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Technical nuance. Total endoscopic removal of third ventricle colloid cyst

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ABSTRACT

Background. Colloid cyst treatment with purely endoscopic surgery is considered to be safe and effective. Complete capsule removal for gross total resection is usually recommended to prevent recurrence but may not always be safely feasible. Our objective was to go for complete endoscopic surgery using mainly aspiration, manipulation and coagulation with complete capsule resection and discuss the rationale for the procedure.

Methods and materials. A case report with a third ventricle colloid cyst was surgically treated with a complete endoscopic excision using the proper technique.

Results. Our patient underwent Transforaminal endoscopic surgery and the cyst was excised completely and the capsule was removed intentionally. Cyst remnants were absent on postoperative MRI. Mild Intraventricular haemorrhage was an intraoperative complication. Surgery was statistically associated with cyst volume and ventricular size reduction. There were no serious complications postoperatively. Follow-up did not show any recurrence or remnant growth that needed further treatment.

Conclusion. Gross total resection may be the main objective for selected cases and seems to be safer while preserving good results, especially in a limited resource environment. 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. Full-endoscopic approach for third ventricle colloid cyst removal is a feasible technique. Cyst aspiration followed by grasping and rotational manoeuvre for the cyst wall provides total removal with the resolution of the obstruction if present and relief of symptoms.

Keywords
third ventricle, intraventricular colloid cyst, endoscopic surgery, complete excision, foramen of monro

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INTRODUCTION

Intraventricular colloid cysts are a rare, benign cystic lesion originating from embryonic remnants of the brain endoderm. The most common location is in the rostral portion of the third ventricle near the opening of interventricular foramen of Monro. Obstructive hydrocephalus is the common presentation in symptomatic patients due to blockage of the CSF pathways around the foramen of Monro [2]. This makes surgical resection mandatory and treatment of choice for large (>7 mm) symptomatic cysts with hydrocephalus.

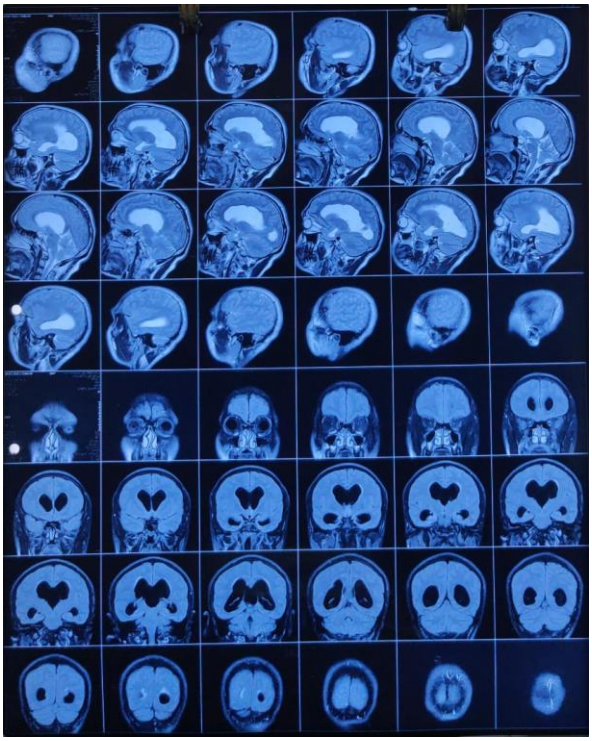
There are various surgical options such as ventriculoperitoneal shunt, pure aspiration of the cyst material, microsurgical or complete

endoscopic resection of the cyst. The newer endoscopic approach is a well-known and established option for surgical candidates. It offers shorter ICU and hospital stays, fewer complications, lower costs and shorter duration of surgery compared to microsurgery [3, 4]. The endoscopic view reveals better and complete anatomy of the cyst, it's exact location and attachments to the roof of the third ventricle and relations to the surrounding structures [1].

Neurosurgeons regularly use the transforaminal (TF) route for the cysts localisation. It leads to easy access to the cyst, followed by opening of its capsule, aspiration of its mucinous contents and coagulation of the base with complete resection of. Route variations such as transseptal or interfornical are required for proper aspiration, coagulation and removal of the cysts in some difficult cases with complex anatomy. In this article, the author has presented a case report to show that the total endoscopic technique is effective and has a low recurrence and complication rate.

Case presentation

A 29 years old male patient presented to us with complaint of progressive dimness of vision in right eye followed by in left eye associated with headache (on and off) since 2 months.



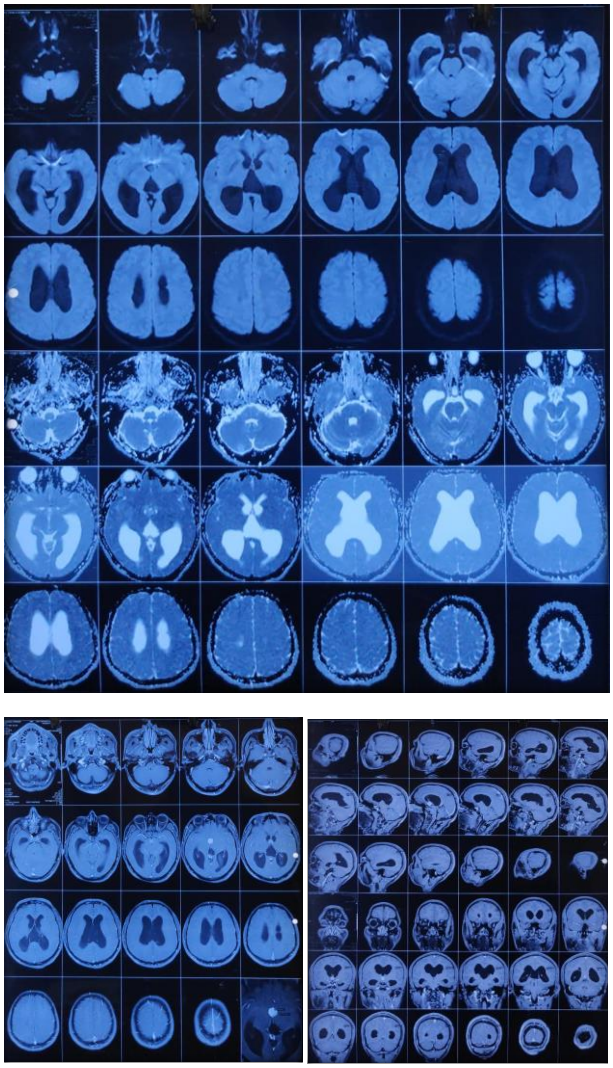


Figure 1. Preoperative MRI plain with contrast scans.

On examination he was E4 V5 M6 with no perception of light on left eye and counting fingers at 3 feet on left eye. Right pupil was non reacting to light and Left sluggishly reacting to light with rest Neurology was normal. MRI scans were suggestive of third ventricular lesion which was hyperintense on T1W and hypo to isointense in T2W images with no contrast enhancement (Fig a,b,c,d). Surgery was planned and he underwent endoscopic removal of tumor. During intraoperative period there was mild oozing of blood from tumor bed which was managed by saline irrigation and electrocauterization. Postoperative period was uneventful and patient is doing well.

Operative technique

A single skin incision was made, five cm anterior to the coronal suture and four cm lateral to the midline

followed by a large burr-hole measuring about 14 mm in diameter was created. We think that this entry point into the lateral ventricle provides a good enough view of the third ventricle cyst. In most cases, the side with the bigger ventricle was selected, and the right side was used to stay in the non-dominant hemisphere if both ventricles were equal.

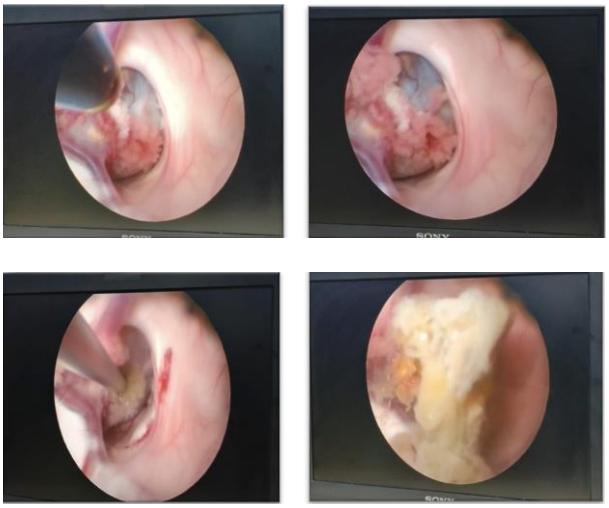


Figure 1-4.

Figure P. (Post-operative CT scan).

Ventricular puncture was performed initially by needle insertion 5-7 cm deep and the CSF flow was obtained. Next puncture was made using a trocar introducer. The trocar was removed and the sheath was stabilized with the assistant's help. The 0°-angled neuroendoscope which have an internal working channel diameter of 3.1 mm and a length of 122 mm, was inserted through the sheath, and the surgical operation was initiated under visual control. At the level of the foramen of Monro, the cyst was found (Figures 1 and 2). Before excising the cyst wall, we opted to aspirate the cyst's constituent parts. If the cyst is removed without aspirating its constituent parts, it may rupture, causing subtotal resection of the cyst wall that remains and perhaps impairing eyesight. The cyst's attachments were coagulated following the cyst's mobilization and emptying of its contents (Figures 3 and 2).

Little oozing from the ventricular wall was noticed during the procedure and this was managed by compression, continuous saline irrigation, and electrocauterization. The cyst was completely excised by firmly holding the cyst wall with small forceps and rotating (swiveling) the cyst wall to accomplish complete resection. Following the procedure, a standard external ventricular drainage (EVD) was left in place before being closed. Following surgery, the patient was shifted to the neurosurgical intensive care unit for postoperative monitoring and an assessment of any minor bleeding. When the CT brain plain was obtained on the first postoperative day, there was not much IVH, and it was treated conservatively (Figure P). When not even the cyst capsule was seen in the pictures, total resection was declared.

Discussion

Surgery is necessary for symptomatic patients with hydrocephalus since there is a 10% chance of abrupt death. There is disagreement concerning the optimal surgical therapy modalities. In contemporary neurosurgery, methods like stereotactic cyst aspiration or ventriculoperitoneal shunting are often abandoned. While safe, effective, and minimally invasive, stereotactic cyst aspiration simply removes the cyst's substance. Small or dense cysts might be problematic. High recurrence rates result from the cyst capsule being left behind (12). The most often used surgical techniques are endoscopic removal and microsurgical excision, according to a meta-analysis. The surgeon's experience and personal preference play a major role in selecting between the two techniques. The reason ETV has become so popular is because it is successful procedure,

provides shunt free period and a lifelong dependency on shunt surgery can be avoided. This operation was most suited for our patient, who had hydrocephalus and a third ventricular cyst. After undergoing transforaminal endoscopic surgery, the cyst was removed completely. One intraoperative complication was mild intraventricular bleeding. Conservative management was observed for the minimal number of post-operative problems. Surgery is statistically linked to ventricular size and cyst volume. Following surgery, there were no significant problems. There was no recurrence or residual growth that required medical attention, according to the follow-up.This technique can serve as a good alternative for VP shunting and open microscopic excision.

Conclusion

When compared to microsurgical technique, complete excision by endoscopic technique appears to be safer while maintaining best results and safety, particularly in a limited area of exposure. It should be the primary goal in every case. The surgeon can select from a variety of resection routes and techniques for surgical planning. Preoperative imaging and intraoperative findings are the main sources of decision-making. It is very possible to remove a third ventricle colloid cyst using a full-endoscopic method. If an obstruction is present, it can be resolved and symptoms can be relieved by aspirating the cyst and then gripping and rotating the cyst wall. Our paper is a case repot that demonstrates the effectiveness of the whole endoscopic procedure with minimal complications and no recurrence.

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