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Case Report

Ossifying fibroma: an uncommon differential diagnosis for T2-hypointense sinonasal masses

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ABSTRACT

Ossifying fibroma is a benign fibro-osseous lesion that occurs most commonly in the mandible of female patients. In rare cases, it affects the nasal cavity. The magnetic resonance imaging features may vary depending on the amount of fibrous and bony tissue in its composition. In these tumors, T2-hypointensity is a feature described in the peripheral ossified areas of the lesion, but it may present diffusely, especially when the degree of ossification is extensive. In this scenario, this particular characteristic on T2-weighted imaging is superimposable to the commonly described appearance of other lesions, such as non-Hodgkin's lymphoma, melanoma, and other sinonasal neoplasms with high cellularity and high nucleocytoplasmic ratio. In the present study, we report a case of ossifying fibroma of the nasal cavity that presented as a diffusely and homogeneously T2-hypointense mass, a finding that may cause difficulty in the differential diagnosis with other expansive sinonasal lesions.

Introduction

Ossifying fibroma (OF) is considered a rare benign fibro-osseous lesion that occurs most commonly in female patients during the third and fourth decades of life [1]. It mainly involves the mandibular and maxillary bones, although in rare cases it may develop within the nasal cavity or in long bones [2].

It is often discovered incidentally; nevertheless, it can be locally aggressive. It is best imaged by computed tomography (CT), with magnetic resonance imaging (MRI) serving for surgical planning or evaluation of complications [3].

Imaging features vary with the amount of fibrous and bony tissue within the tumor. Although early-stage lesions may have a thick peripheral rim of bone surrounding a fibrous soft-tissue center, late-stage lesions may be completely filled

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by bone [3]. On MRI, OF usually has low to intermediate signal on T1-weighted imaging (T1WI) and variable signal on T2-weighted imaging (T2WI). It is widely accepted that low signal on T2WI typically occurs in the ossified peripheral areas of the lesion, whereas higher signal tends to be observed in the nonossified central areas [4]. Despite this classical appearance, there have been some case reports that describe a distinct pattern of imaging presentation on which a largely calcified mass representing OF demonstrates an overall low signal on T2WI [4].

In this more calcified form of appearance, sinonasal OF may have T2WI signal features superimposable with other clinically important lesions that potentially affect the same anatomical region. These differential diagnoses include non-Hodgkin's lymphoma (NHL), whose signal hypointensity on T2WI sequences is explained by a variety of reasons: high cellularity and high nucleocytoplasmic ratio, which both shorten the relaxation time. In addition, sinonasal melanoma may present with similar T2WI hypointensity. However, in this particular case, the low signal is primarily due to the paramagnetic effect of melanin [3].

In the present study, we report a case of a patient who presented with a diffuse and homogeneously T2-hypointense nasal cavity mass—which ultimately turned out to be an OF—making it hard to exclude from the preoperative differential diagnoses more concerning lesions classically associated with this particular imaging pattern, such as NHL and melanoma.

Case presentation

A 23-year-old male patient was referred to the Otorhinolaryngology outpatient clinic with symptoms of a 6-month right progressive nasal congestion and 1 year bulging on the homolateral face when deep breathing. He denied nasal pruritus, sternal attacks, rhinorrhea, epistaxis, hyposmia, as well as weight loss and adynamia. He reported a car accident 2 years ago. He also confessed to being a former cocaine user and reported some episodes of left epistaxis during drug abuse. He has being abstinent for 3 months at the moment of the interview. Other aspects of the previous personal and family history are unremarkable.

Rhinoscopy showed an irregular expansive lesion obstructing the nasal cavity on the right. Other aspects of the physical examination were unremarkable. Nasofibroscopy and nasopharyngolaryngoscopy revealed a mass occupying the posterior two-thirds of the right nasal cavity, with a fleshy appearance, consistent with nasal tumor. Then, the more likely clinical hypothesis of olfactory esthesioneuroblastoma was suggested.

After that, the patient was referred for a CT scan, which was inconclusive, evidencing a bulky heterogeneous expansive mass with mild contrast uptake located in the right nasal cavity and ipsilateral ethmoidal and frontal sinuses (Fig. 1). Then, MRI was performed to clarify the diagnosis and to plan the surgery. In the images obtained by MRI, a solid expansive mass centered on the right nasal cavity was observed, with intermediate signal on T1WI and diffuse and homogeneous hyposignal on T2WI (Fig. 2). The lesion provoked destruction of the sinonasal skeleton and invasion of the right ethmoid and both frontal sinuses, as well as showed signs of possible intracranial extension (Fig. 3). The possibility of a tumor with high cellularity and high nucleocytoplasmic ratio, such as a lymphoproliferative lesion, a nasal melanoma, or an undifferentiated sinonasal carcinoma, was considered in face of the T2WI hyposignal of the lesion and its invasive pattern.

Because of the moderate growth of the lesion between CT and MRI examinations, it was decided to operate. Resection of the nasal tumor was performed by "the debulking technique" with dissection up to the skull base, evidencing a large area of meningeal exposure with a small extravasation of cerebrospinal fluid (Fig. 4).

In face of the malignancy suspicion, an anatomopathological freezing study was acquired during the surgical procedure, which resulted in no malignancy. After the fixation and the inclusion in paraffin of surgical specimens, histological sections revealed a well-delimited lesion composed of spindle cells with elongated nuclei in bone matrix associated with osteoblast rhyme and osteocytes without atypia. Mitotic activity was low and there was no necrosis; therefore, the findings were compatible with ossifying fibroma (Fig. 5).

In follow-up consults, which happened 3 and 9 months after the surgery, the patient was asymptomatic, with no evidence of residual lesion neither on physical examination nor on rhinoscopy.

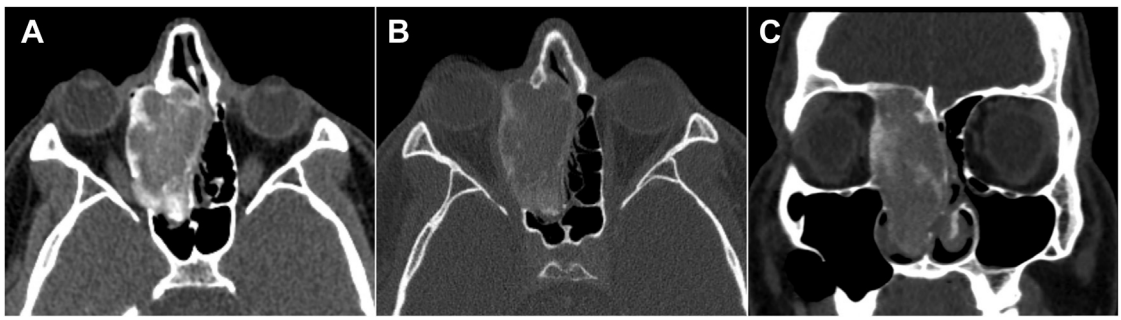

Fig. 1 – Twenty-three-year-old male CT images. (A) Noncontrast axial soft-tissue window. (B) Noncontrast axial bone window and (C) post-contrast coronal. There is a mass filling the right nasal cavity, with bony involvement and mild contrast uptake. CT, computed tomography.