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Original Research Paper

Anatomy

THE INCA BONE: A RARE ANATOMICAL OCCURRENCE WITH COMPETENT CLINICAL SIGNIFICANCE.

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ABSTRACT Background: Anatomical variation is a presentation of body structure with morphological features different from those present in majority of individuals which are categorized into 3 types: morphometric (size/shape), consistency (present/absent), spatial (proximal/distal/right/left). These variations can be considered normal when found consistently, without symptoms in different individuals & termed anatomical variations rather than abnormalities. This study is conducted to estimate occurrence of Inca bones, their location across inter-parietal & lambdoid suture and their clinical significance which can be a guiding tool for patient care. The present study was conducted for the presence of Inca bone on 40 human dried skull & skull vault of unknown age and sex in the Department of anatomy, Baroda Medical College, Gujarat. After thorough & careful examination, various parameters like presence, absence, symmetry, asymmetry, position and number of Inca bone were identified, data was collected and analyzed. The present study revealed high incidence of Inca bones. Lambdoid suture shows maximum numbers of Inca bones in comparison to inter-parietal suture. Presence of Inca bones can lead to misinterpretations of clinical diagnosis and their knowledge will be helpful to clinicians and surgeons to reduce the error in diagnosis & it will strengthen the patient care.

KEYWORDS : Clinical Significance, Inca bone, Knowledge, Patient care

INTRODUCTION:

Anatomical variation is a presentation of body structure with morphological features different from those present in majority of individuals. Usually such variations are categorized into 3 types as follows: Morphometric (size/shape), Consistency (present/absent), Spatial proximal / distal / right /left). These variations can be considered normal when found uniformly, without symptoms in different individuals. Such uniformities are termed anatomical variations rather than abnormalities. Various names are reported for inca bones e.g. Flowers bone, Supernumerary bone, Wormian bone, Sutural bone. These bones are usually found in lambdoid and parietal suture[1]. Additional ossification centers may occur in or near sutures, giving rise to isolated sutural bones. The neurocranial bones of variable size and shape are often encountered at the fontanellae or along the sutures[2].

Inca bones are irregular size and shape and they also occur at fontanelles, especially the posterior fontanelle. They are clinically important markers for many syndromes and therefore useful in diagnosing, Osteogenic imperfecta, Rickets, Kinky-hair"menke's syndrome, Otopalatodigtal syndrome, Cleidocranial dysostosis, Hypoparathyroidism, Hypo-phosphatasia, Down's syndrome. So the knowledge of inca is enlightening for the neuroanatomists, neurosurgeons, orthopedicians, radiologists, anthropologists and morphologists[3].

MATERIAL AND METHOD:

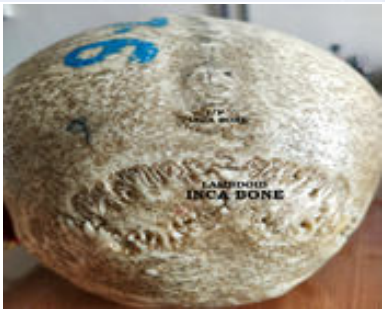
The present study was conducted on inca bone in human dry skull at Department of Anatomy, Medical College, Baroda,Gujarat. 40 human dried skull of unknown age and sex without gross deformity in parietal and lambdoid suture were selected for study. After thorough & careful examination, various parameters like presence, absence, symmetry, asymmetry, position(right &left) and number of Inca bone were identified on lambdoid and parietal sutures. A bony specule which was covered by well defined sutural boundaries was considered as inca bone.

The data was collected, tabulated and analyzed with the Microsoft excel.

RESULT AND DISCUSSIONS:

Table 1: Showing Presence Of Inca Bone In Lambdoid And Inter-parietal Suture:

Parameter	No of Specimen (n=40)	Percentage
Inter-parietal	3	7.5%
Lambdoid	20	50%



Lambdoid suture shows maximum numbers of Inca bones as compare to parietal or sagittal suture. Similar observations were reported by Murlimanju et al and Shivaleela et al in their study which was 56% and 34% respectively[3,4]

Table: 2 - Bilateral Asymmetry

Parameter	No Of Specimen (n=40)	Percentage
Total Asymmetry	17	42.5%
Right asymmetry	14	35%
Left Asymmetry	16	40%

In present study, total asymmetry observed was 42.5% out of which right asymmetry accounts for 35% and left asymmetry accounts for 40% which was supported by similar findings by bergman at el and kumar et al in their study[5,6].

Table: 3 – Bilateral Symmetry

Parameter	No Of Specimen(n=40)	Percentage
Bilateral Symmetry	8	20%

In present study, bilateral symmetry was observed in lesser percentage which was 20%. Similar findings were reported by Natsis et al and Rao et al in their study[7,8].

CONCLUSION:

The incidence of inca bone helpful to anatomist, radiologists, anthropologists, orthopedic surgeons, forensic experts, pediatricians and interventionist in their day to day practice. Study of inca bone signifies that multiple bones have cranial and skeletal disorder and also mimic as skull fracture. This will guide neurosurgeon for making proper diagnosis and for planning of surgery.

Presence of Inca bones can lead to misinterpretations of clinical diagnosis that is why it's knowledge will be helpful to clinicians and surgeons to reduce the error in diagnosis & thereby it will strengthen the patient care which shows their keenness to disseminate information about this life saving event which ultimately will contribute to heath care system and definitely help mankind.

Limitation Of Study: The samples size is smaller. So to generalized the results, study shall be conducted on large sample size.

Conflict Of Interest: Nil
Source Of Funding: Nil

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