

Technologist Case Report

Cranial Hyperostosis

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Cranial hyperostosis is one of many common benign abnormalities seen as a result of today's technetium bone-imaging procedures. Optimum imaging interpretation depends upon its recognition as such.

With the advent of technetium-labeled phosphorus compounds, bone imaging has become one of the most important and essential diagnostic tools for clinicians today. Bone images are obtained from patients with either malignant or benign bone diseases. Common, benign abnormalities seen on these bone images include osteoarthritis, healing fractures and wounds, muscular and bone traumas, growth lines, irradiated tissue, bone marrow aspirations, and—especially among women—cranial hyperostosis.

Cranial hyperostosis is an irregular, increased thickening of the internal surface of the skull. When it involves the frontal bone, it is called hyperostosis frontalis interna; extending into the parietal region, it is designated as hyperostosis frontoparietalis. Rarely, though, does it involve all eight of the cranial bones.

This irregular thickening of the inner table and at times the diploë of the cranial bones has been recognized since at least 1719 when Morgagni first described it. Since then it has frequently been suggested to be a manifestation of an endocrine disorder (1).

A long list of symptoms, signs, and abnormal laboratory findings has been attributed to cranial hyperostosis. The complaints range from headaches, dizziness, poor vision, anxiety, and depression to backache, menstrual disturbances, diabetes insipidus, and joint pains, among others. Some physical findings have been obesity, hirsutism of the face and body, optic atrophy, epilepsy, thyroid enlargement, osteoporosis, and hypertension. Abnormal laboratory findings include hypercalcemia, increased spinal fluid pressure, atrophy of the frontal lobes, arrhythmia in the electroencephalograms, gout, and myxedema (1). Increases in serum alkaline phosphates levels and in liver enzymes are also being investigated in connection with this condition. Because the majority of the bone-imaging patients are

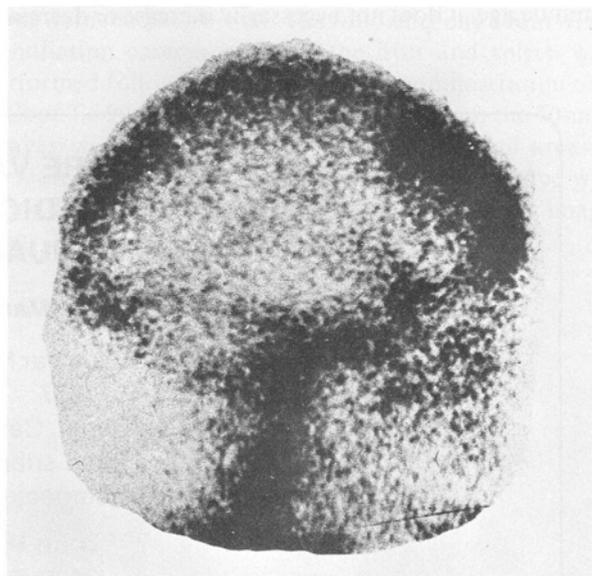


Fig. 1. Lateral skull view of hyperostosis frontalis interna produced by bone imaging with a technetium-labeled phosphorus compound.

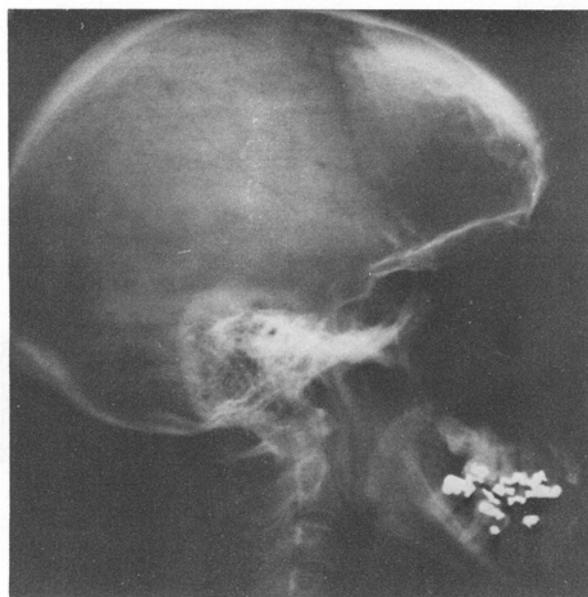


FIG. 2. Lateral x-ray skull view of hyperostosis frontalis interna.

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being evaluated for metastatic bone disease, these abnormal laboratory findings are not at all uncommon.

Some studies have suggested an increase of frequency of hyperostosis frontalis interna among patients with psychiatric illnesses and emotional disturbances. However, Gegick (1) points out that a series of autopsies performed on psychotic females and males failed to prove this correlation. Hyperostosis frontalis has also been described in dystrophic myotonia (Steinert's disease) and in the Troell-Junet syndrome with acromegly, diabetes mellitus, and toxic goiter as associated features.

Cranial hyperostosis occurs in adolescents of either sex, but is most frequently seen in women. It is also more common among older patients. If this thickening begins in middle age, it does not necessarily increase or decrease

with aging. Cranial hyperostosis apparently does not correlate with cerebral atrophy and presently should be regarded as an innocent abnormality, not a progressive function of aging (2).

Figures 1 and 2 are corresponding examples of hyperostosis frontalis interna in a 63-year-old woman. Because its occurrence and innocence are widely known to physicians, skull x-rays are seldom ordered to verify the cranial hyperostosis seen on bone-imaging procedures.

References

1. Gegick CG, Danowski TX: Hyperostosis frontalis interna and hyperphosphatasema, *Ann Inter Med*, Vol 79: pp 71-74, 1973
2. Newton TH, Potts DG: *Radiology of the Skull and Brain*, . St. Louis, C. V. Mosby, 1971, p 133