

Original Article

Endoscopic Transcortical Transventricular Colloid Cyst Excision — Our Experience

Haroon K¹, Taher T², Alamgir A³, Reza A⁴, Hossain SS⁵

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Contribution of Authors :

Principal Investigator- Dr. Kaisar Haroon.
Data collection- Dr. Abdullah Alamgir, Dr. Arif Reza
Manuscript preparation-Dr. Kaisar Haroon, Dr.Tania Taher
Editorial formatting- Dr. Sk Sader Hossain

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Abstract:

Background: Colloid cyst of the third ventricle is a tumour arising from the roof of the third ventricle at the foramen of Monro. Endoscopic excision of colloid cyst is well established technique. There is less morbidity in comparison to the microsurgical resection.

Materials and method: Seven patients with colloid cyst were treated with endoscopic excision. Of these five were males and two were female patients. Age ranged thirty to fifty five years from a period from Jan 2016 to Mar 2019 in NINS&H.

Results: Most patients had signs of raised intracranial pressure before surgery. Six patients needed post operative VP shunt. Some patients had contusion of the fornix but did not have any memory impairment. Five patients had remnant but there was no symptoms after surgery.

Conclusion: Endoscopic excision of the colloid cyst is a good option. Total removal of the tumour is the goal but little remnant of the tumour attached to the tela choroidae is accepted. One year follow-up showed no recurrence of the cyst.

Key Words: Colloid cyst, neuroendoscopy, hydrocephalus, third ventricle, foramen of Monro, fornix injury

Abbreviations: CC-Colloid Cyst, ICP- Intracranial Pressure, CSF- cerebrospinal fluid

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Introduction:

Colloid cysts are thin-walled, spherical cysts composed of a collagenous capsule, an underlying epithelium, and a gelatinous center of variable viscosity. The cysts are usually attached to the anterior aspect of the velum interpositum or to the choroid plexus of the third ventricle near the foramina of Monro¹.

The average patient age was 39 years old (range, 14-61 years) at the time they underwent surgery. Gender distribution was 10 females and 10 males². Another

series included five males and two females ranging in age from 14 to 57 years (mean 40 years)³. Another series, included 13 males and 6 females, mean age was 35 years (Range 19-56)⁴. The male to female ration was 1.5:1⁵.

There have been a small number of reports describing of Colloid Cysts in other locations, including the septum pellucidum, frontal and parietal lobes, fourth ventricle, brainstem, cerebellum, olfactory groove, optic chiasm, pituitary gland, and suprasellar region⁶. Some authors speculated that the points of origin of these

1. Dr.Kaisar Haroon, Assistant Professor, Department of Neurosurgery, NINSH

2. Dr. Tania Taher, Assistant professor, HFRC Medical College Hospital.

3. Dr.Abdullah Alamgir, Associate Professor, Department of Neurosurgery, NINSH.

4. Dr. Arif Reza, Medical Officer, Department of Neurosurgery, NINSH

5. Prof. Sk. Sader Hossain, Professor and Head, Department of Neurosurgery, NINSH

Address of Correspondence:Dr. Kaisar Haroon, Assistant Professor, Department of Neurosurgery, NINS&H. Email: kaisar298@gmail.com, **Phone:** +8801711196577. ORCID: 0000-0002-3065-7877

cysts should be at areas away from the foramina of Monro and at which some anatomical “windows” exist that are devoid of compact, closely apposed forniceal structures⁷.

Sign and symptoms of colloid cysts include intermittent headache (10 patients), nausea (3 patients), short-term memory loss (4 patients), coma (2 patients), gait disturbance (3 patients), blurred vision (2 patients), and mental status changes (3 patients)⁸. In another series, headache was the most common presenting symptom in this series, being a primary complaint for 8 of the 12 patients⁹. Headache was predominant symptom in 97 out of 150 patients and followed by papilledema in 76 patients⁵.

Direct visualization of a colloid cyst using a modern rigid endoscope was performed for the first time by Guiot et al. in 1963⁸. Treatment considerations include conservative management, serial radiographic studies, ventricular shunting of the hydrocephalus, and direct surgical obliteration by microsurgical technique or endoscopic procedure¹⁰. We have used the endoscopic approach for this series of patients but we were prepared to convert to microsurgery if it was necessary.

Shunting is less satisfactory for several reasons: 1) bilateral obstruction of the foramen of Monro requires a bilateral ventricular catheter or a unilateral ventricular catheter associated with septum pellucidum fenestration; 2) shunts are susceptible to malfunction, which may lead to severe symptoms in such noncommunicating hydrocephalus; 3) this noncurative treatment may lead to insidious growth of the cyst to considerable dimensions, causing irreversible memory disturbances⁸.

Therefore, in our series we had approached the tumour endoscopically through the transcortical transventricular transforaminal route and excised the tumour. VP shunt was reserved for patients in whom hydrocephalus was present after surgery.

Materials and method:

This is an observational and prospective study carried out on 7 patients in NINS&H from Jan 2016 to Mar 2019. Five patients were male and two patients were females. Four of seven patients presented to us with headache and two patients had visual disturbances. Colloid cysts were identified using MRI imaging or CT scan of brain. After proper evaluation surgery was done. Patient was placed in supine position with head

in the midline elevated 40°. The right lateral ventricle was approached through the right Kocher’s point. Then endoscopic transcortical transventricular transforaminal excision of the colloid cyst was done. The rigid endoscope Lotta ventriculoscope (Karl Storz SE & Co. KG) was used. The cyst would be dull yellow colored and occupied the the foramen of Monro. After puncture, there would be colloid material coming out (fig 1). This would be sucked out. Then the cyst wall was gently excised. In all cases after tumour excision, endoscopic third ventriculostomy was done.

Post operative an EVD was placed using Chhabra® VP shunt system. It was closed on 2nd POD and if patient was asymptomatic then it was taken off. If symptoms of raised ICP were seen then CT scan was done. If there was ventriculomagalay in the CT scan then VP Shunt was placed.

Results:

Table-I

Distribution of patients according to age group:

Sl. No.	Age	Sex	Features of raised ICP
1	35	M	Present
2	30	M	Absent
3	40	F	Present
4	55	M	Present
5	35	M	Absent
6	45	F	Present
7	40	M	Absent

From the above table we can see that five patients were male and two patients were female. Most patients aged from 35 to 45 years. Three patients did not have signs of raised intracranial pressure.

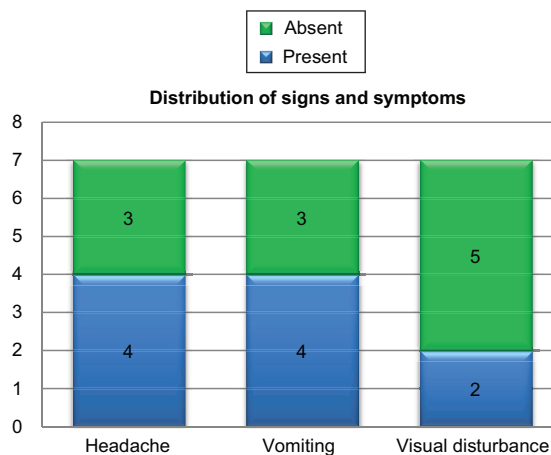


Fig 1: *Distribution of signs and symptoms.*

Table-II
Intraoperative complications.

	Fornix contusion	Memory impairment	Intraoperative bleeding
Present	3	0	4
Absent	4	7	3

Table-III
Post operative complication:

	Aseptic meningitis	Post operative VPS	Remnant of tumour
Present	5	6	5
Absent	2	1	2

Table-IV
Follow ups

	After six months	After one year
Recurrence	None	None
Remnant	4	4
Symptomatic	None	None
Visual improvement	All	All

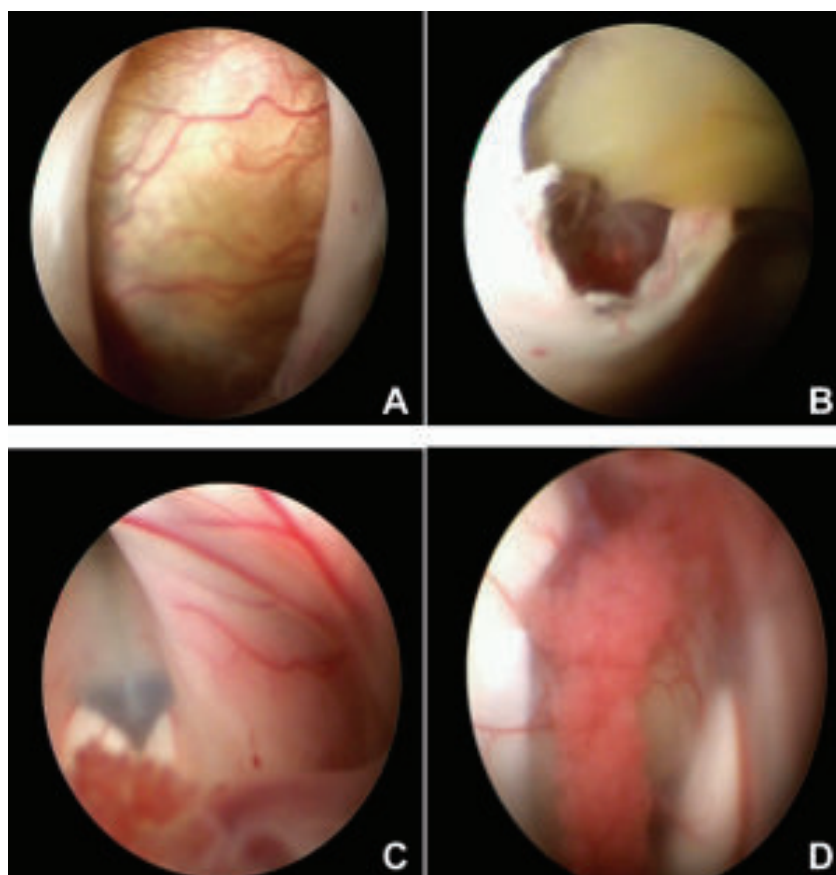


Fig.-2: Intraoperative photographs showing A) colloid cyst at the Foramen of Monroe B) colloid material coming out of the cyst C) floor of the 3rd ventricle can be seen through the foramen of Monroe D) another colloid cyst covered by Choroid plexus.

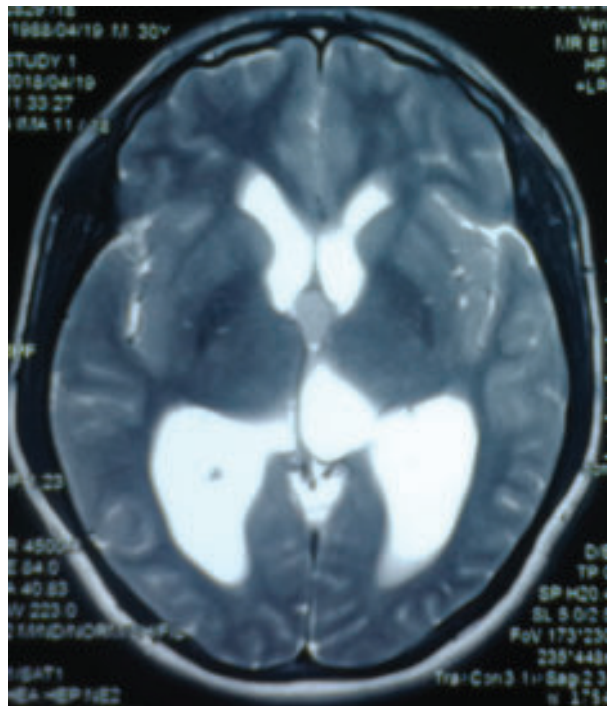


Fig.-3: Preoperative T2 weighted MRI showing a colloid cyst at the foramen of Monro

Discussion:

Our patients were followed up with MRI examination. Some had residual colloid cyst (five patients) without any clinical problems. In a series, CT scan was used for follow up⁵. Short-term follow-up studies have shown that cyst remnants usually do not cause clinical problems requiring surgical action². Even after one year, there were only 4 patients who had asymptomatic remnants of the cyst.

We have used the Lotta rigid neuroendoscope (Karl Storz®). This gave us the benefit of using the total diameter of the sheath. The rigid endoscope allowed the use of the entire inner diameter (approximately 6 mm) of the endoscopic sheath. This enables effective tissue resection¹¹. The surgical techniques were used to endoscopically resect a colloid cyst include: (1) trans-foraminal, and (2) trans-septal approaches¹². We used transforaminal approach for all patients in our series.

Unlike the transcortical and transcallosal approach, in the endoscopic approach residual cysts are common¹³. This has to be accepted by the surgeon and the patient. In a series it was also reported remaining of cyst wall in 3 patients². This is mainly due to adherence of the cyst wall with tela choroidae.

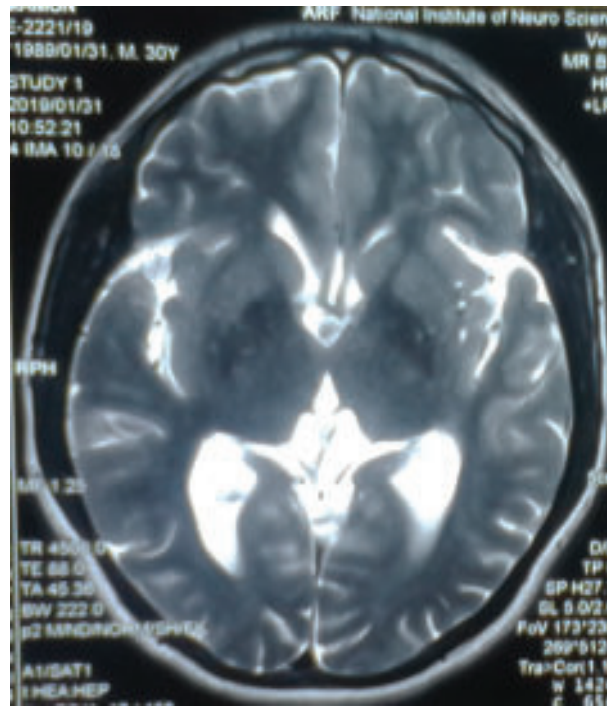


Fig.-4: Post operative T2 weighted MRI showing small residue after one year

But the cysts were totally drained. In our series, four patients had residual cyst wall after one year and they were followed up.

Most of the patients were shunt dependent in our series. We had to place VP shunt in six patients as they had developed hydrocephalus after surgery. In one series, patients were VP shunt-dependent because of aseptic meningitis after the endoscopic procedure¹⁴. In another series, one patient needed shunt⁹. Some of our patients had aseptic meningitis (5 cases), which resolved without any sequelae.

The main concern was intraoperative bleeding from the cyst wall. It would obscure the vision and therefore, would increase operative time. After bleeding, we would wait patiently while irrigation was going on. It would take 5-10 minutes for the CSF to be adequately clear for proceeding to the next step. In two cases, part of the capsule was left behind for safety of the patient. These patients were regularly followed up for recurrence.

Fornix preservation in neuroendoscopy is critical. Contusions of any extent occur in 16.4% of complex neuroendoscopic procedures, the most frequent intraoperative complication, and most are clinically silent¹⁵. So, fornix injury is to be avoided during

endoscopy, as this result in recent memory loss. We were very careful during surgery. Three patients had some stretching of the fornix without any discontinuity. Fortunately, these patients had no memory impairment.

Conclusion:

Gross total resection of colloid cyst should be the goal of endoscopic surgery in accordance with microsurgery. Complete removal is not always possible in the endoscopic approach. Therefore, the patients should always be followed up regularly for early diagnosis of recurrence of colloid cyst or any symptoms of raised intracranial pressure.

References:

1. Abdou MS, Cohen AR. Endoscopic treatment of colloid cysts of the third ventricle: Technical note and review of the literature. *Journal of neurosurgery*. 1998;89(6):1062-8.
2. Vorbau C, Baldauf J, Oertel J, Gaab MR, Schroeder HW. Long-Term Results After Endoscopic Resection of Colloid Cysts. *World neurosurgery*. 2019;122:e176-e85.
3. Lewis AI, Crone KR, Taha J, van Loveren HR, Yeh H-S, Tew JM. Surgical resection of third ventricle colloid cysts: Preliminary results comparing transcalsal micro surgery with endoscopy. *Journal of neurosurgery*. 1994;81(2):174-8.
4. Azab WA, Abdelnabi EA, Mostafa KH. Efficacy and Safety of the Rotational Technique for Endoscopic Trans-foraminal Excision of Colloid Cysts of the Third Ventricle. *World neurosurgery*. 2019.
5. Desai KI, Nadkarni TD, Muzumdar DP, Goel AH. Surgical management of colloid cyst of the third ventricle—a study of 105 cases. *Surgical neurology*. 2002;57(5):295-302.
6. Uno T, Hayashi Y, Sasagawa Y, Miyamori T, Oishi M, Nakada M. A suprasellar colloid cyst over an 11-year follow-up: case report and literature review. *World neurosurgery*. 2019.
7. Azab WA, Salaheddin W, Alsheikh TM, Nasim K, Nasr MM. Colloid cysts posterior and anterior to the foramen of Monro: anatomical features and implications for endoscopic excision. *Surgical neurology international*. 2014;5.
8. Decq P, Le Guerinel C, Brugieres P, Djindjian M, Silva D, Keravel Y, et al. Endoscopic management of colloid cysts. *Neurosurgery*. 1998;42(6):1288-94.
9. Rodziewicz GS, Smith MV, Hodge Jr CJ. Endoscopic colloid cyst surgery. *Neurosurgery*. 2000;46(3):655-62.
10. King WA, Ullman JS, Frazee JG, Post KD, Bergsneider M. Endoscopic resection of colloid cysts: surgical considerations using the rigid endoscope. *Neurosurgery*. 1999;44(5):1103-9.
11. Schroeder HW, Gaab MR. Endoscopic resection of colloid cysts. *Neurosurgery*. 2002;51(6):1441-5.
12. Azab WA, Najibullah M, Yosef W. Endoscopic colloid cyst excision: surgical techniques and nuances. *Acta neurochirurgica*. 2017;159(6):1053-8.
13. Horn EM, Feiz-Erfan I, Bristol RE, Lekovic GP, Goslar PW, Smith KA, et al. Treatment options for third ventricular colloid cysts: comparison of open microsurgical versus endoscopic resection. *Neurosurgery*. 2007;60(4):613-20.
14. Hellwig D, Bauer BL, Schulte M, Gatscher S, Riegel T, Bertalanffy H. Neuroendoscopic treatment for colloid cysts of the third ventricle: the experience of a decade. *Neurosurgery*. 2003;52(3):525-33.
15. Brunori A, de Falco R, Delitala A, Schaller K, Schonauer C. Tailoring Endoscopic Approach to Colloid Cysts of the Third Ventricle: A Multicenter Experience. *World neurosurgery*. 2018;117:e457-e64.