

TRANSCALLOSAL, TRANSFORAMINAL APPROACH FOR EXCISION OF COLLOID CYSTS OF THIRD VENTRICLE

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ABSTRACT

Objective: To study the efficacy of transcallosal, transforaminal approach in excision of colloid cysts of third ventricle in terms of complete excision and post-operative complications.

Study Design: Prospective observational study.

Place and Duration of Study: Study was carried out in neurosurgery department of CMH Rawalpindi, from July 2009 to Jun 2014.

Material and Methods: All suspected cases were subjected to CT scan and MRI of brain for diagnosis and size and site of colloid cyst. All patients having colloid cyst of anterior third ventricle irrespective of age, sex and size of the cyst were included in the study. Patients with recurrence or previous surgery were excluded from the study. Patients with psychiatric illness and abnormalities of memory were also excluded. A uniform approach in terms of position of patients, craniotomy site and flap elevation was adopted for all patients. Post operatively the complications were recorded at 2nd day and 6th week. Derangement of short and long term memory, beads stringing and touch localization were recorded on a specific proforma.

Results: A total of 19 patients with colloid cyst of 3rd ventricle were included, thirteen were male and 6 were female patients. The most common presentation was headache and vomiting. Most frequent cyst size was 1-2 cm and was present in 57.9%, while 4 patients presented with a large cystic swelling measuring 2-3 cm. A pre-operative shunt had to be inserted in two cases due to sudden deterioration of the neurological status. Most of the cases (68.4%) presented with hydrocephalus, and it was absent only in 6 cases. Complete excision was obtained in 17 cases while in 2 cases the cyst could not be removed completely. Most frequent complication on 2nd post-operative day was the impaired short term memory which was present in 13 patients. Beads stringing was impaired in 9 patients on 2nd post-operative day. On sixth post-operative week, only 2 cases had short term memory loss as improvement occurred in all complications.

Conclusion: Transcallosal, transforaminal approach is an effective and safe approach for the excision of colloid cysts of anterior third ventricle. Very few complications of less severity and temporary nature are associated with this approach.

Keywords: Colloid cyst, Hydrocephalus, Memory loss, Third ventricle, Transcallosal, Transforaminal.

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INTRODUCTION

Colloid cysts were first described in 1858 by Wallman¹. In 1921, Dandy was the first neurosurgeon who successfully removed a colloid cyst from the third ventricle through a posterior transcallosal approach². The anterior transcallosal approach was suggested by George Ehni³. Colloid cysts are histologically non-neoplastic epithelium lined cysts that represent

less than 3% of all intracranial tumors in most series. They are almost always located in the roof of the anterior third ventricle or often found immediately posterior to the foramen of Monro. and are the most common lesion intrinsic to the third ventricle. Colloid cysts are often found incidentally but when symptomatic, they present with obstructive hydrocephalus and paroxysmal headaches. Other symptoms are gait disturbance, short term memory loss and behavioral changes⁴. On rare occasion, they can cause sudden neurological deterioration, coma and subsequent death as a result of herniation due to complete and

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irreversible obstruction of foramen of Monro. Their removal poses a formidable challenge due to its deep location and intimate relationships with neural and vascular structures as well as hypothalamic-pituitary axis. Walter Dandy in 1921 accomplished the first successful resection of a colloid cyst through a transcortical transventricular approach⁵. Based on the works of Dandy, exposure of the third ventricle has historically been achieved via the transcortical route. More recently, the safety of sectioning the corpus callosum when splenium is spared has been confirmed⁶. As a result an increased interest in the interhemispheric (transcallosal) approach to the third ventricle has been observed over the

cysts of the anterior third ventricle who were treated surgically by the transcallosal, transforaminal approach were analyzed. Patients were included irrespective of age and sex. Computed tomography imaging in axial, coronal and saggital planes was performed in all patients pre-operatively (fig-1). Computed tomography was performed in all patients pre-operatively and at 6 weeks post-operatively. The size, density/intensity, degree of contrast enhancement and the presence of hydrocephalus was analyzed. Pre-operative radiological assessment to establish a clear perspective of each patient's individual anatomy along the operative corridor was performed. The size of the cyst and presenting

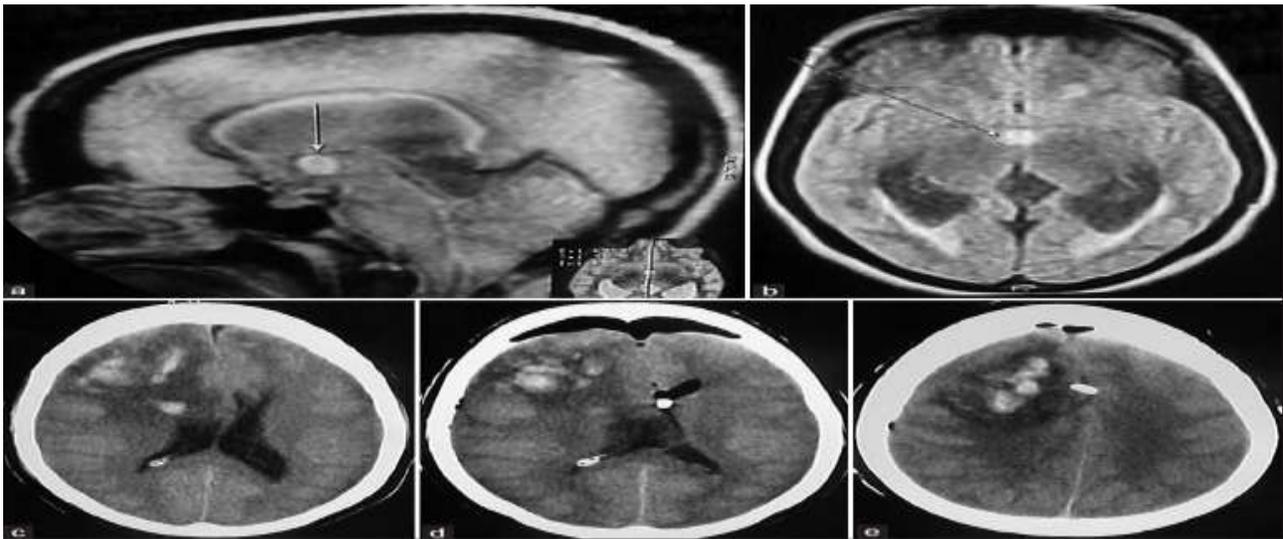


Figure-1: Pre operative CT scan of a patient.

past 25 years⁷. More recently there is an increase in endoscopic and combined approach excision of colloid cysts of the third ventricle⁸⁻¹⁰. In this case series, we reported the operative outcome of 19 patients with colloid cysts of the third ventricle operated via the transcallosal, transforaminal approach at Combined Military Hospital Rawalpindi over a period of five years.

PATIENTS AND METHODS

This observational study was carried out in Neurosurgery department of Combined Military hospital Rawalpindi from July 2009 to June 2014. A total of 19 patients having colloid

complaints were recorded. A preoperative ventriculoperitoneal (VP) shunt had to be inserted in two patients due to sudden deterioration in their neurological status. A unified approach was adopted to operate these patients. The salient features of the operative technique are described as follows. The head is placed in a neutral position with 15° of flexion. A 6×4×3 cm bone flap based on the right side, two thirds anterior and one third posterior to the coronal suture with sagittal sinus exposure was used. A dural flap with base medially towards the sagittal sinus was elevated. A bridging vein was sacrificed anterior to the coronal suture in 7 patients. An interface

between the falx and cortex is identified and an inter-hemispheric corridor not exceeding 5cm in length and 2 cm in width was developed using a 2 cm retractor blade (fig-2). The corpus callosum and pericallosal arteries were identified and entry to lateral ventricle was made. The trunk of the corpus callosum was incised 2-2.5 cm anterior to the mid portion of the corpus callosum. Once entry to the ventricle was made proper orientation was established. The foramen of Monro, choroid plexus and thalamostriate vein were identified. All the cysts were initially aspirated to reduce their mass through the foramen of Monro. All the attachments to the anterior third ventricle were freed before removing the cyst. The cysts were removed completely in all but 2 patients. Sectioning of the fornix column was not performed in any patient. All patients were assessed post operatively on 2nd day and then on 6th post-operative week. Assessment of the interhemispheric somatosensory and motor transfer of information and short and long term

three groups depending upon the age and 42% belonged to age group of 30-40 years (mean 1.1 with standard deviation 0.335). All patients presented with the complaints of headache and vomiting, (fig-3). The most frequent size of cyst



Figure-2: Post operative CT scan of a patient.

encountered was 1-2 cm (57.9%). while only 4 patients presented with a large cystic swelling measuring 2-3 cm. Most of the cases (68.4%) presented with hydrocephalus and it was absent

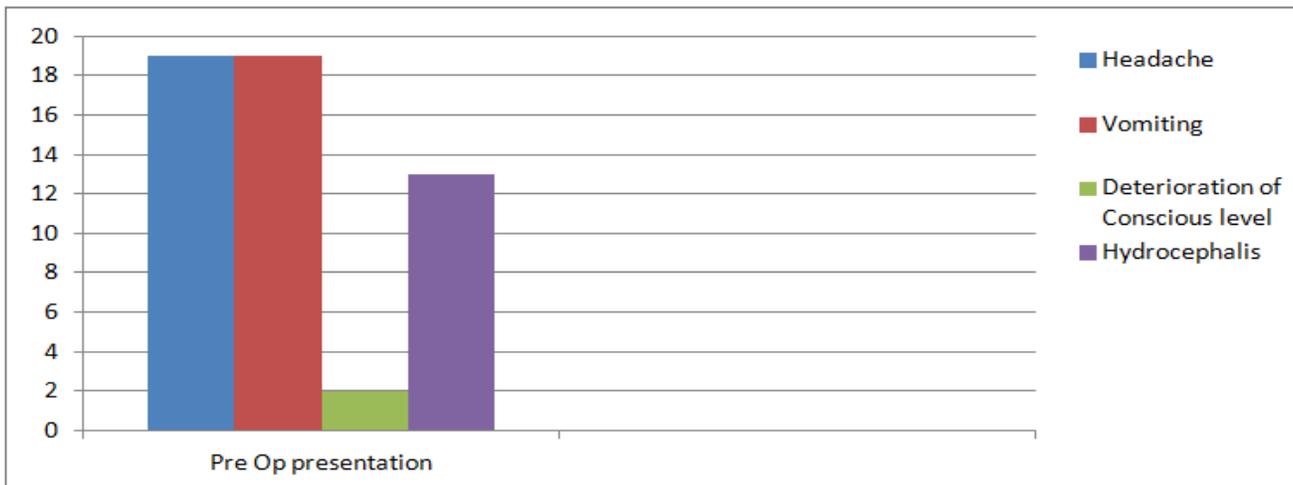


Figure-3: Pre operative presentation.

memory were performed. The interhemispheric transfer of visual, spatial and tactile information was assessed by touch localization and bead stringing tests.

RESULTS

A total of 19 patients were included in the study. Out of 19 patients, 13 were male and 6 were female patients. Patients were divided into

only in 6 cases. A pre-operative VP shunt was inserted in 2 cases due to sudden deterioration in their neurological status. Complete excision was achieved in 17 cases and only two cases with large cysts were incompletely excised. After the surgery, patients were evaluated on 2nd post-operative day and after 6 weeks for presence or absence of short term and long term memory loss, touch localization and beads stringing. On

2nd post-operative day, short term memory loss was present in 13 cases which improved and at 6th post-operative week only 2 cases had short term memory loss (table). Long term memory loss was present in two operated cases on 2nd post operative day which also improved with time and at 6th week, no patient had any long term loss. Impaired touch localization was present in 6 cases on 2nd post operative day, while at 6th post operative period only 2 patients had impaired touch localization. Beads stringing was impaired in 9 patients on 2nd post operative day. At 6th post operative week improvement was seen and only 4 patients had a mildly impaired beads stringing.

DISCUSSION

Colloid cysts of third ventricle are not very common and transcallosal, transforaminal approach is the safe route to excise these tumors.

by temporary post operative psychosis and third cranial nerve palsy. Only three individuals developed postoperative short term memory deficits as compared to 4 cases in our study. The patient with intra operative hemorrhage complained of slight permanent short time memory deficit. They also showed that the complications resolved during the first few months after surgery. The less post operative complications are attributed to precision of surgical excision with endoscopes.

Grondin et al carried out a comparative study of excision of colloid cyst with microsurgery and endoscopic removal¹³. They compared 25 cases of microsurgical resection with 9 cases of endoscopic removal of colloid cysts. They showed that endoscopic removal had fewer complications and less hospital stay as compared to microsurgical excision¹⁴.

Table: Post operatively evaluation of functions.

S. No	Function	2nd Post OP day	6th Post OP week
1	Short term memory loss	13	2
2	Long term memory loss	2	0
3	Impaired touch localization	6	2
4	Impaired beads stringing	9	4

In India, Symss et al carried out a similar study on colloid cysts¹¹. Their sample was large as compared to our study. They studied 78 cases and the duration of study was prolonged over 20 years. In their study, the commonest presenting feature was raised intracranial pressure and was present in 66.7% cases. Hydrocephalus was present in 83.3% of patients. Recurrence was found in 2 cases after a period of 6 years. They did not evaluate the patients for memory loss and beads stringing, and four patients required a post operative shunt for acute hydrocephalus.

Hellwiq et al performed neuro endoscopic removal of their patients presenting with colloid cysts of third ventricle¹². They studied 20 cases as compared to our 19 cases. Their study showed superior post operative results and less post operative complications. Only one patient developed intra operative hemorrhage followed

A similar study was carried out in children by Kumar et al¹⁵ in which 5 patients were operated microsurgically for the removal of colloid cyst. A total of 38 patients were studied. Their study found same frequency of symptoms as compared to our study. Raised intracranial pressure and headache were the most frequent clinical presentation. They adopted an inter-hemispheric, transcallosal approach for 3 patients and combined transforaminal and subarachnoidal approach for one patient. In only one case they carried out interforaminal approach.

Desai et al¹⁶ retrospectively studied 105 cases of colloid cysts between 1967 and 1998. Surgery was performed in 93 patients. They adopted two different approaches as compared to our study. The approach adopted in their cases was a transcallosal and transcortical-transventricular approach. Similarly headache was the most

common presenting feature in the study as was in our study. In their series, papilledema and memory disturbances were the most common signs in contrast to our study. Total excision was achieved in 90 patients. In their series, 5 patients died while there was no mortality in our series.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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