

Colloid cyst endoscopy case series

2021

A retrospective review was conducted of 45 consecutive symptomatic patients with third ventricle colloid cysts that were surgically treated with purely endoscopic surgery from 1997 to 2018.

Results: Mean age was 35.4 years. Male-to-female ratio was 1:1. Clinical presentation included predominantly headache (80%). Transforaminal was the most used route (71.1%) followed by transeptal (24.5%) and interforaminal (4.4%). Capsule was intentionally not removed in 42 patients (93.3%) and cyst remnants were absent on postoperative MRI in 36 (85%). Mild complications occurred in 8 patients (17.8%). Surgery was statistically associated with cyst volume and ventricular size reduction. There were no serious complications, shunts or deaths. Follow-up did not show any recurrence or remnant growth that needed further treatment.

Conclusion: Gross total resection may not be the main objective for every situation. Subtotal resection without capsule removal seems to be safer while preserving good results, especially in a limited resource environment. Remnants left behind should be followed but tend to remain clinically asymptomatic for the most part. Surgical planning allows the surgeon to choose among the different resection routes and techniques available. Decisions are predominantly based on preoperative imaging and intraoperative findings ¹⁾.

In total, 121 patients had a primary [colloid cyst](#) endoscopically removed and 10 patients had a total of 11 recurrent cysts removed. [Recurrence](#) or [progression](#) after surgery occurred in 3 (2.5%) cases in the primary cyst group and 2 (18.2%) cases in the recurrent cyst group. Symptomatic presentation during the follow-up period occurred in 6 (54.5%) cases in the recurrent cyst group versus 75 (62%) cases in the primary cyst group ($p = 0.749$). Two patients (20%) in the recurrent group had a second recurrence in a mean period of 30 months (1 patient at 15 and 1 patient at 45 months). One of these patients required a tertiary endoscopic removal 8 years after the second resection. No immediate [postoperative complications](#) or new morbidities were observed after repeat endoscopic surgery. The authors' findings indicated a nonsignificant trend toward a higher recurrence rate (18.2% vs 2.5%, $p = 0.055$) and a decreased proportion of complete removal (90.9% vs 81.8%, $p = 0.296$) in the recurrent cyst group compared to the primary cyst group. However, a significantly higher rate of preoperative hydrocephalus was observed in the primary cyst group compared with the recurrent cyst group (63.6% vs 18.2%, $p = 0.007$).

Purely endoscopic approaches for the removal of recurrent colloid cysts of the third ventricle are feasible and equally safe compared with endoscopic removal of primary cysts. The study's findings did not show a statistically significant difference in the rate of recurrence between the 2 groups. The proportion of patients with symptomatic cysts on presentation was lower in patients with recurrent cysts than in patients with primary cysts. Due to the high rate of complete removal with negligible morbidity, the authors continue to advocate for an endoscopic removal at the time of cyst recurrence ²⁾.

2016

27 consecutive patients with symptomatic primary and recurrent colloid cysts. All cysts were removed via a neuroendoscope through a rostral transfrontal, transforaminal approach. The endoscope was supported by an additional cannula fixed in the stereotactic frame. Both tools were inserted into one lateral ventricle through two separate burr holes using stereotactic guidance.

The median operating time was 135 minutes. All cysts were removed completely, and no mortality or permanent complications related to surgery occurred. The mean time of observation was 43.5 months (range, 3-78 months), and no clinical or radiologic recurrences were observed. One patient with a history of an infected ventriculoperitoneal shunt did not improve after cyst removal, but improved after subsequent reimplantation of the shunt. In all other cases, symptoms resolved (67%) or decreased (30%). Cognitive functions improved or remained unchanged in all 10 elective cases examined neuropsychologically before and after surgery.

The technique describe for removal of colloid cysts are safe and effective, even for recurrent cases, and they provide 100% total resection, favorable cognitive outcomes, low risk of recurrence, and low risk of morbidity. The disadvantages of this method are a longer time for surgery and the need for more complex instrumentation compared with conventional endoscopic resection ³⁾.

2014

56 patients were reviewed. Surgeries involved an anterolateral neuroendoscopic technique. Patients were followed postoperatively for an average of 14.9 months. Patients were also interviewed regarding their preoperative symptoms, resolution of symptoms postoperatively, and their degree of satisfaction.

The median operative time was 82 minutes, and the median duration of hospital stay was 5 days. During surgery, the ventricles were explored for residual cyst wall or cyst content, and none were encountered. On immediate postoperative imaging, cyst recurrence was not noted for any patient, and only 1 patient has had evidence of recurrence on long-term follow-up. Various preoperative symptoms were described by patients; depending on the specific symptoms, 70%-100% resolution of symptoms was shown after surgery. Along with clinical follow-up, patients were interviewed regarding their perception of surgery and recovery. Of the patients contacted, 100% reported satisfaction with the surgery, and 91% noted satisfaction with their recovery. Reported complications included memory loss, infection, deep vein thrombosis, and postoperative hematoma. There were 2 perioperative deaths (3.5%) related to surgery.

Neuroendoscopic colloid cyst resection can reliably achieve complete lesion removal with short operative times. In addition, there is a high level of reported patient satisfaction. This is till 2014 the largest case series of neuroendoscopic colloid cyst resections from a single surgeon ⁴⁾.

24 patients with colloid cysts of the third ventricle treated in our department between October 2001 and January 2013 using an endoscopic approach. Clinical presentation, preoperative radiological findings, endoscopic technique employed, and complications were assessed in all patients. The mean length of patient follow-up was 5.16 years. The most common symptom was headache (75%). The average size of the resected colloid cysts was 16.25 mm, the maximum diameter measured in cranial

magnetic resonance imaging. Resection was transforaminal in 16 cases (66.7%), transchoroidal in 7 (29.17%), and transeptal in 1; macroscopically complete resection was achieved in 23 of 24 procedures (95.8%). Complications included three intraventricular hemorrhages, four memory deficits (two of them transient), one case of temporary potomania, two soft tissue infections, and one meningitis. There were no statistically significant differences between the route of resection and number of complications. The Glasgow Outcome Scale at 1 year after surgery was 5 in 82.6% of the patients. A transventricular endoscopic approach allows macroscopically complete resection of third ventricle colloid cysts in most cases. The option of opening the choroidal fissure (transventricular-transchoroidal approach) during the procedure can address third ventricle colloid cysts that do not emerge sufficiently through the foramen of Monro without increasing procedure-related morbidity ⁵⁾.

29 patients who underwent surgery by a variation of the standard worldwide implemented endoscopic technique. Using a more anterior approach, it is easier to reach the roof of the cyst, its possible adherences with the tela choroidea, plexus, and the internal cerebral veins. The described approach has shown to be safe, quick, and very effective with a total cyst removal rate of 86.2% ⁶⁾.

24 patients. Preoperative computed tomography (CT) scans revealed hydrocephalus in all the patients. Postoperative magnetic resonance imaging (MRI) was done in all cases.

Age ranged from 16 to 57 years. There were 16 male and 8 female patients. The diameter of the cyst varied from 14 to 24 mm. Operating time ranged from 90 to 156 minutes. Total resection was achieved in 21 patients. All patients with subtotal excision underwent coagulation of residual cyst wall. The follow-up period ranged from 6 to 78 months (mean, 37 months). None of the patients developed any symptoms at 26, 31, and 39 months of follow-up. Preoperative symptoms disappeared in all the patients except for memory disorders and seizures in one patient each. No residual cyst was observed on the postoperative MRIs in 21 patients. Hospital stay was 4 to 10 days (median, 6 days). No endoscopic operation was converted into an open resection.

Endoscopic excision of a colloid cyst is an effective and safe alternate method. Although the follow-up time was short, residual cyst wall remained asymptomatic without any evidence of growth after subtotal excision and coagulation of wall ⁷⁾.

2013

Of 22 patients, near-total resection was obtained in 95%. In 3 cases, a very small, radiographically occult residual was left. Complete cyst wall resection was therefore obtained in 18 (82%). There were no cases of recurrence at follow-up in any patient. No patients required craniotomy or underwent re-resection. Fifteen of 16 (94%) patients with long-term clinical follow-up remained stable or improved.

High rates of complete colloid cyst resection, with low morbidity, are possible with an anterolateral endoscopic approach with dual-instrument technique. These results support the findings of other endoscopists that show how technical modifications to traditional endoscopic approaches can produce favorable results ⁸⁾.

Sixteen patients (8 female) underwent attempted endoscopic removal of a colloid cyst in the absence of ventriculomegaly. Surgery was technically successful in 15 patients. The cyst was removed completely in 13 of patients. **Short term memory** loss was initially present in 3 patients and completely resolved in all but 1 patient who had presented with short-term memory loss. Temporary complications occurred in 2 patients.

Normal-size ventricles are not a contraindication to endoscopic removal of third ventricular colloid cysts. Complication rates are at least comparable to those of patients with ventriculomegaly or to those undergoing open microsurgical resection ⁹.

Sixty-five consecutive patients and 67 procedures for endoscopic resection of colloid cysts from 1995 to 2011 were reviewed. Degree of resection was based on intraoperative assessment and postoperative magnetic resonance imaging (MRI). Recurrence rates were compared between patients with complete resection those with coagulated cyst remnants.

Data analysis was performed of 56 patients and 58 procedures, with no follow-up in 9 patients. All patients had MRI-defined complete resection. On intraoperative assessment, 9 procedures had coagulated remnants and 45 procedures had complete resection (4 data unknown). The overall recurrence rate was 6.89% (4/58), 33.3% (3/9) with cyst remnants, and 2.2% (1/45) with total resection (P = .0124). Maximum follow-up was 144 months (mean, 40.4 months). Mean follow-up was 66.0 months for cyst remnant cases, and 33.5 months for totally resected cases. There was no mortality or permanent morbidity. Transient morbidity included memory deficit (n = 2), aseptic meningitis (n = 1), and local wound infection (n = 1).

Endoscopic colloid cyst resection results in a low overall recurrence rate. Immediate postoperative MRI was insufficient for assessing degree of resection and was a poor predictor of recurrence. Ablation of cyst remnants rather than total removal is associated with a significantly higher rate of recurrence. The primary goal of endoscopic surgery should, therefore, be removal of all cyst contents and wall remnants ¹⁰.

2006

18 patients between 1996 and 2006. All patients were operated through a single burr hole at Kocher's point using a rigid endoscope with a single working channel. The anatomical variations of the cyst and the foramen of Monro dictated the use of the transforaminal approach, the transeptal interforaminal approach or both.

There were no mortalities or significant morbidities. The operative time ranged between 90 to 240 minutes (with a mean of 133 minutes). Five patients (27.7%) developed remediable postoperative chemical meningitis successfully controlled with steroids. Postoperative transient memory disturbance was observed in 3 patients (16.7%). One patient had a postoperative CSF leak that stopped spontaneously. Aspiration of the cyst's contents showed variable degrees of resistance to aspiration. The period of follow-up ranged between 5 months to 8 years and 3 months (mean: 4 years and 2 months). None of our patients showed radiological evidence of cyst recurrence during the follow-up period.

Through a single right pre-coronal burr hole at Kocher's point, several endoscopic manoeuvres can be done. These include aspiration of the contents or its piecemeal removal, combined balloon squeeze

and aspiration, foraminoplasty, pellucidotomy, coagulation of cyst capsule and ETV. The choice of the appropriate approach is largely dependent on the location of the cyst and the shape of the foramen of Monro. Coronal MRI may aid in preoperative evaluation of the tucked up retroforaminal growth of the cyst. We had no recurrence in our series with a follow-up reaching more than 8 years. This could be attributed to both the marsupialization and coagulation done for the remaining cyst capsule ¹¹⁾.

2000

Twelve patients underwent 14 endoscopic operations in attempts to treat their colloid cysts. All patients were symptomatic, with headache being the most common complaint (8 of 12 patients). Six patients in this series exhibited enlarged ventricles associated with their colloid cysts. Using rigid endoscopes of $<$ or $=3.5$ -mm diameter, the cysts were inspected and fenestrated. Both hard and soft cyst contents were evacuated, and then the walls of the cysts were coagulated inside and outside. External ventriculostomy tubes were usually placed. Technical obstacles to successful completion of endoscopic colloid cyst surgery are discussed.

For 11 of the 12 patients, the colloid cysts could be treated via an endoscopic approach. The mean follow-up time was 173 weeks, and the median follow-up time was 125 weeks. For the 12th patient, bilateral scarring of the foramina of Monro precluded direct surgery; therefore, a septostomy was performed and a ventriculoperitoneal shunt was placed ¹²⁾.

1999

Fifteen patients with a radiological diagnosis of colloid cysts were given the option of undergoing either endoscopic surgery or craniotomy. The average tumor size was 1.43 cm. Fourteen patients underwent planned endoscopic resections, and a craniotomy was performed initially in one patient.

Entire tumor resection was achieved with the endoscope in 12 patients (86%). A craniotomy was required for two colloid cysts that could not be resected endoscopically. In total, complete radiographic resections were achieved in 14 patients (93%). There were no permanent complications, although postoperative deficits included short-term memory loss and hemiparesis, each in one patient.

Rigid endoscopy affords good optical resolution, high magnification, and excellent illumination. Total or near total resection of colloid cysts should be the goal for all patients and can be achieved using the rigid endoscope, with little morbidity, shortened operative time, reduced length of stay, and resolution of symptoms. Although long-term follow-up is needed, we think that endoscopy should be considered as a primary treatment for most patients ¹³⁾.

1998

The presenting symptoms of our patients (10 men and 5 women) were 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). The sizes of the cysts ranged from 4 to 50 mm (median, 22.93 mm). Depending on the radiological appearance, the procedure was performed via a right (10 patients) or left (5 patients) precoronal burr hole. A rigid neuroendoscope was used. Initial stereotactic placement of the neuroendoscope was used in two

patients who had moderate hydrocephalus. In the other patients, hand-guided endoscopy was performed using an articulated arm. The cysts were perforated with a needle. The opening was enlarged with microscissors. The cyst material was aspirated, and the remaining capsule was coagulated.

The average follow-up was 15.26 months (range, 1-28 mo). Total aspiration of the cysts was achieved in 12 patients, as revealed by normal postoperative magnetic resonance imaging. Control magnetic resonance imaging revealed residual cysts in three patients. One patient presented with an asymptomatic recurrence at 1 year. Resolution of the symptoms was obtained in all patients except for two of the four patients with preoperative memory deficit (improvement without complete recovery). There was no mortality or morbidity.

These results show that endoscopy is a safe and promising percutaneous technique for the treatment of colloid cysts of the third ventricle. Longer follow-up is, however, still required ¹⁴⁾.

The surgical technique for the endoscopic evacuation of colloid cysts of the third ventricle in 13 patients is described. The authors conclude that endoscopic resection of these lesions is a useful addition to the current surgical repertoire and a viable alternative to stereotactic aspiration or open craniotomy ¹⁵⁾.

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