ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com
Journal DOI: 10.21474/IJAR01

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

MORPHOLOGICAL VARIATION OF FORAMEN MAGNUM.

***R.YASODAI[1], DR. SHIVAKUMAR A.H[2], ,DR.S.RAJASHANKAR[3] and M.VEERAMUTHU[4].**

1. Lecturer, Dept.of human anatomy, JKK Nataraja Dental College, Komarapalayam, Nammakal district, Tamilnadu, India.
2. Professor and hod, Davanagere, Karnataka.
3. Professor, Dept of human anatomy, Velammal Medical College.
4. Tutor, Dhanalakshmisrinivasan Medical College, siruvachur, perambalur.

Manuscript Info

Manuscript History:

Received: 15 April 2016
Final Accepted: 29 May 2016
Published Online: June 2016

Key words:
FM-foramen magnum,AP-anteroposterior,TP-transverse process.

Corresponding Author

R. YASODAI.

Abstract

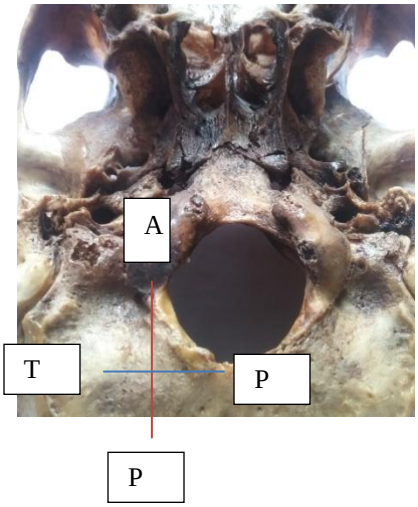
Aim:- To study the foramen magnum size, shapesvariations in the dryskulls.
Materials and method:- The morphological diameter variation distance taken from
i)Antero posterior/sagittal diameter
ii)Transverse diameter of foramen magnum from completely ossified unknown ages of male, female250 skulls of
south India,Tamilnadu,Nammakal district dental collegeswith the help of Vernier caliper
Result and conclusion:- According to our study foramen magnum shows shape variationslike rhomboid,hexagonal,pentagonal, oval,irregular and spherical.It is very useful to identify the sexdifference and also with the clinical intervention by the meandiameter of longitudinaltransverse diameter of foramen magnum.

Introduction:-

Foramen magnum provides thecommunication between the cranium and vertebral column. The knowledge of FM diameter is very important to the surgeons, anthropological and forensic medicine.In this study we find out the variation of foramen magnum of theskull. Many studies focused on the Occipital condyles and foramen magnum. Morphometric analysis highlighting their clinical, orthopedic, neurosurgical and forensic importance . Pathological FM dimensions, as in achondroplasia and brain herniation cases can result in compression of the vital structures passing through it and can influence the flow of blood and CSF. In the present study, the FM were classified according to their shape; their anatomic matric values were evaluated. The morphological abnormalities in the region were reported and possible correlations between the parameters studied, were investigated, as an orientation point in cases requiringcraniocervical surgery.

Materials and method:-

The morphological diameter variation distance taken as follows(diagram)



i)Antero posterior/sagittal diameter(the distance from basion to opisthion)
ii) Transverse diameter of foramen magnum (the distance between the lateral margins of the FM at the point of greatest lateral curvature)
iii) shape of foramen magnum

From completely ossified unknown ages of male, female 150 skulls of South India,Tamilnadu,Nammakal district Dental colleges with the help of vernier caliper. The different shapes of foramen magnum like round, oval, egg, irregular, pentagonal,hexagonal were measured.The area of the foramen magnum was calculated by using theformulae1/4*3.14*FML*FMW. Foramen magnum index was calculated by width*100/foramen magnum.

Results:-

Round

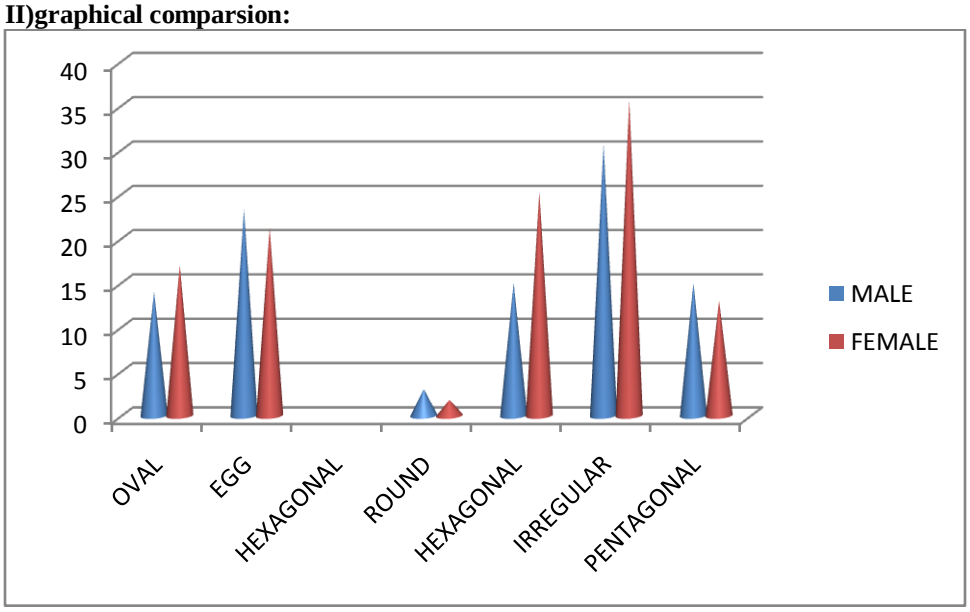
Pentagonal

Egg

I)comparsion of male and female fm skull

SHAPES	MALE	FEMALE
OVAL	14	17
EGG	23.3	21.2
ROUND	3	1.8
HEXAGONAL	15	25.3
IRREGULAR	30.7	35.7
PENTAGONAL	15	13

II)graphical comparsion:



II)Mean value of foramen magnum AP and TP diameter of both sex

Gender	Ap diameter	Tpdiamete	P value
Male	30.3	22.2	>0.006
Female	25.6	20.8	>0.001

III) Index of foramen magnum area with other articles

Authors	FM area(mm2)	FM index
Present study	913.07	85.66
Gunay et all	909.91	-
Burden et al	874.4	89.34

Discussion and conculsion:-

In our study the result ofFM of the skulls shows,antero posterior and transverse diameter maximum and minimum values were noted respectively. Normally.the foramen magum is oval shape, but in our study shows different shapes,variation of foramen magnum. In the presentstudy reported that, the male skulls shows more variation with the help of mean values as well asantero posterior diameter and transverse diameter of the female skulls of FM.

Result shows that, the FM was identified in the male skulls shown irregular and egg shape compared to the female skulls comparsion with AP and TP and also with p value>o.oo6 in males. It is very important and useful for the clinical intervention because, the vital structures passing through it.According to

i)SINDEL et al observed that the foramen magnum shape is oval at18.9%

ii) MURSHED ET A found OVAL FM at 8.1%,PENTAGONAL FM 14.6%,HEXAGONAL FM at14.6%.

iii)Acording to ZAIDAI AND DAYAL REPORTED that HEXAGONAL FM at 24.5,pentagonal FM at 7.5%,irregular FM at18%,hexagonal FM at 8%.

Reference:-

1. Murshed KA, Cicekcibasi AE, Tuncer I. Morphometric evaluation of the foramen magnum and variations in its shape:A study on computerised tomographic images of normal adults.Turk J Med Sci. 2003;33:301-306.
2. RadianskyL.Relative brain size a new measure. Science. 1967;155:836-838.
3. Zaidi S H, DayalS S. Variations in the shape of the foramen magnum in Indian skulls. AnatAnz Jena. 1988;167:338-340.[22].
4. Barut N, kale A, TuranSuslu H, Ozturk A, Bozbuga M, Sahinoglu K: Evaluation of the bony landmarks in trans condylar approach. Br J Neurosurg. 2009;23:276-281.
5. K. Edward, M.D. Viner, W. Schweitzer, M.J.Thali. Sex determination from the foramen magnum. Journal of forensic radiology and imaging.2013;1(4):186- 192.Radhakrishna SK, Shivarama CH, Ramakrishna A, Bhagya B (2012)
6. Morphometric analysis of foramen magnum for sex determination in South Indian population. NUJHS 2:20–22
7. Avci E, Dagtekin A, Ozturk AH, Kara E, Ozturk NC, Uluc K, Acture E, Baskaya MK (2011) Anatomical variations of the foramen magnum, occipital condyle and jugular tubercle. Turk Neurosurg 21:181–190 3. Babu RP, Sekhar LN, Wright DC (1994)
8. Extreme lateral trans- condylar approach: technical improvements and lessons learned. J Neurosurg 81:49–59 4. Barut N, Kale A, Suslu HT, Ozturk A, Bozbuga M, Sahinoglu K (2009)
9. Evaluation of the bony landmarks in transcondylar approach. Br J Neurosurg 23:276–281 5. Berge JK, Bergman RA (2001)
10. Variations in size and in sym- metry of foramina of the human skull. ClinAnat 14:406–413
11. Boulton MR, Cusimano MD (2003) Foramen magnum menin- giomas: concepts, classifications and nuances. Neurosurg Focus 14:10.