Cases of interparietal bones in adult skulls

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Abstract

The squamous occipital bone consists of two parts supraoccipital and interparietal. Usually interparietal bone fuses with supraoccipital but sometimes remains as separate bone. In this study total 419 adult male & female skulls, their ages range from 17 to 39 years, were examined to determine the incidence of the interparietal bone. The interparietal bone was observed in 4 skulls (0.95%), three male skulls and one female skull

Key words: Interparietal bone, Sutural bones.

Introduction

The squamous part of occipital bone consists of supraoccipital and interparietal parts (1). Interparietal part above the highest nuchal line develops in membrane from two pairs of ossification centers (2). The first pair of centers consists of two lateral nuclei and forms two lateral plates and the second pair of centers include upper and lower nuclei and appears between two lateral plates and forms the medial plate (3). Failure of fusion between these centers of nuclei with each other or with supraoccipital part may give rise to interparietal bone(s) (4). In this study the incidence of interparietal bone in Salah-aldin region an Iraqi governorate, has been estimated and compared with other relevant literatures.

Materials and Method

A total of 419 adult cadaver skulls (293 males & 126 females), their age range from 17 to 39 years, were received from different region sectors of Salah-aldin governorate were examined at forensic medicine department by removing the scalp and the aponeurosis with all the soft tissues to uncover the skull and determine the occurrence of interparietal bone. All the specimens were free of pathological changes or anomalies

Results

Four skulls out of examined 419 skulls, in which the Interparietal bone(s) were observed, three male skulls and one female skull (0.95%)

Skull No. 1 male

A single large semi quadrilateral separate Interparietal bone was seen below lambda in skull of male aged 28 years (Fig. 1).

Skull No. 2 : male

Two large separate interparietal bones seen on left and right side below lambda in skull of male aged 39 years, each one is triangular shaped. (Fig. 2).

Skull No.3: female

A single large semi rounded incompletely separated Interparietal bone was seen below lambda in skull of female aged 32 years. The ossicles seen in the left side of lambdoid suture are sutural bones (Wormian bones), (Fig. 3).

Skull No. 4: male

Two separate interparietal bones seen on left and right sides below lambda watched in skull of male aged 28 years, each one is triangular shaped, the right side Interparietal bone is bigger than the left side (fig 4).

Discussion

Ranke (1913) described that there were two pairs of ossification centers at interparietal part above highest nuchal line (5). The interparietal bone seen in fig (1) resulted from failure of fusion between upper and lower nuclei of medial plate.

Breathnach (1965) mentioned sometimes a third pair of ossification centre (Preinterparietal) is seen in addition to two pairs of centers (6). the occurrence of the two large separate interparietal bones (fig 2), is due to failure of fusion of left medial plate with right medial plate, and left lateral plate with left medial plate, and the other interparietal bone of right side is due to

failure of fusion of right medial plate with the right lateral plate.

As Shrivastava pre-interparietal bone develops due to presence of the third pair of centers (1). In the present study (Fig 3) single large semi rounded incompletely separated interparietal bone was resulted because of failure of complete fusion between upper and lower nuclei of medial plate. The ossicles seen in the left side of lambdoid suture are sutural bones (Wormian bones), their occurrence represent failure of complete fusion between the Interparietal bone and the lateral left plate.

According to Shrivastava (3) pre-interparietal bone develops as a result of failure of fusion between upper and lower nuclei of the medial plate and is actually parts of interparietal bone. He claims that all bones developing in the region of lambda and lambdoid suture outside the limits of interparietal area are sutural or wormian bones with separate ossification centers.

The incidence of interparietal bone (Table-1) was reported as 0.8% by Shrivastava (1) 1.6% by Singh et al (9), 2.6% by Pal et al (7), 4.0% by Cireli et al (10), 2.5% by Saxena et al (11),1.6% by Maden Muftuoglu (12), 6.6% by Aycan (13),0.95% by Katkici et al(14), 0.8% by Gopinathan (15), and 0.99% by Zambare (4). In our study the incidence of interparietal bone was 0.95%.

According to Pal et al (1984) a true pre-interparietal bone is triangular in shape and found posterior to lambda. In present study they are found only in one bone (Fig. 3) whereas two triangular interparietal bones as in (Fig 2 & 4) their incidence are due to failure of fusion of left medial plate with right medial plate and left lateral plate and the other Interparietal bone of right side is due to failure of fusion of right medial plate with left medial plate and right lateral plate (3). The bone which was called as pre-interparietal in previous studies is actually part of interparietal or sutural bone. As Pal et al (7) and Pal (8) the term "Pre-interparietal" is misleading and bones should be referred as upper central piece or pieces of the interparietal bone.

The present study also suggests that the term pre-interparietal is misnomer and should not be used. Our findings in the present study are like Katkici percentage (14).

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Table (1): Incidenceof interparietal bone

Author	*Year*	*Number*	*Percentage*
Shrivastava	1977	620	0.8
Singh et al	1979	500	1.6
Pal et al	1984	348	2.6
Cireli et al	1985	150	4.0
Saxena et al	1986	40	2.5
Magden & Muftuoglu	1990	420	1.6
Gopinathan	1992	125	0.8
Aycan	1993	91	6.6
Katkici & Gumusburum	1995	302	0.95
Zambare	2001	310	0.99
Present Study	2007	419	0.95

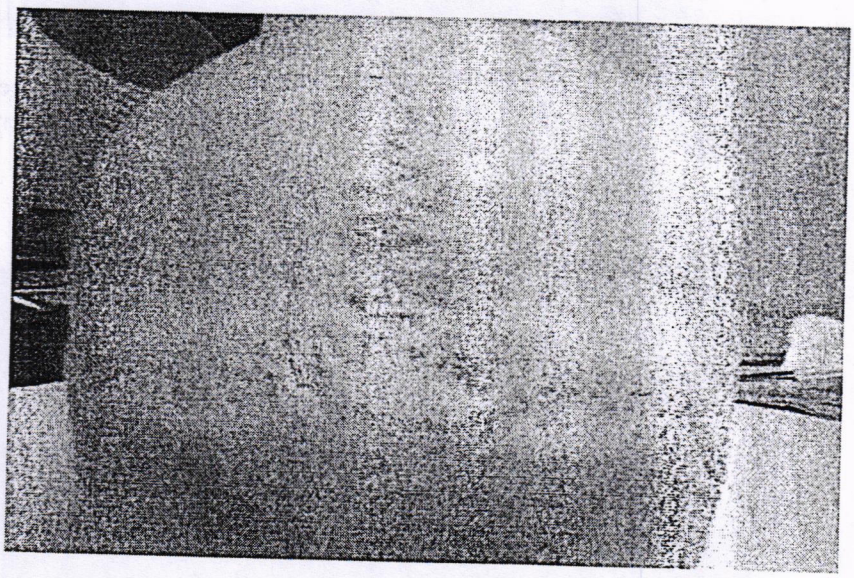

Fig. (1): A single separate and semi quadrilateral interparietal bone was seen below lambda as failure of fusion of upper nuclei of medial plate with lower nuclei.

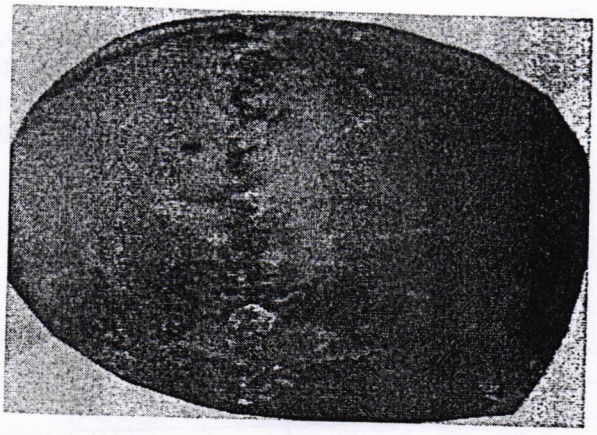

Fig (2): Large separate triangular interparietal bone seen on left side and right side below lambda.

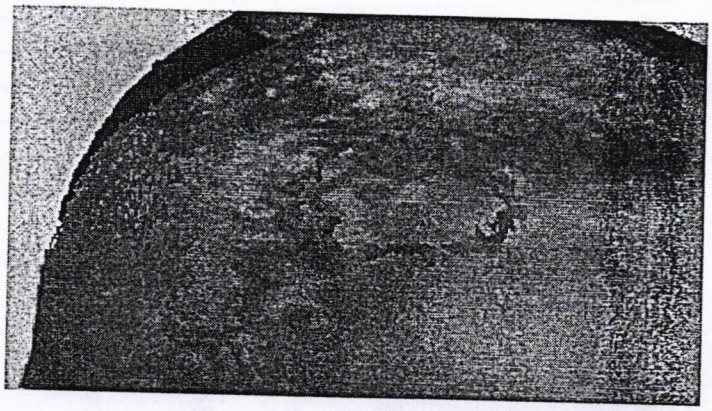

Fig (3): A single incompletely separated, semi rounded interparietal bone seen below lambda represent failure of fusion of upper nuclei of medial plate with lower nuclei.

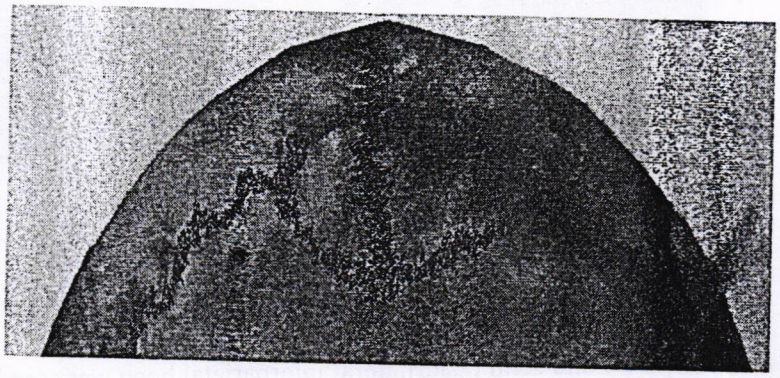

Fig (4): Below the lambda two unequal separated triangular shaped interparietal bones, the right side is bigger than the left side.