

Presence of Wormian bone at bregma and paired frontal bone in an Indian skull

Published online 14 November, 2006 © <http://www.neuroanatomy.org>

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Received 8 March 2006; accepted 8 November 2006

ABSTRACT

The occurrence of Wormian (sutural) bones in the skull is quite common. Presence of metopic suture is also known. We found a case of complete metopic suture resulting in doubling of the frontal bone in an adult Indian skull. The same skull had a large Wormian bone at the bregma. Knowledge of this variation is very important for radiologists, orthopedic and neurosurgeons. Similar case has not been reported hitherto. *Neuroanatomy*; 2006; 5: 42–43.

Key words [bregma] [frontal bone] [metopic suture] [skull] [wormian bone]

Introduction

Frontal bone is one of the unpaired bones of the skull. The bone develops in two halves and presents a metopic suture between the two in the fetal life; however, the suture disappears completely before or shortly after birth. Bregma is the meeting point of the sagittal and coronal sutures. It is represented by the anterior median fontanelle in the fetal life. The fontanelle obliterates usually by 18th postnatal month. Sutural bones or Wormian bones are common in the skull but presence of a Wormian bone at bregma has not been reported yet. We saw a large Wormian bone at bregma and a complete metopic suture in an adult skull.

Case Report

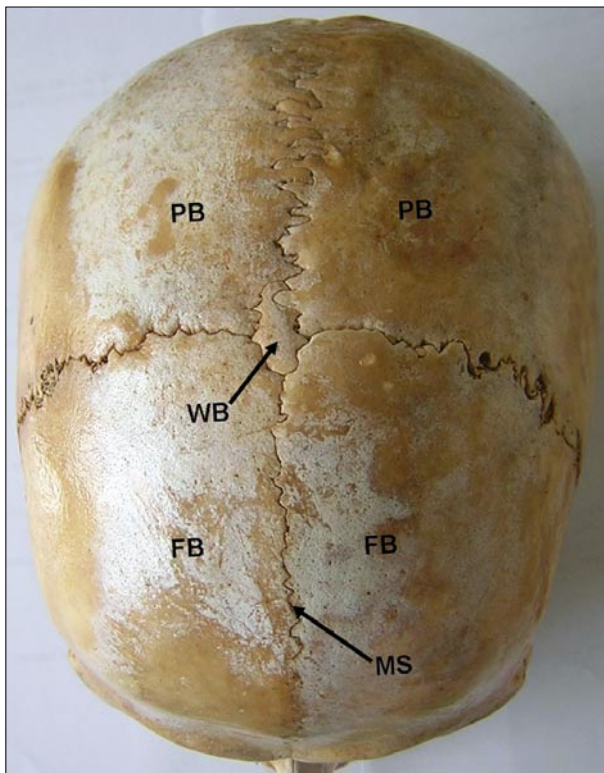
During the routing osteology demonstration class for undergraduate medical students, variations related to the frontal bone and bregma, were noted in an adult skull. The frontal bone was doubled because of the presence of a complete metopic suture. This suture was very prominent and extended from the frontonasal suture to the bregma. At the bregma, there was a large Wormian bone, which occupied the space between the two halves of the frontal bone and the two parietal bones (Figure 1). There were no other abnormalities in the skull.

Discussion

Frontal bone is an unpaired bone of the skull in adults. It ossifies in fibrous mesenchyme from two primary ossification centers appearing in the 8th week in utero,

one near each frontal tuber [1]. At birth, the bone consists of two halves, which may persist in rare cases [2, 3]. The two halves of the bone are joined in the midline by the metopic suture. The metopic suture is present at birth and is obliterated by 6–8 years. Persistence of the interfrontal or metopic suture has been reported, frequencies ranging from 1 to 12% of skulls. Metopism occurs, according to one study, in 8.7% of European Caucasians, 5.1% of Asians, 1.2% of blacks, and in only 1% of Australian Caucasians [4]. Persistence of a complete or incomplete frontal (metopic) suture may be associated with a syndrome involving several variations of the visceral cranium and the phalanges. Failure of ossification in a broad and elongated area in the region of the frontal suture has been shown to be associated with a partial or complete absence of the clavicle [4]. In a study conducted by Bilodi et al [5], metopic sutures were found in six skulls (11.46%). This study showed higher incidences of incomplete metopic sutures (7.84%). One skull showed double incomplete sutures (one to right of bregma and other in the middle of the frontal bone in the mid line), which was of, a very rare variety seen in frontal bone of (1.96%), three skulls showed incomplete sutures (3.92%).

Wormian bones (sutural bones) are also very common. According to Bergman et al [4], nearly 40% of skulls have sutural bones in the vicinity of the lambdoid suture. The next most common is the epipteris bone (pterion ossicle) found near the former anterolateral fontanelle. The occurrence of preinterparietal bone or Inca bone at



the lambda has been reported by previous workers [6-8]. Studies [7, 9, 10] have shown that the presence of sutural bones is associated with other cranial and central nervous system abnormalities.

There are no previous reports about the presence of a Wormian bone at the bregma. The persistence of the entire metopic suture, resulting in paired frontal bones makes this case unique. The presence of the sutural bone at the bregma may be because of appearance of an abnormal ossification centre in the fibrous membrane at the anterior median fontanel of fetal life. The knowledge about a bone like what we have seen here may be of importance to the radiologists, orthopedic surgeons and neurosurgeons. Since bregma is an important clinical and surgical landmark, it is worth coining a term to the sutural bone found here.

Figure 1. Superior view of the skull showing the Wormian bone at bregma and metopic suture. Color version of figure is available online. (WB: Wormian bone; PB: parietal bone; FB: frontal bone; MS: metopic suture)

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