HYPEROSTOSIS CORTICALIS INFANTALIS (CAFFEY'S DISEASE)*

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Infantile cortical hyperostosis is a disorder affecting the skeleton and some of its contiguous fascias and muscles. It is suggested that infantile cortical hyperostosis is a prenatal collagen disease.[1]

The early stage is of acute inflammation and loss of the periosteal and subperiosteal definition. There is a fibrous and osteoblastic reaction and overlying tissue including muscle is involved. No bacteria are seen. Later, there is subperiosteal new lamellar bone formation. The periosteum is thickened and hyperplastic and the overlying soft tissues are oedematous and sections show round-cell infiltration. The subacute phase re-establishes periosteum as an entity. The later remodelling stage removes the extraperipheral bone from within, resulting in dilatation of the medullary cavity.

There is evidence to suggest that infantile cortical hyperostosis had been recognized in 1930.[2] Caffey and Silverman first described the disease in 1946.[3] Smyth *et al.*[4] also recorded cases in 1946. Altogether 102 cases have been reported, Sidbury and Sidbury[5] contributing 69 reports and Holman[6] describing 33 cases. Infantile cortical hyperostosis has been described in Negroes but seems rare in the South African Bantu.

CASE REPORT

The patient, a 3-year-old Bantu male, had a normal birthweight. Two siblings were in good health. The mother stated that the child's jaw was swollen and that he had refused the breast in early infancy. The child had resented handling and had been relatively immobile for the first few weeks of life. He had appeared to be in pain and resented handling of his back and legs.

Striking features included obvious pain on movement, swollen, tender thighs and thin wasted legs. No abnormality was present in the skull, the circumference being normal. The fontanelles were closed. His teeth were very carious. A low-grade persistent pyrexia was a feature during hospitalization. An intercurrent chest infection developed and the child died. Autopsy was refused by the parents.

Abnormal findings included a persistently raised serum alkaline phosphatase (335 - 420 units). A low serum calcium of 3·8 mEq./litre and a raised sedimentation rate of 31 mm./hour were present.

Radiological features included decreased bone density which was striking in the vertebral column as well as the upper and lower limb girdles. The mandible appeared enlarged and a cyst-like enlargement on the left side was evident. The scapulae had lost their clear outline and an excessive amount of osteoid overgrowth was present. The ribs had decreased in density and appeared rarefied. The anterior ends of the ribs did not demonstrate any rachitic changes.

The long bones of the upper and lower limbs showed a medullary expansion of the shafts with thin cortical walls, i.e. the appearance described with chronic cortical hyperostosis. The metaphyses did not show any abnormal features (Figs. 1 and 2).

*Date received: 27 August 1968.

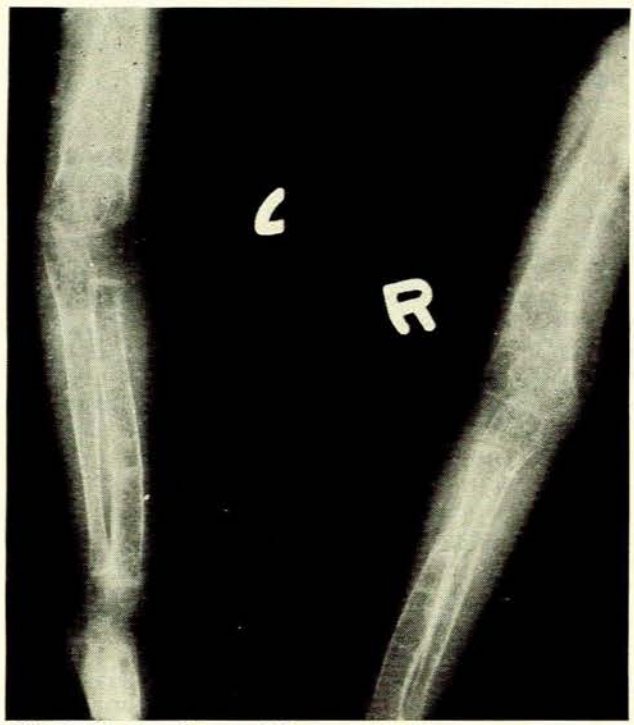

Fig. 1. The long bones of the upper limbs show medullary expansion of the shafts with thin cortical walls.

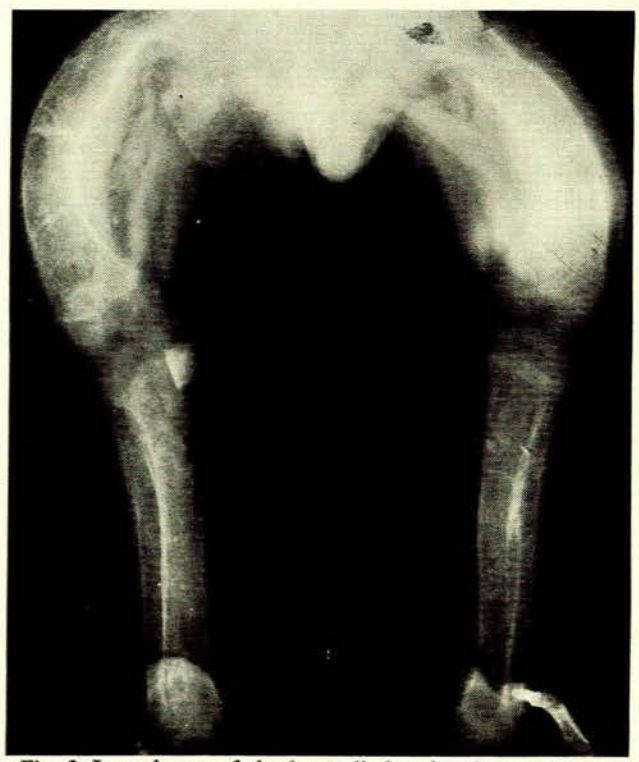

Fig. 2. Long bones of the lower limbs, showing medullary expansion and angulation.

Differential Diagnosis

The rare genetic disorder of chronic idiopathic hyperphosphatasia[7,8] was considered a less likely diagnosis; only 21 cases had been recorded by 1965. The distribution of bony lesions differed from that of infantile cortical hyperostosis. Traumatic periostitis does not produce the biochemical changes described in Caffey's syndrome and was discarded as a likely diagnosis.

The normal alkaline phosphatase levels in pyogenic osteitis, congenital syphilis, vitamin-A intoxication and vaccinial osteomyelitis precluded consideration of these conditions. The history and laboratory and radiological findings were also unfavourable to these diagnoses. Rickets was not thought a likely possibility as the shafts of the bones were predominantly involved with no rachitic changes at the bone ends.

DISCUSSION

Aetiology

The true aetiology has not yet been established but many ideas have been suggested. Convincing evidence favours genetic factors as being important in the development of infantile cortical hyperostosis; and many families with several members and even several generations involved have been described.[9-14] Two papers report the diagnosis *in utero*.[15,16] An allergic aetiology has been suggested several times.[1,17,18] Infection has not been proved as a cause, although in one case a coxsackie virus was isolated.[9]

The condition seems rare in the South African Bantu but in Holman's[6] 33 cases, 7 were White and 26 Negro. It is slightly more common in males. In the series of 69 cases 37 were males and 32 females.[5]

The average age of onset is about 9 weeks. Cases may present at birth and even *in utero*. Cases in which the onset occurs after 5 months of age are considered invalid by Caffey and others.[5,6]

The illness takes one of three forms, being acute, relapsing or chronic in nature. The important triad is fever, irritability, and swelling of bones, in any order of onset. Erythema and increased warmth of overlying tissues may be a feature. Movement of the involved part is limited by pain, sometimes leading to pseudoparalysis. In many cases swelling of the mandible is an early finding.[19,20] Some unusual presentations have been described:

A child of 8 months developed proptosis following a cold and X-rays revealed hyperostosis of the orbital region. Four other cases have had orbital swellings.[5,19] One child had hyperostosis of the side of the nose.[21] Two children had eventration of the diaphragm related to scapular hyperostosis. Pleuritic pain may result from rib involvement.[6]

The illness may run a benign course, lasting from 3 to 9 months, with X-ray recovery taking up to 27 months.

Some patients progress to a chronic form of the disease. Others recover and then relapse. Intercurrent infection has accounted for death in some instances, while in others no cause for death has been determined.

Laboratory Findings

Anaemia is frequent. A raised erythrocyte sedimentation rate and alkaline phosphatase level are almost always present. Leucocytosis is common and in 20% of cases a low calcium reading is found.

X-ray changes include massive mandibular hyperostosis and narrow margins of increased density below the periosteum which later thicken and produce cortical hyperostosis. The change may progress and produce marginal irregularities. In all the hyperostotic bones there is striking absence of metaphyseal changes.

The chronic form may show residual cortical thickening. Dilatation of the medullary shafts and resorption of the hyperostosis will produce dilated shafts with thin cortical walls.

Table I compares the incidence of bone involvement as reported by Sidbury and Sidbury, and by Holman.

TABLE I. BONES INVOLVED — TWO SERIES

Bone	*Sidbury and Sidbury*[5] *(69 cases)*	*Holman*[6] *(33 cases)*
Mandible	77%	94%
Tibia	44%	20%
Ulna	36%	15%
Clavicle	35%	21%
Ribs	32%	9%
Humerus	32%	9%
Femur	32%	15%
Fibula	18%	9%
Pelvis	6%	—
Skull	3%	—
Scapula	—	12%

Treatment

The majority of patients recover completely but the disease is painful and debilitating and occasionally it becomes chronic.

Apart from general supportive measures while the child is ill, the treatment of choice is the use of steroids. These often produce dramatic relief of pain and improvement in the general condition.

SUMMARY

A review of reported cases of chronic infantile cortical hyperostosis is presented. A probable case is reported where the biochemical investigations support the diagnostic suggestion. This seems to be a rare disease in the South African Bantu.

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