facets of these bones. There recorded that 64 right (51.2%) and 61 left (48.8%) tibia and squatting facets were observed on 30 right (46.9%) and 30 left (49.2%) tibia. Among the 25 paired tibia investigated, squatting facets were seen on 9 (36%) pairs and they found was no evidence of side predilection. On the right side, squatting facets occurred on 3 (20%) tibia-talus; on the left side they were present on 7 (43.7%) tibia-talus, and only one tibia had the squatting facet and talus had none. They concluded that different factors can play a role in the modifications of the distal tibia surface, articulating with the talus. According to a study of Baykara et al.[3] to learn the daily activities of the medieval societies in the Van region through studying of squatting facets. Adult skeletons from Dilkaya and Van Kalesi-Eski Van ehri societies dating to the Medieval Age were investigated (65 tibia and 82 tali from Dilkaya, 61 tibia and 52 tali from Van Kalesi-Eski Vanehri). The squatting facet had high ratios in both societies. The tibial squatting facet found on females and males of Dilkaya was 97.2% and 96.9%, respectively, and on females and males of Van kalesi Eski Vanehri was 87.5% and 89.2 %, respectively. The talus squatting facet found on females and males of Dilkaya was 72.1% and 51.3%, respectively, and on females and males of Van kalesi Eski Vanehri was 91.2% and 83.7%, respectively. The study is not in agreement with the other study. Multiple factors may contribute for the formation of squatting facets. And this difference may be because of study in different population, or difference in life style.

5. Conclusion

Squatting Facets on dry talus bones: The percentage of presence of squatting facets is 30 percent. It is present more on the right side.

Squatting facets on dry tibia: The percentage of presence of squatting facets is 36.66 percent. The squatting facets are present more on the left side. The study is not in agreement with the other study. Multiple factors may contribute for the formation of squatting facets. And this difference may be because of study in different population, or difference in life style. Also there is a decline when compared to the Indian studies[2,5] which is conclusive of the fact that there is an evident change in the life style activities. The study forms a base for further studies in the field of evolution and effects of life style modifications on the basic human Anatomy.

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