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Case Report

A Familial Case of Spontaneous Regression of Colloid Cyst of the 3rd Ventricle on Magnetic Resonance Imaging

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ABSTRACT

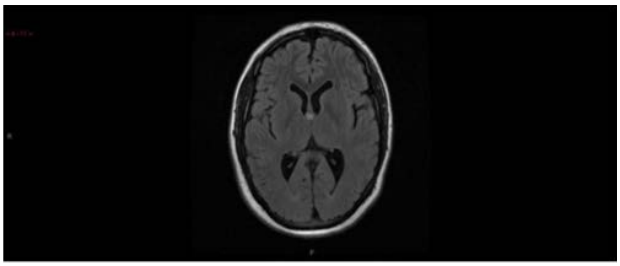
A 21-year-old male underwent screening for a positive family history of colloid cyst with an MRI scan. This suggested a lesion in the region of the roof of his 3rd ventricle which was confirmed on a computerized tomography (CT) scan as a colloid cyst measuring 6 mm. Seven-years before his evaluation, the patient's father was found to have an approximately 20 mm colloid cyst with acute hydrocephalus for which he underwent excision. His sister suffered a sudden death at the age of 25. The cause of death was confirmed on autopsy as a colloid cyst which was undiagnosed and associated with acute hydrocephalus. At the time of evaluation, the patient was asymptomatic. On serial imaging in 1-year, there was a definite increase in size of the colloid cyst which now measured 8 mm along its maximum dimension. The colloid cyst also changed in signal intensity appearing more hyperintense on T2-weighted images and fluid-attenuated inversion recovery (FLAIR) sequence. A serial magnetic resonance imaging (MRI) was performed in 18-months as a part of ongoing surveillance with neuroimaging following the first presentation. This demonstrated a decrease in size and change in the shape of the colloid cyst, measuring 5 mm in maximum dimension, with associated decrease in ventricular size and resolution of hydrocephalus suggesting some spontaneous rupture of the colloid cyst. A CT head with unenhanced volume acquisition of the head demonstrated residual partially international organization for standardization (ISO), partially hyperdense colloid cyst seen at the foramen of Monro. This confirmed the findings of MRI with a decrease in size of residual colloid cyst measuring approximately 5 mm in maximal diameter with no residual hydrocephalus.

Keywords
Neuroradiology; Central nervous system cysts; Colloid cyst; Magnetic resonance imaging; Third ventricle; Foramen of Monro.

INTRODUCTION

Colloid cysts of the third ventricle are histologically benign epithelial lined tumours, characteristically located in the foramen of Monro. The incidence of this lesion is 3.2 per million per year, making up to 0.5 to 2% of all intracranial tumours. Majority of cases present between second and fourth decades of life. Sixty percent of colloid cysts are found incidentally and are asymptomatic. Of the remaining minority of 40%, the most common presenting complaint is headache as a sequelae of hydrocephalus. The development of hydrocephalus can be attributed to their position in the roof of third ventricle in close proximity to the foramen of Monro. This results in obstructive hydrocephalus resulting in sudden thunderclap headache. Other reported symptoms are nausea/vomiting, blurred vision or diplopia, dizziness or ataxic gait, cognitive decline, syncope, and sudden death due to untreated hydrocephalus and raised intracranial pressure (ICP).[1] The natural history of colloid cyst of the third ventricle is widely variable and depends on patient demographic characteristics, presenting symptoms, and cyst diameter. Incidental lesions in asymptomatic patients are managed with serial imaging. 8.8% of these incidentally discovered lesions enlarge. The lesion appears as a well-delineated hyper attenuated mass on non-enhanced computerized tomography (CT). On magnetic resonance imaging (MRI) it appears isointense to hyperintense on T1-weighted images and hypo intense to hyper intense on T2 sequences (Figure 1). It is difficult to recognize colloid cysts with fluid-attenuated inversion recovery (FLAIR) sequence, which are hypointense on T2-weighted evaluations; however, they have been reported to appear similar to attenuated cerebrospinal fluid (CSF) on FLAIR.[2]

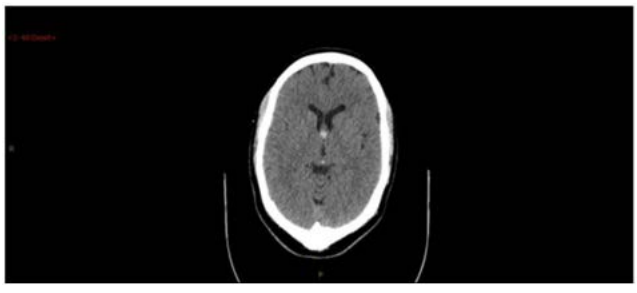
Figure 1. *A Colloid Cyst Measuring Approximately 8 mm along its Maximum Dimension. Appears Hyper Intense on T2-weighted Images and FLAIR Sequence*



CASE PRESENTATION

A 21-year-old male underwent screening for a positive family history of colloid cyst with an MRI scan. This suggested a lesion in the region of the roof of his 3rd ventricle which was confirmed on a CT scan as a colloid cyst measuring 6 mm with no associated hydrocephalus (Figure 2). Seven-years before his evaluation, the patient's father had presented with headache and confusion and was found to have an approximately 20 mm colloid cyst with acute hydrocephalus for which he underwent excision. His sister suffered a sudden death at the age of 25. The cause of death was confirmed on autopsy as a colloid cyst which was undiagnosed and associated with acute hydrocephalus. She had suffered from intermittent headaches associated with some confusion for many months, and over a 4-day period, she developed severe headache following which she attended accident & emergency department (A&E) and was sent home with a suspected urinary tract infection (UTI). She died at home whilst lying on the couch 4-days later. At the time of evaluation, the patient remained well with no history of headaches, dizziness, any cognitive deterioration, vomiting, balance impairment or seizures.

Figure 2. *CT Demonstrating a Colloid Cyst Measuring 6 mm with a Hyper Dense Focus in the Superior Portion of the Third Ventricle. There is No Evidence of Obstructive Hydrocephalus.*



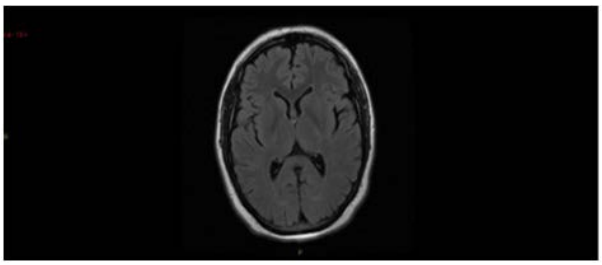
On serial imaging in 1-year, there was a definite increase in size of the colloid cyst which now measured approximately 8 mm along its maximum dimension. The colloid cyst also changed in signal intensity on comparison with previous scan appearing more hyperintense on T2-weighted images and FLAIR sequence. There was a slight increase in size of the lateral ventricles on comparison with previous scan. A neuropsychology assessment concluded that no notable cognitive dysfunction. An early surgical intervention was suggested on the rationale of changes in the density of the cyst, the morphology, the size of the ventricles and the strong family history. The patient remained clinically well through this period. A serial MRI was done in 18-months as a part of ongoing surveillance with neuroimaging.

This demonstrated a decrease in size and change in the shape of the colloid cyst, measuring 5 mm, with associated decrease in ventricular size and resolution of hydrocephalus suggesting some spontaneous regression of the colloid cyst. A CT head with unenhanced volume acquisition of the head demonstrated residual partially international organization for standardization (ISO), partially hyper dense colloid cyst seen at the foramen of Monro. This confirmed the findings of MRI with a decrease in the size of residual colloid cyst measuring 5 mm with no residual hydrocephalus.

OUTCOME

In the context of rare phenomenon of reduction in size, the risks of surgery for the small remnants of the cyst were disproportionately high in relation to the risk from the cyst. Surgery was deferred and a follow-up MRI imaging was done in 8-months which demonstrated a small colloid cyst at the size of 4 mm (Figure 3). Further CT imaging was not done given the age of the patient and potential risks of radiation. The patient remained well.

Figure 3. *A Solitary Focus of T2/FLAIR Hyper Intensity in the Sub-cortical White Matter of the Left Frontal Lobe Appears Smaller than Previous. There is a Normal Appearance of the Ventricular System.*



CONCLUSION

Familial cases of these lesions is extremely rare.[3,4] There is a lack of evidence on the role of genetic factors in the development of these lesions. Insights into the function of "paired"-like homeodomain transcription factor (Prop1) in the development of Rathke's pouch, the pituitary primordium, have been described in mice. The projections of these concepts into human genetics and pathophysiology have not been studied thoroughly.[5] The mechanism for reduction in size remains uncertain, however, there have been reports of spontaneous regression mostly in children and asymptomatic adults.[6-9]

LEARNING OUTCOME

It is important to remember that colloid cyst although rare is an important differential diagnosis of hyper attenuated mass on non-

enhanced CT, particularly in the region of foramen of Monro. However, there are reports of colloid cysts at unusual locations such as lateral ventricle and posterior fossa. The main challenge in diagnosis remains late presentation and sudden death due to hydrocepahlus. Differential diagnoses include other masses arising in the region of foramen of Monro like meningioma, glioma, metastasis and blood in the region. There should be a low threshold for imaging in patients with a family history of colloid cyst of the third ventricle.

CONSENT

The authors have received written informed consent from the patient.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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