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Giant convexity chondroma with meningeal attachment

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ABSTRACT

Objective: Intracranial chondroma is a rare and benign tumor with usual onset in young adulthood. The skull base is the most common site of occurrence although, less often, the tumors can appear at the falx cerebri or at the dural convexity. The differentiation of these lesions from meningiomas through imaging is generally difficult.

Patient and methods: Clinical case presentation and review of the current literature.

Results / Case presentation: We report a case of a 25-year-old male patient with a giant convexity chondroma with meningeal attachment in the right frontal lobe that was detected after a first generalized seizure. Based on the putative diagnosis of meningioma, the tumor was completely resected via an osteoplastic parasagittal craniotomy. The postoperative MRI confirmed the complete tumor resection. Histopathological analysis revealed the presence of a chondroma.

Conclusion: Intracranial chondromas are a rarity and their preoperative diagnosis based on neuroimaging is difficult. In young patients and those with skeletal disease, the differential diagnosis of a chondroma should be considered. In symptomatic patients, operative resection is sensible. In most cases total removal of the tumor is possible and leads to full recovery. When the finding is merely incidental in older patients, a watchful waiting approach is acceptable, given the benign and slow-growing nature of the lesion.

1. Introduction

Intracranial chondroma is a rare and benign tumor with an estimated incidence rate of 0.2–0.3% of all intracranial tumors [1–3]. These lesions were first described by Hirschfield in 1851 and usually occur in young adults [1,2,4]. The malignant form, chondrosarcoma, generally occurs later in life, presenting mostly in the fifth and sixth decades. There is no sex predilection [1]. These tumors commonly occur as isolated lesions. However, sometimes they may be associated with syndromes like Ollier's disease (multiple enchondromatosis with areas of dysplastic cartilage) or Maffucci's syndrome (multiple enchondromatosis with subcutaneous hemangiomas that may affect the skin, mucosal surfaces and internal organs). In these syndromes, the most frequent locations of enchondromas are the small bones of the hands and feet; the femur, humerus, tibia and pelvis are less commonly affected [5–7]. The skull base is the common site of occurrence of intracranial chondromas and only 20% of these tumors have meningeal origin [8,9]. Rarely, they arise from the dural convexity or the falx [1–3,9–17]. Intracerebral location is extremely rare and has only been described in a few cases [18–20]. The patients present with symptoms of raised intracranial pressure, seizures and focal neurological deficits. Preoperatively, chondromas can be difficult to distinguish from meningiomas. They may also be confused with chordomas, craniopharyngiomas or even arterial aneurysms [1,11]. Bone destruction occurs in over 50% of the cases, whereas irregular calcifications are seen in about 60%. Intracranial chondromas may also produce hyperostosis of the inner table of the skull [13,15,21]. Peritumoral edema is rare and these tumors appear avascular on angiography [1,8,22]. The MRI intensities of these lesions have been reported to be nonspecific [1,8,10,16,21,22] and their etiology has not yet been resolved. Cartilaginous metaplasia of meningeal fibroblasts has been suggested, as have other origins, such as ectopic embryologic remnants of cartilage cells, metaplasia of perivascular mesenchymal tissue, or traumatic displacement of cartilaginous elements [1,10,13,18,19,21,22].

2. Patient and methods

Clinical case presentation and contemporary review of the literature using the MEDLINE database, which was accessed via PubMed and interrogated using the following search strategy in November 2017:

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0303-8467/

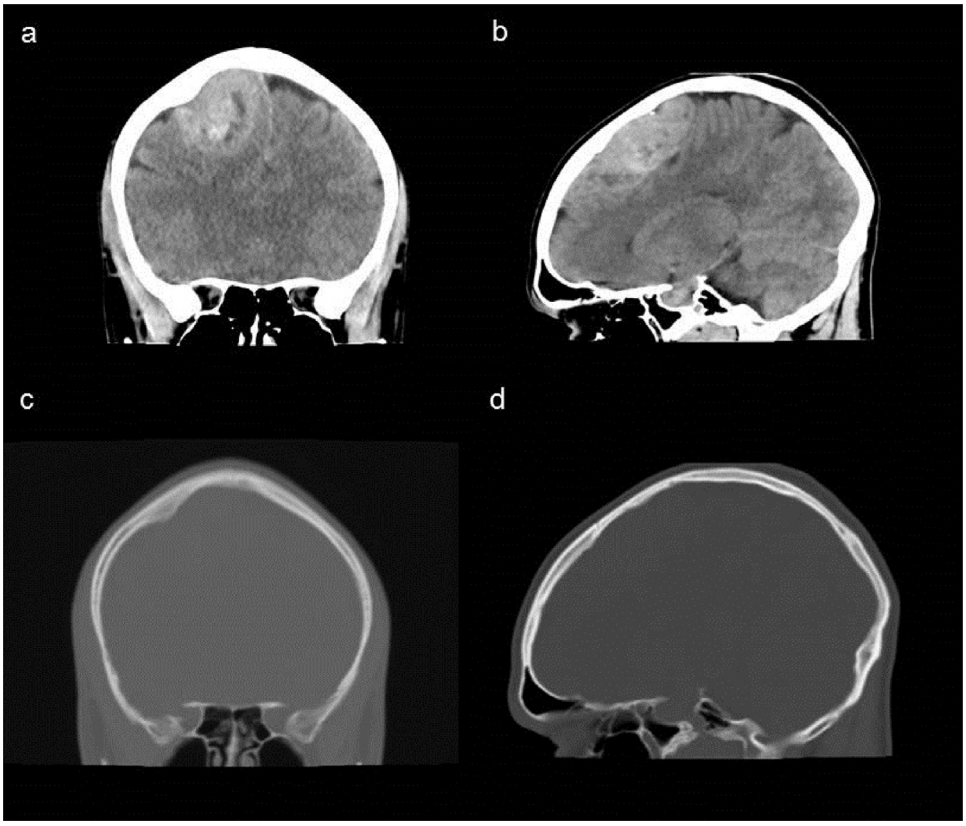

Fig. 1. Preoperative CCT.
a, b) Coronal and sagittal cranial CT with soft tissue imaging reveals space-occupying lesion in the right frontal lobe. c, d) Coronal and sagittal cranial CT with bone windowing showing a partial infiltration of the frontal bone.

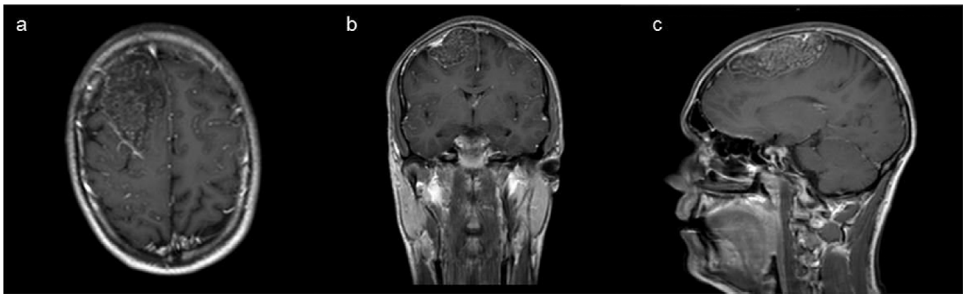

Fig. 2. Preoperative MRI.
a) Axial, b) Coronal and c) Sagittal T1-weighted gadolinium-enhanced imaging demonstrates only minimal and irregular contrast-enhancement of the lesion and possible dural attachment.

(chondroma[Title/Abstract] OR chondromatosis[Title/Abstract] OR enchondromatosis[Title/Abstract] OR "chondroma"[MeSH Terms] OR "chondromatosis"[MeSH Terms] OR "enchondromatosis"[MeSH Terms]) AND (“intracranial”[All Fields] OR "cranial"[All Fields] OR "cranium"[All Fields] OR intracerebral[All Fields] OR "cerebrum"[All Fields] OR "cerebral"[All Fields] OR "brain"[All Fields] OR meningeal [All Fields] OR "meninges"[All Fields] OR "skull"[All Fields] OR skull*[All Fields] OR cliv*[All Fields] OR convexity[All Fields]).

3. Results/Case presentation

A 25-year-old male patient was transferred to the neurosurgical department after a first-ever generalized seizure. Anticonvulsive therapy with levetiracetam had already been initiated at the transferring hospital. Other symptoms of raised intracranial pressure or mass effect such as headache or vomiting were not present. The neurological examination and laboratory tests, along with the electroencephalogram (EEG), were normal. A CT scan revealed a well-circumscribed supratentorial space-occupying lesion, round and hyperdense, in the right frontal lobe with 7 mm of midline shift. The lesion was partially calcified with infiltration of the frontal bone and there was a hypodense area in the tumor center. Intratumoral haemorrhage or cerebral edema were not evident (Fig. 1 a–d). CT angiography did not reveal any underlying vascular malformation. Magnetic resonance imaging demonstrated a clearly delineated tumor of 42 × 54 x 37 mm in size. The tumor was hypointense on T1-weighting imaging with minimal contrast-enhancement and possible dural attachment (Fig. 2 a–c). The T2-weighted images showed a mixed hypo- and hyperintense signal. The surrounding brain parenchyma was normal. There was no peripheral edema. A putative diagnosis of meningioma was established based on this comprehensive preoperative imaging. It was ultimately decided that the patient required operative management. The tumor was approached via a right-frontal osteoplastic parasagittal craniotomy, which allowed for the resection of the tumor in toto, along with the underlying