



## Choroid Plexus Xanthogranuloma: Is it an Incidental Finding?

### *Koroid Pleksus Ksantogranülom: Tesadüfi Bir Bulgu Mu?*

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### Introduction

A woman aged 48 years presented with sudden onset tinnitus that improved after 2 weeks. She had no headache or hearing loss. Her general and neurologic examinations were normal. The patient was using venlafaxine 75 mg/day. Brain magnetic resonance imaging (MRI) performed to exclude intracranial pathologies, showed bilateral choroid plexus xanthogranulomas at the level of atrium of the lateral ventricles, which were hypointense on T1-weighted imaging, hyperintense on T2-weighted imaging and diffusion-weighted imaging (DWI) (Figure 1). The patient, whose symptoms improved, was informed about her xanthogranulomas and followed up without medical treatment.

Xanthogranulomas are benign tumors that consist of cholesterol clefts, lymphocytic infiltration, giant cells with multiple nucleoli, foamy macrophages (xanthoma cells), fibrous proliferation, and hemosiderin deposits. As one of the rarest lesions of the central nervous system, the incidence of xanthogranulomas on autopsy is reported as 1.6-7% (1).

The frequency of intraventricular tumors of the central nervous system is 10% and only 1% of this group contains lateral ventricle tumors, including astrocytomas and choroid plexus papillomas as the most common, and others including meningiomas, ependymomas, central neurocytomas, xanthogranulomas, and metastases (2).

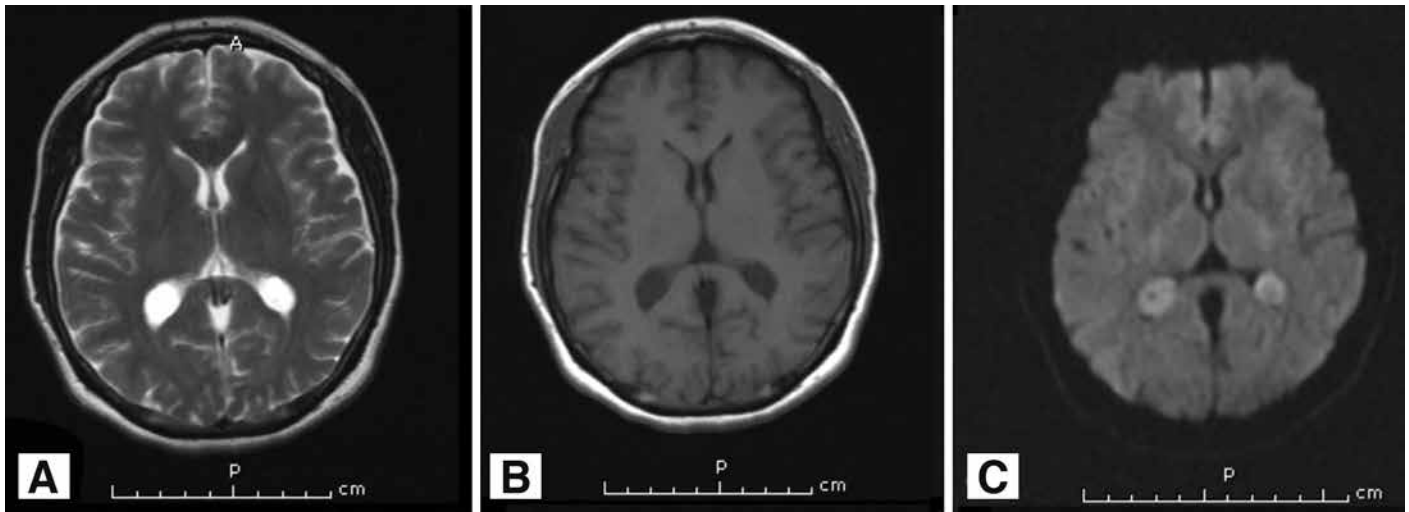
The mechanism is not well known but continuous proliferation of the choroid plexus epithelium, entrance of desquamated epithelial cells into the interstitium of the plexus by breaking the basal lamina and the walls of the tube, releasing lipids into the choroid matrix following destruction of lipid-loaded foam cells, lipid deposition in the epithelium, and stimulation of macrophages and multinucleated foreign-body giant cells by degenerated cells, which causes an increase in lipid deposition in the stroma of the plexus, are thought to be possible mechanisms. Also, arteriolar neogenesis and hemorrhages cause development of hemosiderin granules and deposition of these granules contribute to the pathology (3).

Xanthogranulomas have heterogeneous radiologic features because of their lipid and blood components. The diagnostic values of computed tomography (CT) and MRI are limited. CT can show ovoid, round-shaped (like colloidal cysts) or smooth-walled lesions and calcifications. They can be hypo, iso or hyperdense because of their heterogeneous components on CT. MRI cannot distinguish xanthogranulomas from other lesions of lateral ventricles including meningiomas, papillomas, ependymomas and arteriovenous malformations, because they can be cystic or solid. Due to outer cell lipid deposition, they can be hyperintense on T1-weighted imaging. Also, they can be hyperintense or isointense on T2-weighted imaging. Diffuse or rim-like contrast enhancement can be seen on MRI. The hyperintense appearance on DWI is the most

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**Figure 1.** Brain magnetic resonance imaging shows bilateral choroid plexus xanthogranulomas at the level of the atrium of the lateral ventricles, which were hyperintense on T2-weighted imaging (A), hypointense on T1-weighted imaging (B), and hyperintense on diffusion-weighted imaging (C)

important diagnostic feature (4). Acute infarctions of the choroid plexus are also hyperintense on DWI but they are unilateral, unlike xanthogranulomas.

Colloidal cysts are included in the differential diagnosis. They are often unilateral, located at the foramen of Monro, hyperdense on CT, and rarely show rim-like contrast enhancement. Due to their cholesterol component, they can be hyperintense (in 2/3 of patients) or isointense on T1-weighted imaging. Due to their water component, they are isointense on T2-weighted imaging. In addition, they do not show diffusion restriction on DWI, unlike xanthogranulomas (3). Choroid plexus papillomas that appear as papillary masses with intense contrast enhancement and calcification, and meningiomas showing contrast enhancement and arteriovenous malformations of the choroid plexus that present with hemorrhage should be included in the differential diagnosis.

Choroid plexus xanthogranulomas are often asymptomatic because of their small sizes but they can present with acute intraventricular hemorrhage, which can be fatal (5). Symptomatic patients often have xanthogranulomas located at the third lateral ventricle and may be complicated by intracranial hypertension symptoms caused by the blockage of the foramen of Monro or xanthomatous debris-induced aseptic meningitis or hemorrhage. They can be located in the Meckel cavity, pineal gland, cerebellopontine angle, bilateral cerebellum, sciatic nerve, petrous apex, paranasal sinus, and surroundings other than intraventricular localization. Asymptomatic patients such as our patient require no treatment but surgery or radiotherapy can be performed in symptomatic patients.

The mechanisms, differential diagnosis, imaging features, and treatment options of xanthogranulomas were evaluated on the basis of this reported patient in whom incidental asymptomatic

xanthogranuloma was discovered during the search for the etiology of tinnitus. A conservative approach in the investigation and treatment of xanthogranulomas and typical diffusion restriction pattern on DWI in the differential diagnosis is highlighted.

#### Ethics

Peer-review: Internally peer-reviewed.

#### Authorship Contributions

Concept: Selin Yetkinel, Semai Bek, Design: Selin Yetkinel, Semai Bek, Data Collection or Processing: Selin Yetkinel, Semai Bek, Analysis or Interpretation: Selin Yetkinel, Semai Bek, Literature Search: Selin Yetkinel, Semai Bek, Writing: Selin Yetkinel, Semai Bek.

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