Pilocytic Astrocytoma of Fornix Mimicking a Colloid Cyst: Report of 2 Cases and Review of the Literature

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Key words
- Colloid cyst
- Fornix
- Misdiagnosis
- Pilocytic astrocytoma

Abbreviations and Acronyms
ADC: Apparent diffusion coefficient
CSF: Cerebrospinal fluid
CT: Computed tomography
MRI: Magnetic resonance imaging
PA: Pilocytic astrocytoma

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BACKGROUND: **Colloid cyst is a gelatin-containing cyst in the brain almost always found in the third ventricle. The specific shape and location of these cysts, a round well-delineated mass in the rostral part of the third ventricle adjacent to the foramen of Monro, on imaging are the main findings for diagnosis. Several masses of the third ventricle masquerading colloid cysts on images have been reported. Based on different surgical approaches, preoperative misdiagnosis of colloid cyst may have great impact on prognosis.**

METHODS: **We report 2 cases that presented with severe headache and hydrocephalus, and their preoperative images were highly indicative of colloid cyst.**

RESULTS: **Histopathologic investigations after tumor resection showed pilocytic astrocytoma of fornix in both cases.**

CONCLUSIONS: **Fifteen cases of colloid cyst misdiagnosis with other masses have been reported thus far; among them, 2 cases were pilocytic astrocytoma. In this study we report 2 other cases. Furthermore, we discuss additional clues helping to differentiate pilocytic astrocytoma from colloid cyst on images.**

INTRODUCTION

Intraventricular tumors are rare lesions, known for their deep location and the potential risk of obstructive hydrocephalus.[1] Among these lesions, ones located adjacent to Monro foramina are more associated with severe hydrocephalus and cerebral herniation.

The differential diagnosis of a mass near the intraventricular foramen is wide and includes colloid cyst, meningioma, astrocytoma, xanthogranuloma, metastatic lesions, neurocysticercosis, neurocytoma, ependymoma, subependymoma, and so forth.[2,3] Among these lesions, colloid cyst is the only one that mostly occurs adjacent to Monro foramina, whereas other pathologies are uncommonly found in this location.[4]

Colloid cyst, the most common third ventricular tumor, appears as a well-defined mass in the rostral part of the third ventricle on imaging, with varying density and signal intensity on computed tomography (CT) scan and magnetic resonance imaging (MRI), respectively.[4,5] Therefore, it usually will be considered as the first diagnosis for a mass located near the Monro foramina independent of its density on CT scan and signal intensity on MRI. Based on different surgical approaches, preoperative misdiagnosis of colloid cyst may have great impact on prognosis.

To our knowledge, 15 cases of colloid cyst misdiagnosed with other masses have been reported thus far (Table 1). Two of the reported misdiagnoses were cases of pilocytic astrocytoma (PA), and in this study we report 2 other cases of PA with presurgical images highly indicative of colloid cyst.

MATERIAL AND METHODS

Case 1

Case 1 was a 21-year-old woman referred to our clinic for severe headache and hydrocephalus. CT scan revealed a well-defined isodense lesion with hypodense core located in the rostral part of the third ventricle (Figure 1A). T1-weighted MRI displayed hyperintense mass related to gray matter, adjacent to the foramen of Monro, without enhancement after contrast administration (Figures 1B and D). T2-weighted MRI showed isointense mass with hypointense core related to gray matter (Figure 1C). The location and signal characteristics of the lesion were highly suggestive of colloid cyst, but after craniotomy, after entering the lateral ventricle through the middle frontal gyrus, we encountered a bulged fornix. Excisional biopsies were done, and pathologic examination revealed PA of fornix. The patient's postoperative magnetic resonance images are displayed in Figure 2. Pre- and postoperative sagittal images are displayed in Figure 3. Postoperation follow-up revealed no significant complication.

Case 2

Case 2 was a 12-year-old boy who was admitted to the neurologic department of our hospital in April 2015. His chief complaint was progressive headache, which continued for 2 weeks and was

Table 1. Literature Review of 15 Cases of Presurgical Misdiagnosis of Colloid Cyst

Postoperative Diagnosis	Study
Pilocytic astrocytoma	Missler et al., 2009[5] (n = 2)
Pilomyxoid astrocytoma	Yaakup et al., 2009[6] (n = 1)
Neurocysticercosis	Gupta et al., 2002[7] (n = 1)
	Wray et al., 2001[8] (n = 1)
	Meneses et al., 1996[9] (n = 1)
	Couldwell et al., 1995[10] (n = 1)
Lung metastasis	Hazman et al., 2008[11] (n = 1)
	Okutan et al., 2006[12] (n = 1)
Choroid plexus metastasis	Leach et al., 2004[13] (n = 2)
Single brain metastasis	Lazzarino et al., 1987[14] (n = 1)
Xanthogranuloma	Tatter et al., 1994[15] (n = 2)
Meningioma	Lee et al., 1979[16] (n = 1)

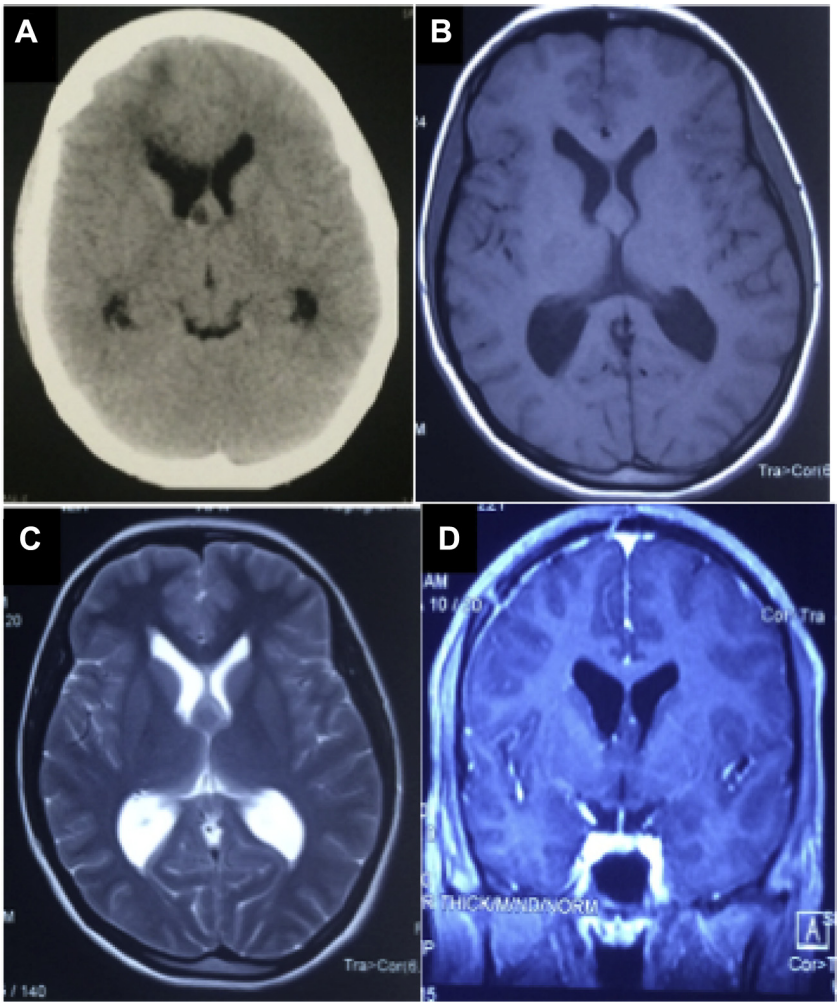

Figure 1. Preoperative images. (**A**) Axial computed tomography image. (**B**) Axial T1-weighted image. (**C**) Axial T2-weighted image. (**D**) Coronal postgadolinium magnetic resonance image.

accompanied with nausea, vomiting, and blurred vision. MRI depicted a well-circumscribed mass located in the rostral part of the third ventricle, the typical location of colloid cyst. The lesion appeared homogenously iso- to hypointense on T1- and T2-weighted images related to the gray matter with enhancement after contrast administration (Figure 4). Based on these findings, our presurgical diagnosis was colloid cyst. Endoscopic surgery was performed, and histopathologic examination after biopsy showed PA (World Health Organization grade I) of fornix. The patient's postoperative magnetic resonance images are shown in Figure 5.

DISCUSSION

Colloid cyst comprises less than 2% of all intracranial lesions and most commonly presents in the age range of 20–50 years.[4,17-19] Colloid cyst is considered a slow-growing congenital cyst, which originates commonly from the roof of the third ventricle behind the foramen of Monro. These cysts attach to the ventricular wall by a pedicle and form a pendular structure, and when they enlarge sufficiently they may cause intermittent obstructions of foramen of Monro, resulting in its classical short-lasting intermittent headache.[17,19,20] Other neurologic symptoms related to mass effect may occur, including visual disturbances, memory loss, normal-pressure hydrocephalus, and even sudden death.[4,21] Colloid cysts may present as very large cysts not confined to the third ventricle space and extending far from the roof of the third ventricle through anatomic windows existing between fornices. These large colloid cysts seem to originate from the sites sufficiently far from the interventricular foramen, allowing them to reach very large size without causing significant symptoms.[20]

There are several other masses that should be mentioned as differential diagnosis of an intraventricular mass, including pituitary adenoma, craniopharyngioma, papilloma of the choroid plexus, hamartoma, ganglioglioma, gangliocytoma, sarcoidosis, tuberculosis, and PA.[2,3] Nevertheless, imaging characteristics of colloid cyst make it the first diagnosis of a mass at this location. Our search in the