A Case of Ossifying Fibroma of the Parietal Bone

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Abstract

A rare case of a 13-year-old boy with ossifying fibroma in the parietal bone is presented, and differential diagnosis from other fibro-osseous tumors such as osteoma and fibrous dysplasia is briefly discussed.

X-ray films of the skull showed a round, well-circumscribed osteoplastic lesion with a few radiolucent spots in its interior in the right parietal bone. Tomograms of the lesion revealed a smooth margin with an egg-shell appearance and some delicate streaks. Histological findings of this lesion showed osteoblastic rimming, some infiltration of xanthoma cells and lamellar bony structures.

Histological distinction between ossifying fibroma and fibrous dysplasia was emphasized.

Key words: ossifying fibroma, parietal bone, radiographical findings, histological findings

Introduction

Ossifying fibroma is a fibro-osseous tumor which usually involves the mandible or maxilla, and rarely involves the cranial vault. We report a very rare case of ossifying fibroma involving the parietal bone, and discuss the differential diagnosis of this tumor from other fibro-osseous tumors on the basis of radiological and histological studies.

Case Report

A 13-year-old boy was admitted to our clinic in August, 1979, complaining of a painless swelling in the right parietal region for the previous 2 years. He had a minor head trauma 3 years previously, but he did not remember exactly the site of the trauma. There was nothing particular in his past medical history.

In a physical examination on admission, there was a smooth, bony-hard tumor measuring 4 cm in diameter in the right parietal region. The tumor was firmly fixed to the underlying bone. Neurological examination was normal. Electroencephalogram and laboratory data were also normal. The levels of serum calcium and phosphate were within normal ranges.

X-ray films of the skull revealed a round, well-circumscribed osteoplastic lesion with a few radiolucent spots within it in the right parietal bone (Fig. 1).

Tomograms of the skull showed a smooth margin of the tumor with some radiolucencies within it, and numerous delicate streaks were noted within the radiolucent part. The underlying inner table of the skull

Fig. 1 Lateral view of a skull plain film showing a round, well circumscribed tumor, in which a few radiolucent spots were noted.
appeared to be intact (Fig. 2).

An operation was performed on August 6, 1979. The tumor was well-circumscribed and its external surface was covered with smooth thinned cortical bony structure of the outer table of skull. The base of the tumor was loosely adherent to the dura, but it was easily removed from it. En-bloc resection of the lesion was performed by craniectomy sufficiently far from the margin of the tumor, and the cranioplasty was performed using a plastic resin. Macroscopically, a section of this bone tumor showed a lens-shaped tumor expanding outwards and the inner table of skull was not involved.

Microscopically, the tumor consisted of fibrous stroma and poorly oriented trabeculae of bone. Stromal spindle-shaped fibroblasts were mostly uniform in size and shape without mitotic images, and some infiltration of xanthoma cells were observed (Fig. 3). Osteoblastic rimming was observed around the bony trabeculae, and a few multinucleated osteoclasts were observed in some fields (Figs. 4, 5). Lamellar structures were characteristically noted in the bony trabeculae under a polarized light microscope.

The patient recovered uneventfully. He was asymptomatic and X-ray films of the skull showed no recurrence of the bone tumor 1 year and 3 months after discharge.

**Discussion**

Montgomery described his own three cases with fibroma of the jaw, in which he observed various amounts of ossification within the tumor. He further collected similar cases from the literature and called them ossifying fibroma. In general, ossifying fibroma is a slow growing tumor which involves predominantly the mandible and maxilla of children but rarely involves
the frontal,\textsuperscript{2,6,10} temporal,\textsuperscript{7} sphenoidal\textsuperscript{3}) and occipital\textsuperscript{12}) bone. To our knowledge, there have been few cases of ossifying fibroma involving the pariental bone.\textsuperscript{11})

Smith and Zavaleta analyzed a series of 20 ossifying fibroma and 20 osteoma of the cranial and facial bones, and they postulated that ossifying fibroma could eventually be transformed into a typical osteoma.\textsuperscript{3}) Reed and Hagy reported that ossifying fibroma might assume the appearance of fibrous osteoma by slow replacement of woven bone by lamellar bone with the passage of time, and that ossifying fibromas of the maxilla and paranasal sinuses reported in the literature were probably examples of an early stage of fibrous osteoma in which there was a predominance of woven bone but in which it was also possible to find lamellar bone. Fibrous osteoma might also mainly mature into osteoma.\textsuperscript{4}) From the radiological point of view, this lesion tended to increase in bony density with the age of the lesion when patients with ossifying fibroma have been followed for several years.\textsuperscript{7})

Nevertheless, the transformation of an ossifying fibroma into an osteoma does not occur as a rule.\textsuperscript{8}) Sherman and Sterberg analyzed 12 cases with ossifying fibroma, and reported that ossifying fibroma was a separate entity among other fibro-osseous tumors from the clinical and radiographic features in their cases.\textsuperscript{7})

The histological appearance of ossifying fibroma differs from that of fibrous dysplasia. In the lesion of an ossifying fibroma, the bone spicules are randomly distributed in a fibrous stroma and there are osteoblastic rimings around the bone spicules. The bone spicules are composed of woven bone in the center of the tumor. However, lamellar transformation from woven bone is frequently seen in the peripheral part of the tumor. On the other hand, in the lesion of fibrous dysplasia, rimming of spicules with osteoblasts and lamellar appearance of bone spicules are rarely seen.\textsuperscript{9}) One of the histologically characteristic features which distinguishes a typical fibrous dysplasia from all other fibro-osseous lesions is the persistence of woven bone pattern with a complete lack of lamellar bone formation.\textsuperscript{4}) Moreover, ossifying fibroma is generally monostotic, circumscribed and expansile, and it can usually be differentiated from fibrous dysplasia by its clinical features.\textsuperscript{5,10}) Histological findings in our case showed this characteristic pattern of an ossifying fibroma.

The radiographic picture of ossifying fibroma is predominantly destructive at an early stage, and later it becomes a prominent feature and overtakes the earlier destructive stage. Ossifying fibromas are unilocular, oval or spherical lesions with "egg-shell" margins and some streaks in the interior. There is no breakage of cortical bone and intracranial extension of the tumor rarely occurs.\textsuperscript{5,7}) In our case, the lesion was located in the right parietal bone, and it was a round, well-circumscribed lesion bulging outwards. The margin of the lesion appeared to be of a thin egg-shell shape and the interior of the tumor was composed of a few radiolucent spots with delicate streaks on X-ray skull films.

Smith and Zavaleta stated that the clinical course of ossifying fibroma was variable, and that the tumor grew rapidly at first but then rather slowly. They also reported that, if removal of tumor was incomplete, ossifying fibroma would recur and grow to the size of the original tumor.\textsuperscript{8})

References

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