CRANIOLACUNIA OF THE NEW-BORN

by

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Introduction

Craniolacunia or Luckenschadel skull of the new-born is a congenital dysplasia of the vault of the foetal skull, the base being normal. The relative frequency of this dysplasia can be judged by the fact that in 12 months in the x-ray department of Lady Hardinge Medical College and Hospital 4 cases were seen while only one of another but better known congenital abnormality, namely craniostenosis was observed. This report has been prompted in view of this frequent occurrence, 0.94% incidence of all births in Great Britain (Hartely & Burnett) and relatively less recognition both in the antenatal and neonatal periods. No apology is therefore needed if the attention of obstetricians, paediatricians and radiologists is drawn to this frequent occurrence in cases with spinal defects.

Review of Literature

The accurate earliest description of craniolacunia was that given by Goodhart in 1886. In the same year Hale White used the term trabeculated skull and Engstler in 1905 called it Luckenscadel, meaning fenestrated skull.

Vogt & Wyatt in their excellent review of 54 cases in 1941 termed it craniolacunia, considering such a term to be of inter-national usefulness. In 1943 Hartley and Burnett repoted 28 cases with their post-mortem x-rays and also stressed the importance of ante-natal recognition of the condition.

Durand and Zunin in 1955 described a case of craniolacunia with ageneses of the septum pellucidum and spina bifida. In 1958 Pullon reported a case with phenylphyruvic oligophrenia. He makes one think of in-born errors of metabolism as an associated or possible cause.

Roentgenographic Appearances

Being essentially an abnormality of the developing vault of the foetal skull, the x-ray shows a net-like reticular pattern of bony ridges, which sharply delineate, and separate round or elliptical defects wherein ossification is either diminished or absent. This unmistakable appearance of coarsely arborizing ridges and depressions is in great contrast to the orderly more parallel and linear pattern of the cerebral gyri and sulci.

Spine. Shows deficient pedicles and laminae of the region involved with a soft tissue mass posteriorly, a meningo or meningo-myelocele.

Ante-natal Recognition. The shadow cast by the normal vault of the

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foetal skull is smooth, regular and of even density, interrupted only at the sutures. In craniolacunia the margin becomes of variable thickness and density and irregular shape. In such cases a spinal deformity should be searched for, by taking antero-posterior and lateral views of the foetal spine, to show broadening of the vertebrae in the antero-posterior position of the spine, with wide separation of the pedicles, so that the impression obtained is of a sacrum prolonged upwards. In the lateral view of the foetal spine deficient laminae and pedicles are seen and the vertebral bodies appear to lie unduly near the uterine wall. This is sufficient evidence to expect the presence of a meningo-myelocele in addition, Brailsford, 1942) to the craniolacunia.

Pathology

Engstler in 1905, Hartley and Burnett in 1943, Wyatt and Goldenberg in 1948 have conclusively shown the ridges to be areas of lamellar bone containing the beginning of Haversian systems, while the lacunae show fragmented areas of osteoid material. The lacunar defects are bridged by membranous diaphragms of periosteum and dura and termed fenestra. Some defects may have an additional covering of bone which corresponds to the outer table of the skull, the inner being incomplete, called lacuna. Both may however, co-exist in the same skull. Wyatt and Vogt (1941), in their well documented review, have shown that in 43% of cases of meningoceles, craniolacunia occurred, there being no relation to the size of the meningocele, but the occurrence with thoracic meningomyelocele was more frequent than meningoceles in any other region.

Case Reports

In none of the cases to be reported were the mothers x-rayed in the ante-natal period. Two were delivered in hospital and the other two came to hospital for meningoceles and irregularity of the skulls was felt, and child sent for x-ray skull as well.

Case I. S. D. full-term infant, born after a prolonged labour, to a primigravida.

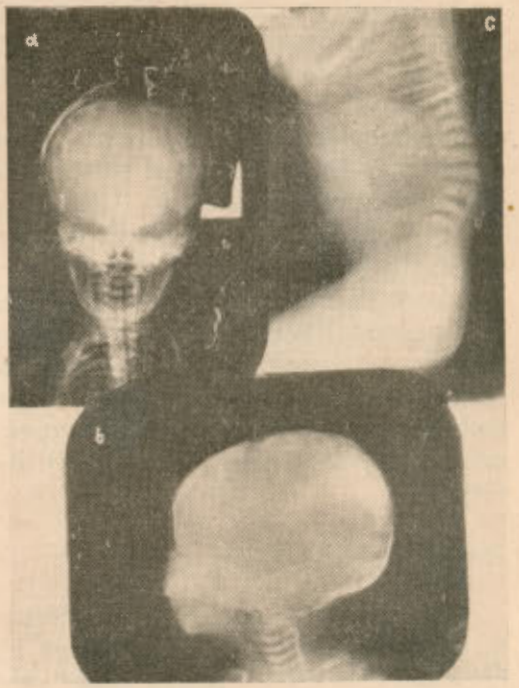

Fig. 1
(a) A.P. view of the skull. (b) Lateral view of the skull. (c) Lateral view of the spine.

Skull x-ray revealed a cranio-lacunia.

Lumbar spine:—Deficient pedicles and laminae with soft tissue mass which clinically was meningo-myelocele. The infant had paraplegia. No other congenital abnormality found.

Case II. S.S. full-term infant, normally delivered. X-ray skull revealed mild cranio-lacunia which was felt clinically; spina bifida was present but no meningocele. No other congenital abnormality found.

Case III. Delivered outside. Craniolacunia with lumbar meningo-myelocele which brought the child to hospital, no other abnormality present.

Case IV. Delivered outside. Craniolacunia with dorso-lumbar meningo-myelocele which bought the child to hospital, no other abnormality present.

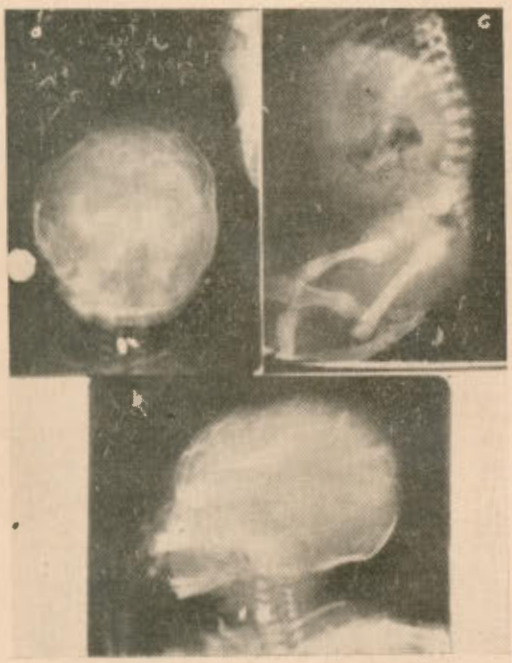

Fig. 2
(a) P.A. view of the skull. (b) Lateral view of the skull. (c) Lateral view of the spine.

Comments

Various views have been put forward from time to time regarding the aetiology, but all evidence points to the faulty prenatal ossfication, the actual mechanism of which is still obscure. The idea that convolutional cerebral markings are the cause has been practically dropped. The formation of the bones of the cranial vault may be under the same influence prenatally as the closure of the neural crests and their surrounding mesoderm, because of the association of craniolacunia with spina bifida and meningocele and the very rare occurrence of craniolacunia without meningocele or spina bifida. The fact, which is striking for a congenital abnormality and almost unique, is that the defect becomes less and less and spontaneously disappears when present by itself, thus its real importance lies not in the arborising ridges of the skull, but in the associated more dangerous developmental anomalies of meningoceles and meningo-myeloceles. The importance of its antenatal recognition has been adequately stressed by Hartley and Burnett, on which account modifications in the conduct of labour might be indicated. Though very conscious of this abnormality and its ante-natal recognition, I was not able to find a single case in the pregnancies radiographed in 1959-1960. In none of the 4 cases reported were the mothers radiographed ante-natally. Thus the plea for antenatal radiographs in cases of prolonged labour with adequate pelves, which may reveal the cause of obstructed labour, considering the frequency reported. The parents of these children were not near relatives and the mothers had no history of any fever in the gestation period, or any other abnormal children.

Summary

4 cases of craniolacunia reported. The literature reviewed, the antenatal recognition stressed for modifications in conduct of labour, for the

associated anomalies of meningo or meningo-myeloceles.

Acknowledgments

My thanks are due to the units of Gynaecology and Surgery where these patients were admitted and to the Medical Superintendent for permission to publish this report.

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