CARIES CRANII

(TUBERCULOSIS OF THE FLAT BONES OF THE VAULT OF THE SKULL)

A. C. DE VET, M.D.
Neurological and Neurosurgical Clinic “St. Ursula,” Wassenaar, Holland

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Three reasons seem to justify the report of the following case of caries cranii. (1) The disease is an uncommon condition to which little attention has been paid by neurosurgeons. (2) Although rare, neurological symptoms may be caused by tuberculosis of the skull. These symptoms were among the outstanding features in our case. The disease therefore is one with which neurosurgeons should be familiar. (3) Streptomycin was used locally and the possible influence of it is discussed.

It is difficult to find a full description of caries cranii in the neurosurgical literature. Dandy\(^4\) merely mentions the disease, states that the sick bone has to be removed completely, and gives no results. Davis\(^5\) also refers to it very briefly and probably quotes from the article of Strauss\(^18,19\) (see below). Obviously, Sachs\(^14\) and Bailey\(^2\), whose books deal only with cerebral tumours, do not mention it, but that the subject is not discussed by Maxwell\(^10\) in his description of congenital traumatic and inflammatory disorders of the cranium, indicates that neurosurgeons generally have no great interest in tuberculous infections of the skull.

Textbooks of surgery as a rule give little attention to the disease: Dandy\(^4\) has been cited above. Gauvain\(^7\) speaks of a rare but serious condition which starts in the diploe but results in general dissemination with correspondingly bad prognosis. This statement is not in accordance with the experiences reported by Strauss\(^18,19\), Joutard (cited by Strauss) and others, but Babcock\(^1\) holds the same opinion, giving a mortality rate of 50 per cent.

Pancoast, Pendergrass and Schaeffer\(^12\) in their textbook on roentgen diagnosis give the impression that among radiologists also there is only scanty interest. Even in books on tuberculosis of bones and joints, there may be no mention whatever of caries cranii (Girdlestone\(^8\)), or it is discussed only briefly (Kremer and Wiese,\(^9\) Sorrel and Sorrel-Dejerine\(^10\)).

Although I can by no means be complete in reviewing books, the above citations from well-known examples are sufficient to show how little information they contain on this subject. Those who are particularly interested will have to resort to special articles. However, as far as I could trace, these are exceedingly rare in neurosurgical literature; neither in the Zentralblatt für Neurochirurgie nor in the Journal of Neurosurgery has any article on caries cranii been published.

One of the most important and recent articles is that of Strauss,\(^19\) an excellent review, in which he collected 200 cases from the current literature and added 3 of his own. Many of the details, mentioned below, are taken from this review.
It is generally accepted that the tuberculous infection reaches the bones of the skull through the blood stream almost always from a distant focus. Several cases of so-called primary infection are reported but only in those where an open wound has been contaminated or the infection is directly conducted from an existing tuberculous infection in other parts of the head (ear, nose, eye, etc.) can this be fully accepted; in all other cases there remains some doubt about a concealed tuberculous focus elsewhere in the body (thoracic or abdominal lymph nodes). In the majority of cases there was phthisis of the lung or tuberculous cervical lymphadenitis, but many other localisations of tuberculous processes have been reported as the supposed primary source of the cranial infection.

The haematogenous spread makes it acceptable that the initial localisation is in the cancellous bone of the diploe. Because the flat bones of the skull contain such a small quantity of diploe it is easily understood that the number of skull infections is very low compared with that of other bones. Of all cases of bone tuberculosis in different statistics the localisation in the skull was present only in 1.37 per cent (Parel), 1.35 per cent (Claeys), and 0.2 per cent (Berk). As the frontal and parietal bones contain relatively more diploe than the other flat bones of the vault, it is a logical consequence that these two bones (which, as another argument, together take up about three-quarters of the surface of the skull!) show the highest incidence of infection (172 out of 206 cases). It may be that the influence of trauma, which according to Schüller (1878), Volkmann, Strauss and others is indisputable in many cases, has to be taken into account too, because the frontal and parietal bones are more exposed to trauma than the other parts of the skull. It is generally observed that children show a much higher tendency to caries cranii than people in the later decades of life. Three-fourths of all cases occur before the 20th year (Sorrel and Sorrel-Dejerine). A satisfactory explanation cannot be given. Strauss, Reber, and others discuss the possible influence of the numerous traumatia in childhood; the fact that males are more often afflicted than females (Labhardt's statistics showed 69 per cent in males and 31 per cent in females), which is ascribed to the rôle of a trauma, they regard as a point in favour of their supposition.

Most authors agree in distinguishing two types of the disease: a, the circumscribed (perforating) type (Volkmann, Gangolphe), and b, the diffuse progressive type (Koenig).

Type a generally is described as a round, usually punched-out looking defect through the entire thickness of the skull. This can be seen in natura as well as in the roentgenograms. However, if one pays more attention to the various differences in the spread of the infection throughout the bone, it would not be surprising if atypical defects would prove to be more numerous.

In the majority of cases it is stated that the tabula interna is more widely affected than the external table; sometimes only the diploe are involved. These various conditions must give different X-ray pictures and in our own case one cannot speak of really sharply outlined round defects. The centre