

# Intracerebral chondroma

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**Abstract:** Intracerebral chondroma is an extremely rare condition. A case of intracerebral chondroma with non-meningeal attachment is reported in a 25-year-old man with a long history of headache and recent seizure. Brain computed tomography and magnetic resonance imaging showed a large mass in the right frontal parasagittal convexity. The tumour was completely removed through a frontal craniotomy. Histopathology examination revealed a chondroma. (p73-75)

**Keywords:** Brain tumour, chondroma and cartilaginous tumour

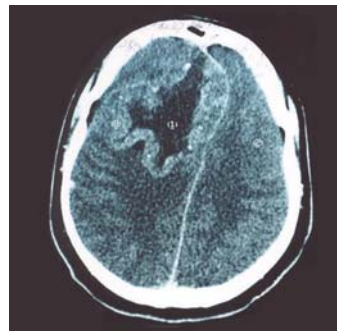
## Introduction

Chondromas are rare intracranial tumours with an estimated incidence rate of 0.2 - 0.3% of all intracranial tumours.<sup>2</sup> Most of them are located at the base of the skull and usually arise from the ligamentous tissue (syndesmoses).<sup>11</sup> Intracerebral or meningeal chondromas are exceedingly rare.<sup>14</sup> In this article, we present a case of intracerebral chondroma in the frontal parasagittal area. There was no attachment of the tumour to the dura matter or the falx cerebri. We review the clinical and radiological presentation of the tumour, its pathological features and its management.

## Case Report

A 25-year-old man was brought to a local hospital due to an episode of generalised seizure. The past history included episodes of headaches. Physical examination revealed bilateral papilloedema without focal neurological deficits; other clinical and neurological examinations were normal. Computed tomography (CT) scan showed a large mass in the right frontal area of about 9 x 7 x 5 cm. The tumour demonstrated a peripheral zone, with lower density in the centre. Microcalcifications were noted at the periphery of the mass. After contrast administration, there was ring-enhancement. There was no oedema but it had mass effect

on cerebral parenchyma and frontal horn of right lateral ventricle with no bone destruction or hyperostosis (Fig. 1).



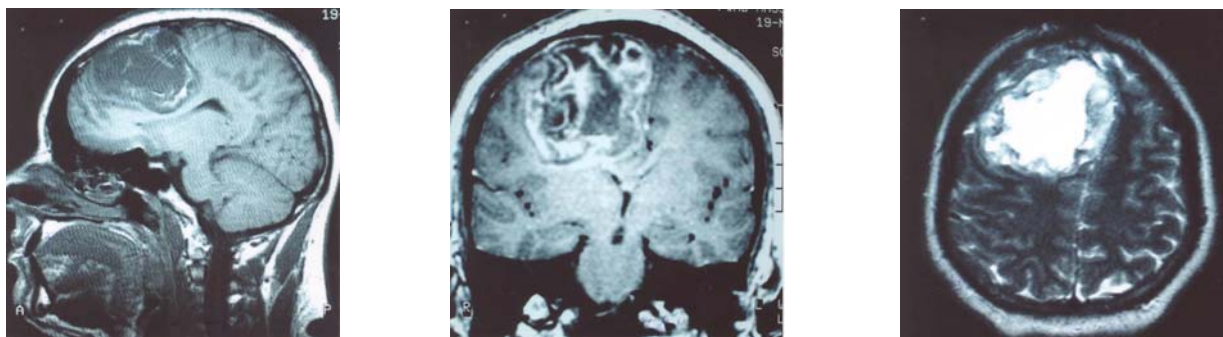
**Figure 1** - Axial post-contrast CT scan of brain. Tumour presents with a central hypodense area and hazy outline. Microcalcifications at periphery of the tumour are noted

Magnetic resonance imaging (MRI) of the brain showed a huge mass on the right frontal region. Mixed laminated high and low signal intensities of the mass were revealed on T1-weighted image (Fig. 2a), high signal intensity in the central area of the tumour was revealed on T2-weighted image (Fig. 2b). After intravenous contrast irregular enhancement of the tumour was noted (Fig. 2c). No precise diagnosis could be made on the basis of the MR images alone. Differential diagnosis included oligodendroglioma, teratoma and meningioma. A frontal craniotomy was performed, and the tumour was found to be approximately 0.5 cm subcortically. It was separated from the brain surface and was completely removed. It was noted that there was no attachment of the tumour to the falx cerebri or the frontal dura matter. The tumour was firm and lobulated in appearance, covered by a thin transparent capsula (Fig. 3). The postoperative course was unremarkable. Histologically, the lesion was composed of hyaline lobules of mature cartilaginous tissue containing chondrocytes with uniform nuclei, without atypia or mitotic activity confirming the diagnosis of chondroma (Fig. 4). The patient was doing

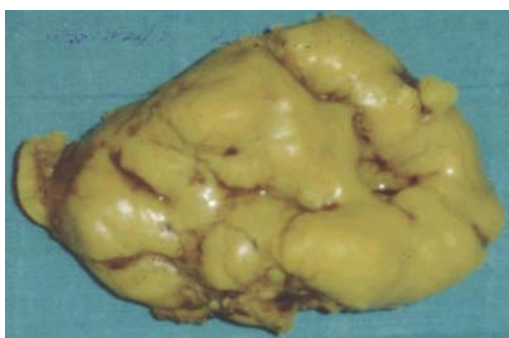
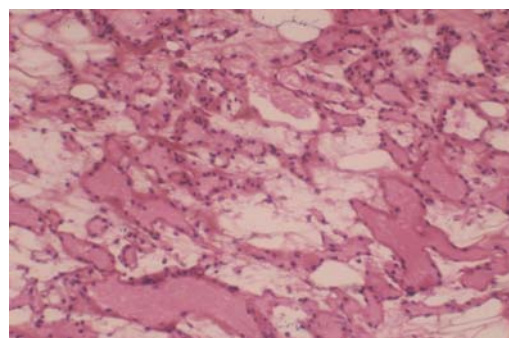
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**Figure 2** - MRI features of intracerebral chondroma:

a) Sagittal pre-contrast T1-weighted image. A giant mass in the frontal region, with mixed laminated high and low signal intensity b) Axial T2-weighted image shows high signal intensity in the central area of the tumour c) Coronal post-contrast. Irregular enhancement of the tumour

**Figure 3** - Specimen measured 9 x 7 x 5 cm and was firm and lobulated in appearance.**Figure 4** - Microscopic section shows nature hyaline cartilage with scattered chondrocytes. (HEx100)

well without any neurological deficits 14 months after tumour removal.

## Discussion

Intracranial chondromas are rare lesions. Most often they are intracranial-extradural in location, arising from the base of the skull, with a predilection for the sphenoid-ethmoid region.<sup>12</sup> Hirschfield first described intracranial chondroma in 1851. Approximately 70 - 85% of intracranial chondromas are extradural and arise from the skull base.<sup>9,15</sup> Skull base chondromas were reported in association with Ollier's disease and Maffucci's syndrome.<sup>3,16</sup> Approximately 15 - 30% of intracranial chondromas do not arise from the skull base and are intradural.<sup>8,10</sup> They are reported in the area of choroid plexus, sellar and parasellar or intracerebral, and attached to the dura matter (convexity or falx).<sup>6,17</sup> Attachment to dura, particularly over cerebral convexities included 70% of intradural chondroma and 15% of intracranial chondroma.<sup>10,13</sup> We found 51 cases of intradural benign chondromas in the literature.<sup>12</sup> Only 8 cases were located intracerebrally, including this report.<sup>15</sup> The origin of intracranial chondroma is not clear; many theories have been suggested. Skull base chondromas have been believed

to originate from embryonic crests of chondrogenic cells along baseline syndesmoses.<sup>2,5</sup> It is thought that intradural chondromas develop from heterotopic chondrocytes or metaplasia of other normal tissue, including meningeal fibroblasts or perivascular mesenchymal tissue.<sup>8,10</sup> Due to the non-invasive and slow-growing nature of chondromas, patients often present with a long-standing history of headache and symptoms of increased intracranial pressure. Patients may have signs and symptoms related to compression of adjacent structure, such as seizure, personality changes, and hemiparesis.<sup>9</sup> Despite paucity of symptoms, intracerebral chondromas are usually very large when diagnosed, which may be explained by their slow-growing nature and their common location in the frontoparietal area.<sup>1,14</sup> According to Lacerte, et al, intradural chondromas have two distinct CT scan presentations.<sup>10</sup> Type 1 (classical), is more common and reveals mixed density with minimal or moderate enhancement, whereas Type 2 is less frequent and has a central hypodense area, which is composed of cystic degeneration or of a very loose-texture connective tissue without necrosis in pathological evaluation. Tonohota, et al stresses that enhancement of chondromas increases after 30 minutes of contrast injection.<sup>15</sup> Magnetic

resonance imaging features have been reported in a few cases of intracranial chondromas. The tumour shows heterogeneous signal intensity, more hypodense on T1 spin echo scan and iso- to hyperintense on T2 spin echo scan. The tumour enhances minimally to moderately following administration of contrast.<sup>10</sup> In Type 2, the T2 spin echo scan shows a peripheral heterogeneous hypointense area and a well-demarcated hyperintense central area.<sup>9,10</sup> The former may enhance with contrast and show ring enhancement on T1 spin echo scan.<sup>9,10,13</sup> The latter does not enhance with contrast and its signal intensity in T2 spin echo scan may be explained by the very loose-texture oedematous connective tissue, as stated by Lacerte, et al with no perilesional oedema.<sup>8-10</sup> On angiography, chondromas present as an avascular mass.<sup>4,7</sup> Surgical resection is the treatment of choice for intracerebral chondroma and a total resection of tumour is usually possible as they are well-demarcated without parenchymal invasion, and its recurrence is rare after total resection.<sup>14</sup> If a benign, diagnosed chondroma shows rapid recurrence, invasion, or metastasis, chondrosarcoma should be suspected and the histology specimen should be reviewed for correct diagnosis.<sup>10</sup>

### Conclusion

Intracerebral chondromas are very rare benign cartilaginous tumours. Due to their slow-growing nature, clinical symptoms and signs are not initially prominent. They can be confirmed by imaging studies, and treatment of choice is total resection of the tumour.

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