CASE REPORT

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A Unique Case of Congenital Bilateral Absence of Parietal Bones in a Neonate

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ABSTRACT: The remains of an unidentified female neonate were discovered in a field in central Missouri. Examination revealed bilateral absence of the parietal bones. A search of the literature describing similar defects suggests that the present case represents a unique condition, described here for the first time.

KEYWORDS: pathology and biology, musculoskeletal system, parietals, congenital defects

In 1985, the mummified remains of a newborn neonate were discovered in a field in central Missouri. It was determined on the basis of the soft tissue anatomy that the remains were those of a female infant. No determination as to its ethnic affiliation was possible. X-ray examination of the remains indicated that the postcranial skeleton was unremarkable and that its age was the third trimester. Examination of the skull,[3] however, revealed the bilateral absence of the parietal bones.[4] The purpose of this paper is to describe this defect and compare it with similar defects reported in the literature.

The skull is subnormal in cranial vault volume and exhibits a total absence of both parietals (Figs. 1 through 4). In addition, the frontals are abnormal in shape. Unlike normal frontal bones, which ascend vertically from the brow ridges, the frontal bones of this specimen angle posteriorly, beginning at a point approximately 2 cm above the superior aspect of the orbits and continuing to the coronal margin (Fig. 5). This may be attributed to a lack of appositional forces acting upon the frontal bone in the absence of the parietals.

Although the occipital appears relatively normal in shape, it exhibits an open split or crack on each side in the area of the junction of the lambdoid and squamous sutures.

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[3]Because of the degree of decomposition, preparation of the skull was accomplished by soaking it in warm water and then physically removing the adhering tissue.

[4]There was no evidence of postmortem alteration of the skull that could account for the absence of the parietals.

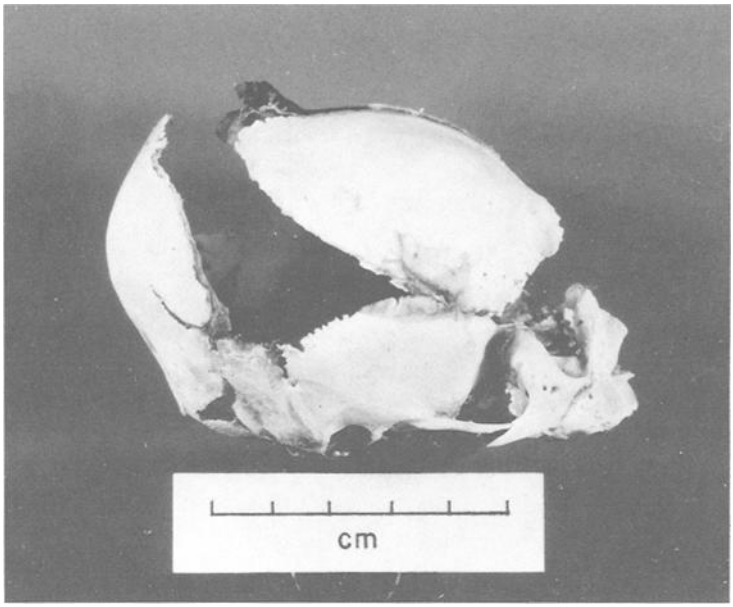

FIG. 1—*Photograph of the skull of a neonate exhibiting bilateral absence of the parietals (lateral view).*

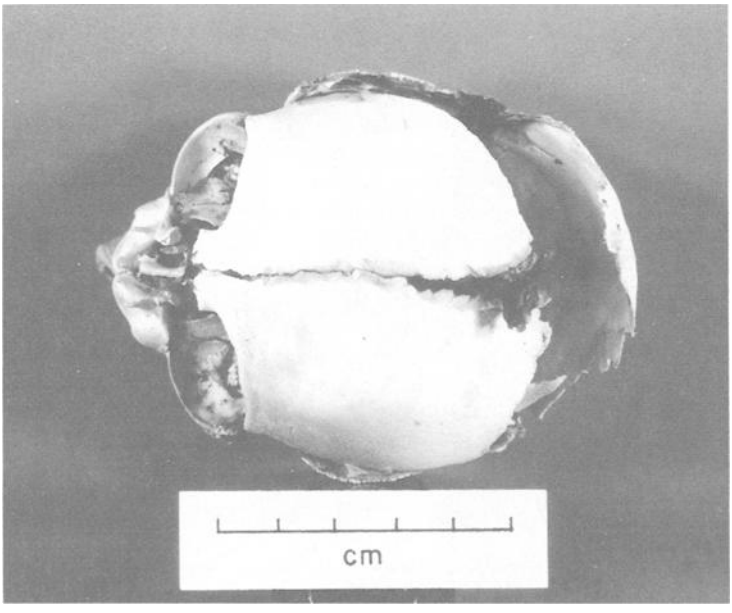

FIG. 2—*Photograph of the skull of a neonate exhibiting bilateral absence of the parietals (cranial view).*

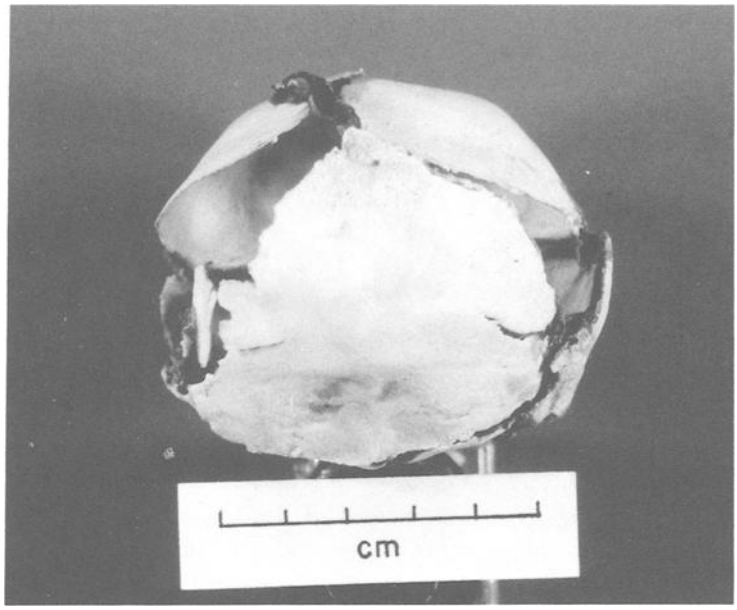

FIG. 3—*Photograph of the skull of a neonate exhibiting bilateral absence of the parietals (occipital view).*

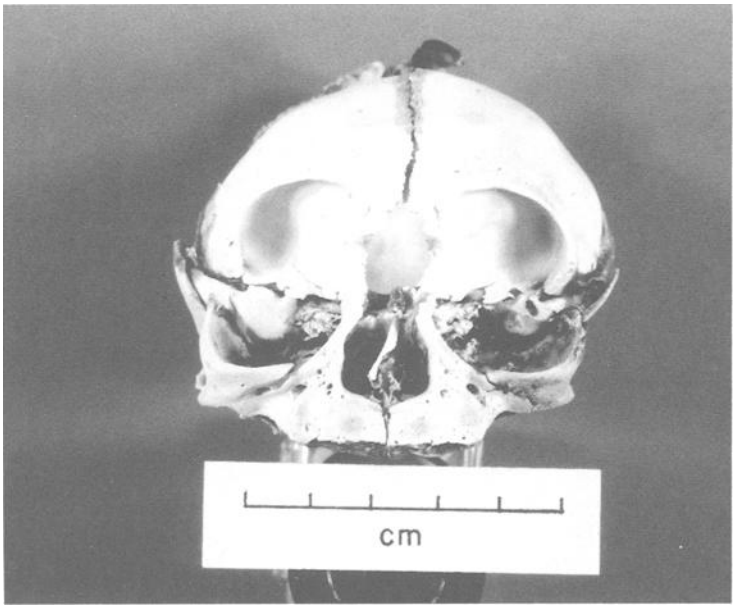

FIG. 4—*Photograph of the skull of a neonate exhibiting bilateral absence of the parietals (frontal view).*

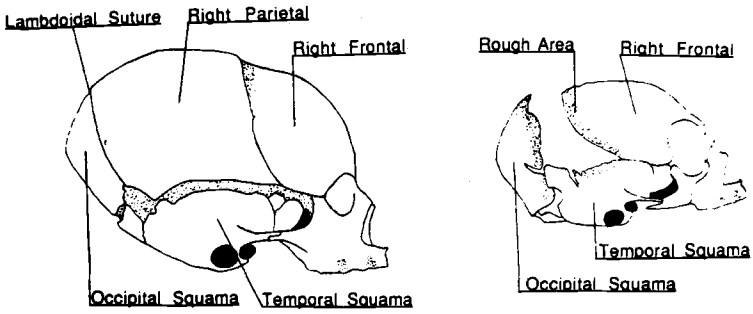

FIG. 5—*Comparison of normal cranial bone morphology with that of the skull exhibiting bilateral absence of the parietals.*

Similar splits are found in the occipital bones of fetuses from the fourth to the tenth lunar month, but these splits are closed in newborn infants and are completely obliterated in the first year of life as the cranial bones grow to accommodate the rapidly expanding brain. Table 1 presents a comparison of the cranial measurements in this case with those reported by Fazekas and Kosa [*1*] for infants of corresponding age. A number of those cranial bones present display evidence of unusual growth patterns. The surface of the posterolateral edge of the frontal bone displays a 2.3-cm-wide band which is rough and uncharacteristically thin when compared with the same area on the frontal bone of a normal newborn (Fig. 6). The same condition was noted on the squamo-occipital bone from the lambdoid suture to an area approximately 1.8 cm inferior to it. This condition is characteristic of these bones in a normal cranium at about four to eight lunar months, which is before their outer edges have met the parietal bone and begun to thicken. This roughness is normally absent in the cranial bones of fetuses in their third trimester. The author suggests that this condition persisted in this case as a result of the lack of forces normally generated by the apposition of these bones with the parietals.

A search of the literature produced one article relating to congenital absence of the parietals. However, this article, which is in Polish [*2*], is actually a discussion of three cases of *parietalia permagna* (enlarged parietal foramina). Zabek [*2*] described enlarged parietal foramina in three individuals; a 25-year-old woman and the 7-year-old and 3-month-old sons of two of her sisters. In the 25 year old and 7 year old, the foramina were 4 cm or less in diameter, with one present on either side of the sagittal suture. In the 3-month-old individual there was one 6 by 7-cm foramen centered on the sagittal suture and extending equally into both parietal bones. Other than the lack of protection afforded by the missing skull bone in these cases, the condition did not result in significant morbidity. According to Zabek, the *parietalia permagna* begins as a single defect, which is progressively bisected along the sagittal suture by the growth of a bony "bridge" of lamellar bone. This process, as well as some additional reduction in the size of the perforations, ends at or about the age of 3 years [*3*].

Although the subjects in all three cases were closely related, there was no evidence of a similar defect among the parents or siblings of any of the probands. There were no apparent environmental causes for the defects, and all of the subjects were the results of normal pregnancies. Because the anomaly is expressed in related individuals of both sexes, and the affected children were of unaffected parents, the possibility of an autosomal recessive gene cannot be excluded.

This, however, does not explain the total absence of parietal bones; it must be noted that, regardless of the size of the defect, in cases of *parietalia permagna*, there is some parietal bone. There is no evidence of the parietals in the case described here.

TABLE 1—*Comparison of cranial measurements for this case with those reported by Fazekas and Kosa* [2] *for infants of corresponding age.*

	Frontal Squama, mm				Temporal Squama, mm			Occipital Squama, mm			
	Height		Width					Height		Width	
	Cord	Perimeter	Cord	Perimeter	Height	Width	Length	Cord	Perimeter	Cord	Perimeter
Mean of 10-lunar-month females [2]	54.9	64.7	45.1	54.5	24.2	32.5	34.2	54.9	68.5	58.2	69.2
Measurements from the cranium without parietals	53.5	58.0	53.5	52.0	35.0	39.0	41.0	53.0	68.0	57.0	62.0

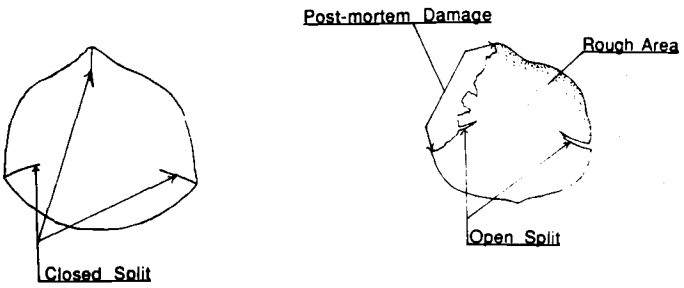

FIG. 6—*Comparison of a normal newborn occipital* (left) *and that of the case in question with bilateral absence of the parietals* (right).

Acknowledgments

The line drawings for Figs. 5 and 6 were produced by Trudi Butler.

References

[*1*] Fazekas, I. G. and Kosa, F., *Forensic Fetal Osteology*, Akademiai Kiado. Budapest, 1978.
[*2*] Zabek, M., "Congenital Absence of the Parietal Bones in a Family," *Wiadomosci Lekarskie*, Vol. 40, No. 1, 1987, pp. 33–38.

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