



## Morphometric Measures of Talus Bone in Skeleton Remains Belonging to Anatolian Geography

## KEYWORDS

Talus, morphometry, Anatolia, anatomy

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**ABSTRACT** Abstract Morphometric properties of a bone structure enable the researchers to calculate all measures of a bone using a piece of it. The present study aims to evaluate all bone measures from the remains of talus bone. In our study, 40 talus bones existing in Cumhuriyet University, Faculty of Medicine, Anatomy Department Laboratory and belonging to Anatolian Geography (20 right-20 left) were evaluated. 10 measures of talus bone were evaluated and the differences between right and left were determined. Talar width (Tw) and head-neck length (Hnl) measures of left taluses are significantly higher than the right taluses ( $P < 0.05$ ). While right Tw is mean 40.7mm, left Tw is mean 43.3mm. The present study in which morphometric measures of talus bone, one of the durable bones of human body, are evaluated shall contribute to anatomic literature, anthropologic studies and forensic science.

## INTRODUCTION

The studies focusing on determination of human skeleton remains are continuing increasingly. These studies can be morphologic or morphometric. Age, gender, race and stature surveys on the bones set light to forensic science and anthropologic studies.

Measures of head, pelvis and long bones are used to evaluate population, gender and age. However, it may also be required to use other bones in the researches using bone pieces instead of the entire bone. Surface burials and poor protection lead to losses which prevent researches on skeleton material. Differently from head, pelvis and long bones, talus is protected better and its measures change less (1). During the researches to be made on skeleton material after death, talus provides the convenient conditions for osteologic analysis (2).

Talus is considered as one of the durable bones of a foot (3). Therefore, talus studies are performed by the researchers in the field of anatomy, forensic science and anthropology (4-7).

## MATERIAL AND METHOD

The talus bones used in this study were provided from the bone collection in Cumhuriyet University, Faculty of Medicine, Anatomy Department Laboratory. In our study, 40 talus bones (20 right-20 left) belonging to Anatolia region and protected well were used. In order to use in our study, 10 morphologic measures which are frequently used in literature were determined; Talar length (TL), talar width (Tw), talar height (Th), trochlear length (Trl), trochlear breadth (Trb), head-neck length (Hnl), head height (Hh), length of the posterior articular surface (Lpas), breadth of the posterior articular surface (Bpas) and talar sulcus width (Tsw) (Figure 1). head Sliding caliper with 0.1 mm accuracy was used for the measurements. Statistical analysis and right-left difference of the measures were determined. In statistical analysis, SPSS (version 14) was used.

Table1. Morphometric measurement values of talus bone

Parameter	Side	N	Mean	SD	SEM
TL	R	20	55.94	3.07	0.68
	L	20	56.54	3.65	0.81
Tw*	R	20	40.79	4.74	1.06
	L	20	43.39	2.87	0.64
Hnl*	R	20	20.81	2.40	0.53

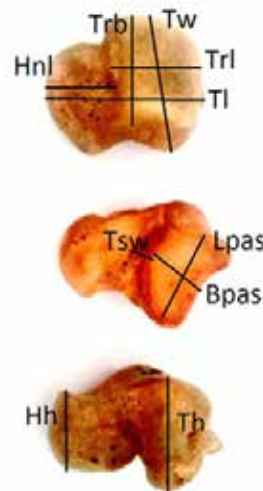


Figure1. Measurement points of talus bone

## RESULTS

Morphologic measurements and right-left differences of talus bone were analyzed statistically. Except for Hh and Tsw measures, left talus measures are bigger than right talus measures. Among these measurements, only left Tw and Hnl measures are statistically significant when compared to right measurements ( $P < 0.05$ ). The differences in other measurements are statistically insignificant (Table 1).

	L	20	22.31	2.28	0.51
Th	R	20	31.49	2.08	0.46
	L	20	32.15	2.34	0.52
Hh	R	20	27.63	2.29	0.51
	L	20	26.36	3.04	0.68
Trl	R	20	33.45	2.71	0.60
	L	20	34.12	3.22	0.72
Trb	R	20	31.69	2.05	0.45
	L	20	31.72	3.67	0.82
Lpas	R	20	31.41	2.28	0.51
	L	20	31.83	2.16	0.48
Bpas	R	20	20.95	1.57	0.35
	L	20	21.08	2.25	0.50
Tsw	R	20	6.83	2.30	0.51
	L	20	6.05	1.88	0.42

\*Differences between right (R) and left (L) talus;  $P < 0.05$ . Talar length (Tl), talar width (Tw), talar height (Th), trochlear length (Trl), trochlear breadth (Trb), head-neck length (Hnl), head height (Hh), length of the posterior articular surface (Lpas), breadth of the posterior articular surface (Bpas) and talar sulcus width (Tsw).

## DISCUSSION

Talus is a bone which is used to determine unknown skeleton remains during archaeological and forensic science excavations due to its durability (4).

In our study, when right-left difference of talus measures is compared, we determine that there were no significant differences between measures except for Tw and Hnl. It is stated that there is no right-left difference except for talar sulcus width in the studies of talus bone performed on skeleton remains belonging to 13<sup>th</sup> Century Byzantine period (7). Again,

in the studies on talus measures belonging to Hind population, it is emphasized that there is no difference between right and left in all evaluated measurements (8). It is seen that literature studies are supporting the results of our study. It can be said that there is limited or no difference between right and left in the samples of various periods and populations in the studies on talus bone.

The researchers calculated other measures or bone length of the bone using a piece of bone. As an example, they determined the relationship of humerus length with the depth and width of intertubercular sulcus (9). Furthermore, they calculated the length using other measures of the bone (8). They made studies to estimate adult human body height from talus (10). The among skeleton remains belonging to Anatolian geography shall contribute archaeological, anthropological and forensic studies to be performed in this region.

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