ORIGINAL RESEARCH PAPER

Volume-8 | Issue-4 | April-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

MORPHOMETRIC RELATIONSHIP BETWEEN HEIGHT, WIDTH AND SHAPES OF OBTURATOR FORAMEN OF DRY HUMAN HIP BONE IN WEST REGION OF UTTAR PRADESH INDIA

Anatomy

Hemant Ashish Harode — Assistant Professor, Department of Anatomy, Zydus Medical College & Hospital, Dahod - 389151

Raj Kumar* — Assistant Professor, Department of Anatomy, Zydus Medical College & Hospital, Dahod - 389151 *Corresponding Author

Karan Gopalbhai Shah — Senior Manager – Human Resource Zydus Medical College & Hospital, Dahod -389151

ABSTRACT

Obturator foramen is large opening present in the hip bone below to the acetabulum the opening is very useful to surgeon for approaching a urinary bladder & pelvic viscera while surgery, the study is conducted on 154 human dry hip bone. The mean ±S.D value of Width, Height & Shapes of obturator foramen were 43.47 ± 4.89mm, 32.90 ± 3.98mm & 34.42% oval, 65.58% triangular Shape respectively. The parameter was taken the study is significant & providing reliable knowledge to the clinicians.

KEYWORDS

Obturator foramen, Hip Bone, Slide Vernier Caliper, Scale

INTRODUCTION:

The hip bone is an irregular bone made up of three components, the ilium, pubis and ischium, which are united to each other at the acetabulum[2]. The obturator foramen is a large gap in the hip-bone, lying below and in front of the acetabulum and placed between the pubis and the ischium. It is bounded above by the grooved obturator surface of the superior ramus of the pubis; medially by the body and inferior ramus of the pubis; below by the ramus of the ischium; and laterally by the anterior border of the body of the ischium including the margin of the acetabular notch. A fibrous sheet, termed the obturator membrane, which is attached to its margins. The free upper edge of the membrane is attached in front to the anterior obturator tubercle, which marks the anterior end of the inferior border of the superior ramus of the pubis and behind to the posterior obturator tubercle, which is placed on the anterior border of the acetabular notch. These tubercles are not always easy to identify[1].

The obturator foramen bounded by the pubis and ischium and their rami. Except for a small passageway for the obturator nerve and vessels (the obturator canal), the obturator foramen is closed by the thin, strong obturator membrane. The presence of the foramen minimizes bony mass (weight) while its closure by the obturator membrane still provides extensive surface area on both sides for fleshy muscle attachment[7]. In 1891, Matthew and Billings first attempted to use measurements and indices to determine or confirm the sex of pelvises, as mentioned by Hoyme[4].

Mean values of various parameters from different regions show significantly different values and therefore demarking point (DP) has to be calculated separately for different regions[5]. Out of the three components of hip bone, the ilium has more changes as required for different modes of locomotion, to provide more advantageous leverage for the muscles concerned in locomotion & for stability for weight bearing[6].

The shape of obturator foramen presents below and slightly anterior to the acetabulum was noted in both the sexes. The shape of obturator foramen was oval in male and triangular in female[3].

MATERIAL & METHODS

The present study consists of Unknown sex of 154 dry human hip bone. All bones are free from any pathological or congenital anomalies & its fully ossified. These bones were obtained from various medical colleges: Teerthanker Mahaveer Medical college & Research Centre, Moradabad (U.P), Chhatrapati Shahu ji Maharaj Medical College, Lucknow, Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly. Measurements were taken from Vernier calipers, the Height, Width & Shapes of obturator foramen were observed. In this study 5% significance level and various levels of significance are considered. Correlation between morphometrical parameters were investigated using z-test, $p<0.0001$ was significant level.

The measurements were done on intact parts of normal bones. Bones showing wear and tear, fracture or any pathology were not considered. Each linear recording was taken to the nearest millimeter.

Measurements for all the above indices were taken as per the norms described in anthropometry. The data obtained for all parameters were analyzed statistically to find range, z-test, mean and standard deviation (S.D.). Each variable was measured 2 times at 2 different sessions by the same observer and the mean value of the 2 measurements was calculated for each variable of each bone for the measurements of these variables a scale.

Size of the Obturator foramen: -

The diameter is taken from the inner margin of the foramen through Vernier caliper where maximum height achieves vertically in anatomical position the width is achieved by maximum transverse diameter & shown in figure no 1 & 2.

Shape of the Obturator foramen: -

It was careful observation that oval & triangular shape foramen found which shown in figure no 3 & 4.

RESULT

The mean ±S.D value of Width and Height of obturator foramen were 43.47 ± 4.89mm, 32.90 ± 3.98mm & 34.42% oval, 65.58% triangular Shape respetively. Positive and significant correlation was found between the width and height of the obturator foramen (r=0.42).

DISCUSSION

The mean ±S.D value of Width and Height of obturator foramen were 43.47 ± 4.89mm, 32.90 ± 3.98mm & 34.42% oval, 65.58% triangular Shape respetively. The maximum and minimum measurements of obturator foramen width were 41.0 mm, 25.0mm and maximum and minimum measurements of obturator foramen height were 56.0mm,31.0 mm respectively. Positive and significant correlation was found between the width and height of the obturator foramen (r=0.42).

Distribution of anatomical parameters of hip bone and unknown sex related differences within various ethnic parameters are presented in Table. Statistical software namely **SPPS** 21 was used for analysis of data. Microsoft word and Excel have been used to generate graphs, tables, etc. Hip bone parameters unknown sex one- sample Z-test, correlation variance.

Summarizes the means and standard deviations of width and height of obturator foramen of the hip bone. The result showing in table no 1

Analysis	Height	Width	Shapes Obturator Foramen (154)	Oval Shape	Triangular Shape
Mean	43.47	32.90			
Standard deviation	4.89	3.89		53 (34.42%)	101(65.58%)
z-test	-110.3167	-102.5825			
P value	< 0.0001	< 0.0001			

Table no 1

The fact that the obturator foramen is correlated with height may have implications for urologist & gynaecologist. Trans-obturator vaginal tap inside-out is a minimally invasive treatment of stress urinary Incontinence.Study has not done previously, and no reference is available in books as well as existing journals. This study was also undertaken to add new dimensions to hip bone, hitherto not worked anywhere. Although it may be of significance for future studies in this field. The present study has giving milestone knowledge to the researcher for various advance as well as modern medical sciences approach.

Figure no 1 Showing width of the obturator Foramen.

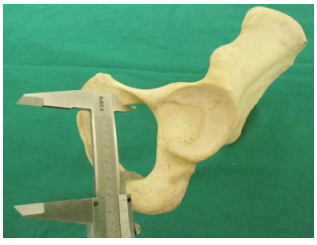

Figure no 2 Showing height of the obturator Foramen.

Figure no. 3 showing oval shape of Obturator Foramen

Figure no. 4 showing triangular shape of Obturator Foramen

REFERENCES

1. Willams PL.,Bannister LH,Martin MM Collins,P., Dyson,M. and Dussek, JE.MWJ, Gray's Anatomy(39ed.) Churchill Livigstone, London, pp-1421-1427.
2. Standring's. Gray's Anatomy. 40thEd, Edinburgh. Elsevier Churchill Livingstone Publishers; 2008.p, 1379-1380.
3. Bollavaram Pullanna, Bindhu S, Ramakrishna Avadhani, Meera Jacob. morphometry of the adult human dry hip bone in south Indian population Int J Anat Res 2019, Vol 7(1.2):6178-82.
4. Bernbeck R. Vergleichend-anatomische Untersuchungen zum problem des aufrechten Ganges und des spezifischen Geburtsmechanismus beim Menschen. Naturw. Diss. (cited from Martin, R. and Saller, K.: Lehrebuch der Anthropologie. 1952, 556. Gustav Fischer Verlag, Stuttgart, 1957.
5. Kishor Dattatray Khushale et al. Indian Journal of Clinical Anatomy and Physiology. 2016; 3(4):518-525.
6. Kanika Sachdeva et al. Role of ilium in sexual dimorphism of hip bone: a morphometric study in north Indian population, Int J Anat Res. 2014; 2(3):524-32.
7. Moore, Keith L.; Dalley, Arthur F.Clinically Oriented Anatomy, 5th Edition P-563