



## STUDY ON INCIDENCE OF INCA BONE IN DRY HUMAN SKULLS

## Anatomy

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## ABSTRACT

**Introduction:** Inca bones, also referred to as interparietal or supernumerary bones, are rare anatomical variations located in the occipitoparietal region of the skull. Their prevalence varies worldwide, ranging from 0.5% to 15%, and they hold significance in forensic medicine, radiology, and anthropology due to their potential to be misidentified as cranial fractures. This study aims to determine the prevalence of Inca bones in dry human skulls from Udaipur, Rajasthan. **Materials And Methods:** This osteological study was conducted on 60 dry human skulls from the Department of Anatomy at RNT Medical College, Udaipur, collected over six months (January to June 2024). The skulls were examined for the presence of Inca bones. Sex was identified based on external features such as the supraorbital ridge and mandible angle. The skulls were examined macroscopically, and those with Inca bones were photographed. **Results:** Of the 60 skulls, a complete tripartite Inca bone was found in 2.7% of male skulls, and a lateral asymmetric Inca bone was observed in 4.34% of female skulls. The overall prevalence of Inca bones in the Udaipur population was 3.33%. **Conclusion:** The study identified a lower prevalence of Inca bones compared to some Indian populations. These findings underscore the importance of recognizing Inca bones in forensic and radiological assessments to avoid misinterpretation as cranial fractures. Future studies with larger sample sizes are recommended to explore the clinical significance of these variations in the Udaipur population.

## KEYWORDS

Inca bone, Human skull, Accessory bone

## INTRODUCTION

Inca bones, also known as interparietal or supernumerary bones, are rare anatomical variations found in human skulls. These additional bones, typically located in the occipitoparietal region, have been observed in various populations worldwide, with reported frequencies ranging from 0.5% to 15% [1, 2]. The presence of Inca bones is of significant interest in forensic medicine, radiology, and anthropology, as they can be mistaken for skull fractures or other cranial abnormalities [3, 4].

Inca bones have been extensively studied in ancient Peruvian mummies, where they were found to be more prevalent [5]. However, data on their incidence in contemporary Indian populations is limited. Previous studies have reported varying frequencies of Inca bones in Indian populations, ranging from 2.4% in North Indian skulls [6] to 4.8% in South Indian skulls [7].

The Udaipur population, with its unique genetic and demographic characteristics, presents an opportunity to investigate the prevalence of Inca bones in a previously understudied group. Understanding the incidence of Inca bones in this population can provide valuable insights into the anatomical variations prevalent in this region.

Furthermore, knowledge of Inca bones is essential for forensic experts, radiologists, and anthropologists to accurately diagnose and interpret cranial abnormalities [8]. This study aims to determine the incidence of Inca bones among dry human skull bones of the Udaipur population, providing valuable insights into the anatomical variations prevalent in this region.

## MATERIALS AND METHODS

This osteological study was done on 60 dry human skulls irrespective of age during a six-month period from January 2024 to June 2024. The

study sample bones were taken according to convenient sampling method. Ethical committee clearance was obtained prior to the study. The skulls were collected from Department of Anatomy, RNT medical college, Udaipur(Rajasthan). The sex of the bones were identified using external features such as supraorbital ridge, shape of forehead, angle of mandible etc.

**Inclusion Criteria:** The skulls of which were normal without any fracture or damage were included in the study.

**Exclusion Criteria:** Skulls with visible deformities were excluded from the study.

The skull bones were macroscopically examined for the presence of inca bones. The photographs were taken for the skull bones with inca bones.

## RESULTS

Among 60 dry human skull studied, 37 is of males and 23 of females. One complete tripartite inca bone found among male skulls.



Figure 1: Complete Tripartite Inca Bone



occipital bone in man. J Anat. 1977;124:643-49.

**Figure 2:** Lateral Asymmetric Inca Bone

(2.7%) and One lateral asymmetric inca bone found among females (4.34%). Overall prevalence of inca bone was found to be 3.33%.

**DISCUSSION**

The present study aimed to investigate the incidence of Inca bones among dry human skull bones of the Udaipur population. Our results show that the overall prevalence of Inca bones was 3.33%, which is lower than previously reported frequencies in some Indian populations [1, 2], but comparable to others [3].

The study found a complete tripartite Inca bone in 2.7% of male skulls, which is consistent with previous reports of Inca bones being more common in males [4]. However, the lateral asymmetric Inca bone found in 4.34% of female skulls is a notable finding, suggesting that Inca bones may not be exclusively associated with males.

Comparing our results with existing literature, the prevalence of Inca bones in our study is lower than the 4.8% reported in South Indian skulls [2], similar to the 3.5% reported in North Indian skulls [1] and higher than the 2.4% reported in another North Indian study [3]

**Table 1: Table Showing Comparison Of Prevalence Of Inca Bones From Our Study With Existing Literature**

| S. No. | Study                  | No of skull studied | Prevelance of inca bone |
|--------|------------------------|---------------------|-------------------------|
| 1      | Present study          | 60                  | 3.3%                    |
| 2      | Saxena SK et al., [11] | 40                  | 2.5%                    |
| 3      | Nirmale VP [19]        | 148                 | 4.05%                   |
| 4      | Srivastava HC [18]     | 620                 | 0.8%                    |

**CONCLUSION:**

The presence of Inca bones has significant implications for forensic medicine, radiology, and anthropology [5, 6]. Accurate identification of Inca bones can aid in distinguishing between cranial abnormalities and fractures [7].

The limitations of our study include the relatively small sample size and the focus on dry human skull bones. Future studies should aim to recruit larger samples and explore the clinical significance of Inca bones in the Udaipur population.

Our study contributes to the understanding of anatomical variations in the Udaipur population, highlighting the importance of considering Inca bones in forensic and radiological evaluations.

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