



COLLOID CYSTS OF THE THIRD VENTRICLE: A REVIEW OF SIXTEEN CASES

Neurosurgery

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ABSTRACT

BACKGROUND : Colloid cysts are one of the rare brain tumours and are mostly located in the anterosuperior portion of the third ventricle, between the fornix and surround of Foramen of Monroe.

OBJECTIVES:

- 1.To review the demographic information & analyse clinical manifestations of patients presenting with colloid cyst of third ventricle.
- 2.To analyze the advantages and disadvantages of various surgical approaches
- 3.To assess the surgical outcome in colloid cyst patients operated by any method.

MATERIALS AND METHODS: A retrospective study was performed on 16 patients who presented with a colloid cyst and underwent surgery at the Department of Neurosurgery, King George Hospital, Andhra Medical College between 2013-2018. They were evaluated based on clinical findings and imaging features, surgical approaches used for resection and their outcomes.

RESULTS: Sixteen cases of colloid cyst of the third ventricle were operated upon between 2013-2018. There were seven male and nine female patients with their ages varying between 9 and 62 years old. Nine patients were operated on by using a transcortical trans-ventricular approach, four using the anterior trans-callosal approach and, three patients by using an endoscopic approach. In all patients, complete excision of the lesions was achieved.

CONCLUSION: Colloid cysts, though benign, present surgical challenges because of its deep midline location. Complete excision of the colloid cyst carries an excellent prognosis. Surgery is a safe and effective treatment option for this benign lesion.

KEYWORDS

Colloid cyst, endoscopic approach, third ventricle, transcallosal approach, transcortical approach.

INTRODUCTION

Colloid cysts are rare congenital and benign intracranial lesions, usually occurring in the anterior and antero-superior part of the third ventricle^{1,2}. In rare instances the colloid cysts may be found more posteriorly and may obstruct the posterior segment of the third ventricle. These third ventricular colloid cysts constitute about 0.5 to 1% of all intracranial tumors. The cysts may cause obstruction of the Foramen of Monroe and due to impeded Cerebrospinal Fluid (CSF) flow; thus leading to hydrocephalus with lateral ventricle dilatation. The cysts are believed to be derived from either primitive neuroepithelium of the tela choroidea or endoderm.⁴ The wall of a colloid cyst usually consists of a single layer of columnar epithelial lining. The colloid cyst is an epithelial lined cyst filled with gelatinous material which commonly contains, mucin, old blood, cholesterol, and ions⁵. Clinical presentation is varied. Some cases of colloid cyst may be detected as an incidental finding when imaging studies were performed for some other reason. In recent times the detection of these incidental colloid cysts is on the rise due to increased availability of CT and MRI scans. The management of incidental colloid cysts is a topic of debate. The growth rate of these cysts cannot be predicted and whether these incidentally detected colloid cysts become symptomatic or not is of doubtful significance. In others the patients may present with non-specific symptoms like headache, vertigo or the symptoms may be related to raised ICP, which depends on the rate of development of hydrocephalus⁵. Patients with colloid cysts larger than 1.5cms should be considered for surgical excision, as these cysts are more likely to become symptomatic¹². In symptomatic individuals the frequently observed symptoms were headaches and symptoms of raised intracranial hypertension like visual disturbances, seizures and drop attacks.⁵ Sudden deaths are found to be associated with acute hydrocephalus or cardiovascular failure due to abrupt disturbance in hypothalamic function.² Symptomatic cysts should be treated with surgical resection. Third ventricular colloid cysts can be resected using conventional microsurgery (MS) (transcortical MS or transcallosal MS) or with endoscopic surgery (ES).³

AIMS AND OBJECTIVE

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MATERIALS AND METHOD

Sixteen cases were treated from Jan 2013 – August 2018 at the Department of Neurosurgery, King George Hospital, Visakhapatnam with the diagnosis of colloid cyst. A retrospective analytical study was performed. The follow up period for these cases was between 6 months to 1 year. Patients underwent surgery based on the size of the cyst (cut off size 1.5cms), symptoms of the patient and location of the cyst. Small size cyst up to size of 2 cm were operated by endoscopic route. In the presence of hydrocephalus, transcortical approach was used. Without hydrocephalus transcallosal approach was used. Data was collected and analysed regarding the demographic information, preoperative symptoms and signs, the different surgical approaches used in the management of these cases and postoperative complications like infection, post-operative hydrocephalus. All patients underwent radiological workup both preoperatively and post operatively by using either brain CT and MRI. Advantages and disadvantages of these three surgical approaches were compared and analyzed.

OBSERVATIONS & RESULTS

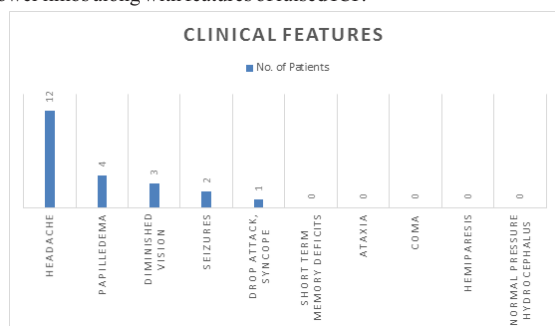
Demographics

The surgical database at the King George Hospital, Visakhapatnam was retrospectively reviewed for all patients undergoing operation for colloid cysts. The study was conducted on 16 patients, of which 7 (43.75%) were male and 9 (56.25%) were females. Colloid cysts were reported in all ages. The age of the patients in our present study varied

between 9 years to 62 years. Majority of the patients were in the third decade of life (7 out of 16 = 43.75%)

Clinical Features

The presentation of the patients varied. Some of the patients were asymptomatic where the colloid cyst was an incidental finding in imaging done for some other unrelated reason. In the present study two cases were belonging to this group. In symptomatic patients the various clinical symptoms ranged from headache, visual disturbances, seizures and drop attacks. Headache was the most common clinical symptom, occurring in 75% of patients. One classic presentation of this headache is the postural nature where the headaches are more severe in recumbent position. This is explained by the ball valve mechanism which implies a movable mass that dislodges from the foramina when the patient is recumbent. Intermittent obstruction and disimpaction of the cysts in the third ventricle is the cause for these paroxysmal attacks. In others the headache was generalized, intermittent, and was often accompanied by vomiting. The duration of clinical complaints at the time of presentation varied from 1 day to 1 year. One patient reported loss of consciousness for about 30 mins indicating drop attack. This is due to sudden onset of weakness of lower limbs along with features of raised ICP.



Route of Surgery

The rationale for selection of the route of surgery was the size of the cyst less than or more than 2 cms and the presence or absence of hydrocephalus. Complete surgical excision of colloid cyst was performed in all patients under study. The various surgical approaches adopted are enumerated in below table. None of the patients were pre-operatively shunted.

Route of Surgery	No. of Patients
Transcortical	9 (56.25%)
Transcallosal	4 (25%)
Endoscopic	3 (18.75%)

Complications

Post-surgical complications were observed in 5 patients. Complications varied for different approaches. Complications included hemiparesis, aseptic meningitis in the transcortical group, hydrocephalus in the transcallosal group and intracerebral hematoma in the endoscopic group. However, none of the patients within the study group had seizure episodes in post-operative period. The presenting complications are enumerated in Table below.

Transcortical Approach

Transient hemiparesis was observed in 2 patients undergoing surgery using transcortical approach. While it was resolved in one patient within 15 days, in another patient it was resolved within 3 months of follow-up with medical management. One patient presented with fever and was diagnosed with aseptic meningitis during follow-up within one month from the surgery and was treated conservatively and the patient later recovered.

Transcallosal Approach

One patient among four cases operated via transcallosal approach had developed hydrocephalus on the 2nd post operative day and External ventricular drainage was placed in that case. No other complications were observed in patients treated with transcallosal surgical approach.

Endoscopic Approach

The condition of one patient among three patients who were operated via the endoscopic approach deteriorated post-operatively. The scan in that patient showed presence of intracerebral hematoma, which was evacuated on emergency basis. This patient had a protracted course of hospital stay but ultimately had recovered.

Complications	Transcortical	Transcallosal	Endoscopic
Hydrocephalus	-	1	-
Infection	-	-	-
Neurological deficits- Hemiparesis	2	-	-
Intracerebral Hematoma	-	-	1
Others (Aseptic meningitis)	1	-	-

Length of Hospital Stay

The Endoscopic approach had the least among the three approaches in terms of number of days of ICU as well as hospital stay. The number of days of stay in the ICU and hospital are compared in the table below.

Stay in Hospital	Transcortical	Transcallosal	Endoscopic
ICU stay (days)	4.56 ± 1.13	4.75 ± 2.28	2.67 ± 1.79
Ward stay (days)	8.23 ± 1.56	8.00 ± 1.60	5.33 ± 1.53

Surgical Outcomes

Out of a total of 16 patients, 9 were operated through transcortical route in which, 8 showed improvement out of these 8 improved cases two cases had developed transient hemiparesis but had improved with medical management. Among the 9 cases operated via transcortical route the condition of one patient had worsened due to aseptic meningitis. Of 4 patients operated through transcallosal route, all 4 showed improvement while condition of one patient worsened initially due to the development of hydrocephalus for which external ventricular drainage had been done and he ultimately improved. Of the 3 patients treated endoscopically, 2 showed improvement while one patient had developed intracerebral hematoma after the endoscopic procedure for which emergency evacuation of the hematoma was done and he had improved in due course of time.

Neurological Outcomes	Transcortical (n=9)	Transcallosal (n=4)	Endoscopic (n=3)
Improvement	8	3	3
Unchanged	0	1	0
Worsened	1	0	0
Death	0	0	0

DISCUSSION

The controversial origin, benign histology, varied clinical presentation, and the variety of possible routes of approaches in the surgical management of colloid cysts have often generated interest in neurosurgeons around the world.

Male sex predominance was documented in the study group of Mathiesen et al⁶ and Nitta and Symon series.⁷ Camacho et al⁸ found no sex difference in their large series from Mayo Clinic. Our present series also has no significant sex predilection.

There was no specific age group predominance in any of these series; however, in our series more than 75% of patients were between 10 to 50 years of age with the highest incidence in the third decade of life.

The most prominent common presenting symptom was headache, followed by visual disturbances and seizures. Most of the patients in the present series were operated via transcortical approach.

In Gokalp et al⁹ series of 28 patients operated micro-surgically, they observed two instances of postoperative epilepsy. One of the patients died due to development of intracerebral haematoma. So, the incidence of epilepsy in their series was 3.5%. In our series, no cases had post-operative seizure episodes.

In Robert S. Heller et al series of 39 patients, one patient developed transient hemiparesis. In our series, 2 patients developed transient hemiparesis. They recovered with medical management and had improved on subsequent follow-up.¹⁰

In Eric. M Horn et al series, patients treated via endoscopic approach had mean ICU stay of 2.3 ± 0.4 days and hospital stay of 5.4 ± 1.3 days, while those operated via transcallosal approach had mean ICU stay of 3.3 ± 0.6 days and hospital stay of 6.3 ± 0.8 days. In our series, patients treated via endoscopic approach had mean ICU stay of 2.67 ± 1.79 days and hospital stay of 5.33 ± 1.53 days, while those operated via transcallosal approach had mean ICU stay of 4.75 ± 2.28 days and hospital stay of 8.00 ± 1.60.¹¹

CONCLUSION

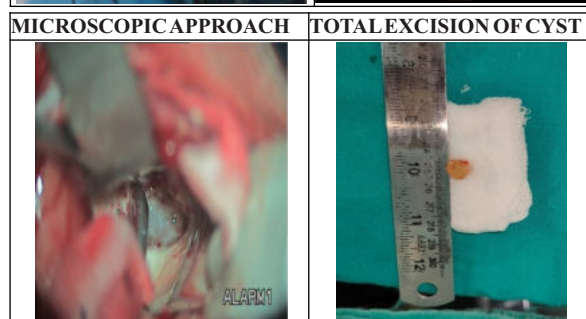
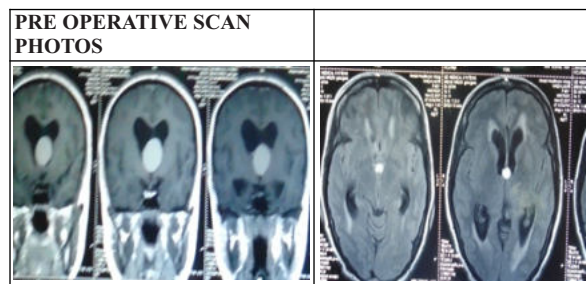
In the present study, we analysed data of 16 patients operated at King George Hospital, Visakhapatnam. The chief presenting symptom was headache in 75% of patients. The other symptoms included diminished vision, seizures and drop attacks. Most patients were operated via transcortical approach. Other approaches included transcallosal and endoscopic approach, depending on the size (less or more than 2 cms) of the cyst and the presence or absence of hydrocephalus. Complications included transient hemiparesis, aseptic meningitis, development of post operative hydrocephalus and intracerebral hematoma. Of 16 patients, 14 showed improvements, 1 patient remained unchanged, conditions of 1 patients transiently worsened but improved over time. In the studied cases, all of the colloid cysts were completely excised. In our present series all the three approaches transcortical, transcallosal and endoscopic had good outcomes with endoscopic approach having the least ICU as well as hospital stay. There are a few recent approaches in the management of the colloid cysts which include CT guided stereotactic aspiration, stereotactic microsurgical approach and removal of the colloid cyst by laser, and stereotactic-guided endoscopic laser therapy. We did not perform any of these approaches for the cases in our present study.

Financial support & Sponsorship:

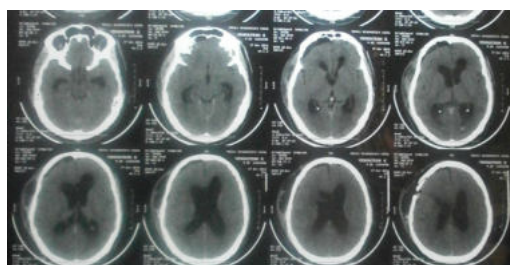
No financial support has been taken for this study.

Conflicts of interest:

There are no conflicts of interest.



POST OPERATIVE SCANS



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