

Neuroradiology / Neuroradiologie

Radiologic Manifestations of Colloid Cysts: A Pictorial Essay

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Abstract

Colloid cysts are among rare benign tumours of the third ventricle. Although the most frequent symptoms are headache and syncope, arrest hydrocephalus or sudden death could appear with colloid cysts. The aim of this pictorial essay was to increase awareness of the clinical presentation, computed tomography (CT) and magnetic resonance (MR) imaging spectrum, and treatment options of the colloid cysts. The data of 11 patients with histopathologically and/or clinically proven colloid cyst were analysed, retrospectively; and the neuroradiologic appearances of the cysts were evaluated. The CT and MR appearance of colloid cysts may change, depending on the viscosity or the cholesterol content of the cysts. However, the cystic content is the most important factor that could affect the success of treatment. Cysts that are especially rich in protein and cholesterol tend to be hyperdense on CT, hypointense on T2-weighted sequences and hyperintense on T1-weighted sequences. These cysts are viscous, and the success of aspiration is significantly low. In the diagnosis and evaluation of small-sized cysts that have an ingredient similar to cerebrospinal fluid, 3-dimensional sequences might be useful. The radiologic appearances of colloid cysts could play an important role in directing these patients to alternative surgical modalities, including resection.

Résumé

Les kystes colloïdes comptent parmi les tumeurs bénignes rares du troisième ventricule. Bien que les symptômes les plus courants des kystes colloïdes soient des maux de tête et des syncopes, ces kystes peuvent également entraîner l'hydrocéphalie ou la mort subite. Cet essai descriptif vise à mieux faire connaître le tableau clinique, les options de traitement et l'éventail d'images par résonance magnétique (IRM) et par tomographie par densité (TDM) liés aux kystes colloïdes. Une analyse rétrospective des données de 11 patients atteints d'un kyste colloïde prouvé par examen histopathologique a été menée et les manifestations neuroradiologiques évaluées. L'apparence des kystes colloïdes sur les examens d'IRM et de TDM peut varier selon la viscosité ou la concentration en cholestérol des kystes. Cependant, la composition du kyste est le facteur ayant la plus grande incidence sur la réussite du traitement. Les kystes ayant une teneur particulièrement élevée en protéines et en cholestérol ont tendance à être hyperdenses sur les examens de TDM, hypointenses sur les séquences pondérées en T2 et hyperintenses sur les séquences pondérées en T1. Ces kystes sont visqueux, aussi les chances de réussite de l'aspiration sont-elles extrêmement faibles. Des séquences en trois dimensions pourraient s'avérer utiles pour le diagnostic et l'évaluation de kystes de petite taille comportant une composition semblable au liquide céphalorachidien. Les caractéristiques radiologiques des kystes colloïdes pourraient jouer un rôle important dans l'orientation des patients vers d'autres types de chirurgie, y compris la résection.

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Key Words: Colloid cyst; Sudden death; Third ventricle; Computed tomography; Magnetic resonance imaging; 3-Dimensional; Aspiration; Brain neoplasm

Colloid cysts are rare intracranial lesions, which are usually localized at the anterosuperior portion of the third ventricle. Annually, the incidence is approximately 3 of 1,000,000 [1]. They compose 0.2%–2% of all intracranial pathologies, 15%–20% of all intraventricular tumours, and 55% of a third of ventricle masses [2,3]. These cysts could

cause acute hydrocephalus and cerebral herniation, and could lead to death. Therefore, they should be treated [1]. Histologic analysis of colloid cysts reveals an epithelial layer on the inside and fibrous capsula on the outside. Epithelium is usually characterized by mucin secreting or ciliated epithelia. Because this epithelium resembles respiratory epithelium, colloid cysts are thought to be embryologically originated endodermally rather than neuroepithelia [1].

Different surgical modalities have been described for their treatment, including simple shunt application, open surgeries, and percutaneous approaches (simple cyst

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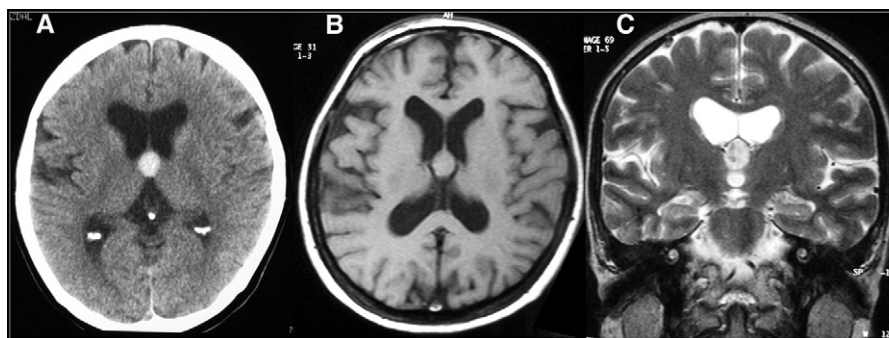


Figure 1. A 44-year-old female patient. (A) There was a 1.5-cm-diameter hyperintense lesion seen within the third ventricle in the neighbourhood of the foramen of Monro on computed tomographic evaluation. The cyst was hyperintense on T1-weighted (B), and isohypointense on T2-weighted images (C).

aspiration, stereotactic aspiration, and endoscopic procedures) [4]. The most important factor in determining the percutaneous approach is the viscosity of the cystic fluid. The radiologic appearance of the cysts is of a crucial importance in determining the most suitable treatment protocol and in prediction of the success of the treatment. In this study, we aimed to discuss the radiologic appearances of the colloid cysts in concordance with new sequences and high-Tesla MR devices. As far we know, there is no updated and detailed study in the literature.

Clinical Findings

Colloid cysts are known as rare mass lesions of the third ventricle. Although most of them are localized in the third ventricle, they rarely occupy the lateral ventricle, the fourth ventricle, or out of the ventricular system [5,6]. Their wall is usually homogenous, can be either elliptical or spherical; their size usually ranges from 3–40 mm, however, they might be larger. The size of the cyst is not a trustable prognostic factor because smaller cysts can lead to sudden death as well [7]. Most of the reported cases are seen between the third and fifth decades but can be seen during infancy and childhood as well. Although utmost, the cases are sporadic; there are at least 10 familial cases reported in the literature, which suggested an autosomal dominant penetration [8].

The major symptom that patients have is headache, which can be seen in 68%–100% of the patients [1]. Eight of 11 patients of our series had headache (73%). This symptom usually starts in the frontal area, is characterized by attacks that last for a short duration and changes with position. This headache is relieved by sleeping, which is different from space-occupying lesions [9]. Nausea and vomiting are usually associated with this headache [1].

Gait disturbance, temporary loss of consciousness, sudden weakness in extremities, blurred vision, dizziness, stroke, psychiatric problems, behavioral changes, dementia, and urinary-rectal incontinence are among less-frequent symptoms [10]. In children, the most frequent symptoms are headache, nausea and/or vomiting, papilloedema, and

diplopia [1]. Although colloid cysts are histologically benign, they could obstruct the foramen of Monro and lead to acute hydrocephalus [1].

Radiologic Properties

Both computed tomography (CT) and MR can be used in the radiologic diagnosis of colloid cysts. On CT, a major amount of colloid cysts is seen as hyperdense when compared with brain parenchyma (Figure 1). Rarely,

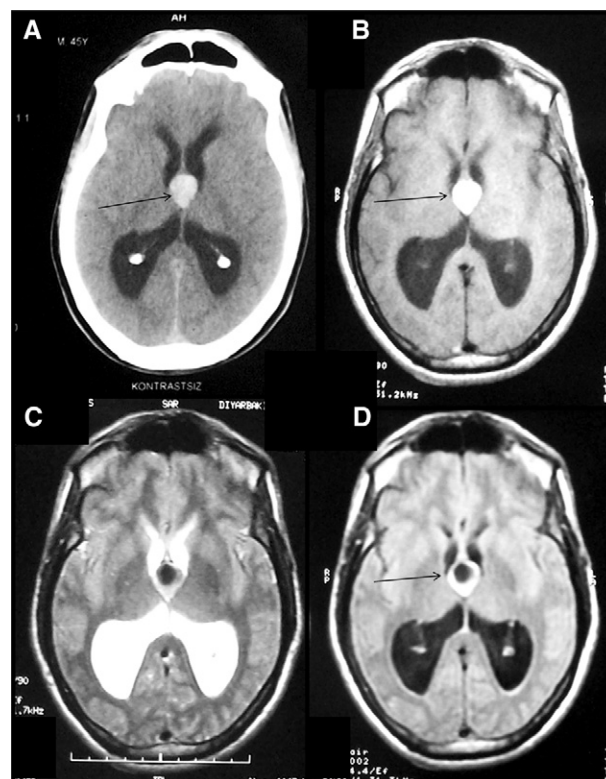


Figure 2. A 46-year-old male patient. (A) There was hydrocephalus and a 2-cm-diameter lesion hyperdense in appearance on axial computed tomographic evaluation, which was compatible with a colloid cyst (arrow). Although the lesion was hyperintense in axial T1-weighted images (B) (arrow), its centre was hypointense and the periphery was hyperintense on T2-weighted (C) and fluid-attenuated inversion recovery (D) images (arrow).

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