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Choosing between endoscopic or microscopic removal of third ventricle colloid cysts

Ghani Haider, Altaf Ali Laghari, Muhammad Shahzad Shamim

Abstract

Colloid cysts are benign lesions, found in the anterior part of the roof of the third ventricle. A PubMed search of literature was performed to identify the evidence on different treatment options and surgical approaches for removal of colloid cysts. Evidence on endoscopic versus microsurgical resection of colloid cysts showed that microsurgical approach had significantly higher rates of gross total resection, lower recurrence rate and lower re-operation rate. No significant difference with respect to the mortality rate or the need for a shunt was found between the two groups. However, the overall morbidity rate was lower for the endoscopic group.

Keywords: Colloid Cyst, Central Nervous System, Third Ventricle.

Introduction

Colloid cysts account for 0.5%-2% of all intracranial tumours.^{1,2} Typically diagnosed in the 4th or 5th decade of life, they are found equally in men and women.^{2,3} Cysts larger than 10mm in diameter may become symptomatic by virtue of obstructing CSF flow and causing hydrocephalus, and instances of sudden death have also been reported.¹⁻⁴ Magnetic Resonance Imaging (MRI) is the gold-standard diagnostic test for third ventricular colloid cysts, and whenever the cysts are symptomatic, or larger than 10mm, some form of treatment is warranted. Different strategies have been described in treating patients with colloid cysts. In this review, the authors will describe the available evidence for some of the more popular forms of treatment of colloid cysts.

Review of Evidence

Although surgical removal of cyst is the preferred treatment choice, various other treatment options, and various surgical approaches have been described, and debated.²⁻⁵ Stereotactic aspiration or drainage of cyst contents was a minimally invasive approach but it has fallen out of favour due to the high rate of recurrence.^{5,6}

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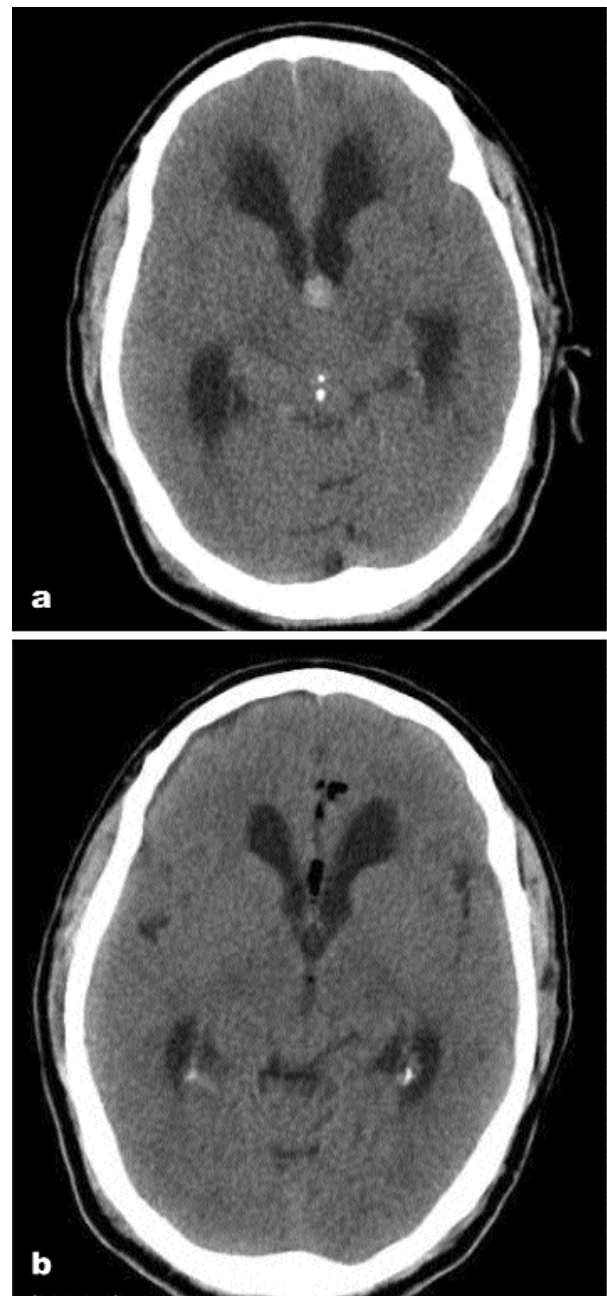


Figure-1: a) Pre-operative plain CT scan showing colloid cyst and hydrocephalus. b) Post-operative plain CT scan of the same patient showing removal of cyst and resolution of hydrocephalus.

Moreover, it is not always possible due to the variations in cyst contents. CSF diversion procedures can be carried out but since the cyst typically blocks the foramen of Monroe, the treatment would require drainage of both lateral ventricles either through two catheters, through a strategically placed catheter, or through a unilateral catheter with a septum pellucidotomy. Moreover, it is associated with shunt dependency and a shunt has its own set of risks and complications. Craniotomy with a trans-cortical or a trans-callosal approach were the mainstay of treatment for some time but have been recently lost out to more minimally invasive microsurgical methods. Common microsurgical approaches include trans-cortical trans-ventricular, or a trans-callosal route, although other approaches have also been described in large series.⁷

There has been a discussion with regards to the superiority of either microsurgical or endoscopic methods for the treatment of colloid cysts.^{1,2,5,6} The endoscopic approach requires a smaller opening and corticotomy, and arguably, offers much better visualization. However, a large systematic review and meta-analysis of 1278 patients conducted in 2014, comparing endoscopic to microsurgical resection of colloid cysts showed that microsurgical approach was found to have significantly higher rates of complete cyst removal, lower rates of recurrence and re-operation. There was no significant difference with respect to the mortality rate or subsequent requirement of a shunt. However, the overall morbidity rate including seizures, infections, memory deficits and venous infarction was lower for the endoscopic group.² Both techniques can potentially benefit from the accuracy of neuro-navigation. It is also reported that the rates of complete removal of cyst using endoscopic methods are improving, which may be due to the learning curve associated with new technology, as well as technological advances such as the use of tubular retractors and endoscopes with multiple working channels.^{1-3,5} Robot-controlled endoscopy may be another promising avenue.⁶ Endoscopic resection has also been supported as a preferred treatment option for asymptomatic, incidental colloid cysts.^{4,8} More recently,

an antero-lateral endoscopic approach with dual instrument technique, has been reported with good results.⁹ Each technique has its own set of strengths, limitations and possible complications; results are dependent on the complexity of the case and familiarity of the surgeon to the procedure.

Conclusion

Many approaches are available for removal of colloid cysts with their own strengths and limitations. By and large, the surgical treatment of colloid cysts regardless of approach remains safe and effective. The choice of approach should be based on patient's unique anatomy, size of ventricles, position of cyst, availability of resources and surgeon's expertise. Although no single approach can be stated as the best for every case, based on author's review of literature, the paradigm is shifting towards endoscopic approach.

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