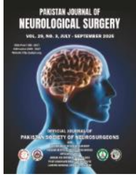

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Case Report

Lateral Intraventricular Epidermoid Cyst: A Rare Case Report

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ABSTRACT

The ectopic embryonic epithelial cells that give rise to epidermoid cysts are a common form of benign brain tumor. On the other hand, intraventricular epidermoid cysts are uncommon, and lateral intraventricular epidermoid cysts are even less common. Here, we discuss the pertinent literature and report a case of a lateral intraventricular epidermoid cyst. A 33-year-old male presented with complaints of aphasia, vomiting, inability to walk, and a previous history of VP shunt, which was blocked on examination. A brain computed tomography revealed an enlarged left ventricle and a low-density mass in the lateral ventricle. The mass was identified as an epidermoid cyst by cranial magnetic resonance imaging. The patient had a microscopic surgical excision along with endoscopy via the Keen's point as a tract to reach the ventricle. The patient recovered well after the bulk was satisfactorily removed. Because lateral intraventricular epidermoid cysts can invade adjacent brain tissue or impede the cerebrospinal fluid system, they frequently cause clinical symptoms. Magnetic resonance imaging is used for diagnosis, while surgical resection is used for treatment. Patients typically have very good prognoses, albeit this depends on how cleanly the tumour is removed.

Key Words: Epidermoid Cyst, Lateral Intraventricular, Prognosis, Surgery.

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INTRODUCTION

Epidermoid cysts are considered to arise from embryonic remains originating from ectodermal residues after the completion of neuroembryonic development at 3 to 5 weeks of gestation.[1,2] Intracranial epidermoid cysts are responsible for nearly 1.0% of all intracranial tumors.[3] Epidermoid cysts are most abundant in the cerebellopontine angle (CPA), followed by the cerebellopontine cistern, parasellar area, tentorium, middle cranial fossa (MCF), and ventricle.[4–6]

A complete capsule, a distinct border, insufficient blood supply, delayed growth, loose tumor tissue, and other peculiarities are characteristics of epidermoid cysts. They include many cholesterol particles and are mostly made of

a caseous substance made up of exfoliated cells.[7] Additionally, often encircling peripheral cranial nerves or blood vessels, epidermoid cysts can also breach and corrupt normal brain tissue structure as they grow along the basal cisterns.[8]

The features of epidermoid cysts include a full capsule, a clear boundary, insufficient blood supply, slow growth, loose tumor tissue, and more. They are mostly composed of a caseous substance composed of exfoliated cells and contain many cholesterol crystals.[7] Epidermoid cysts grow along the basal cisterns and often encircle peripheral cranial nerves or blood vessels, but they can also penetrate and harm normal brain tissue structure.[8]

Case Report

A 33-year-old gentleman presented to the casualty department with a chief complaint of aphasia, vomiting, and an inability to walk for the past five days. According to the attendant, he had been experiencing intermittent weakness on the right side, which led to his transfer to the hospital, where he underwent his first surgery—a left frontal craniotomy—four months ago and was diagnosed with ependymoma. Following this surgery, he developed dysphasia and right-sided weakness. A second surgery was performed 3 months after the first surgery, during which a left-sided VP shunt was placed. After the second procedure, he showed significant improvement; his dysphasia and weakness decreased, allowing him to communicate effectively and walk with the aid of a stick. However, for the last five days, he has been unable to speak and cannot walk. According to the attendant and previous medical documents, there is no evidence of comorbidities.

On examination, there was a healed shunt scar on the left lateral side of his head, and he was unable to communicate verbally. Patient was vitally stable, with a Glasgow Coma Scale (GCS) score of E4VaM6, totaling 10 out of 15. Pupils were bilateral, reactive, and symmetrical. Baseline power in both upper and lower extremities was 2/5 and 4/5, while the left side was intact. Reflexes were hyper-reflexive in the right upper and lower limbs, while normal reflexes were noted in the left upper and lower limbs. Clonus was present bilaterally, and plantar responses were mute on the right and down-going on the left. Notably, the VP shunt did not demonstrate adequate refilling and appeared to be blocked. The imaging results were systematically evaluated after the patient was hospitalized.

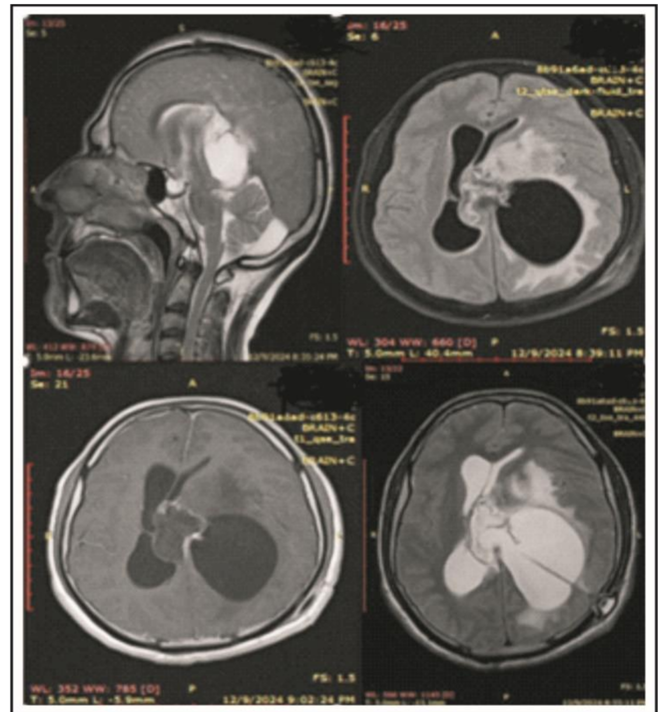

Figure 1: *Different MRI Sequences Showing Left Large Intraventricular Epidermoid Cyst with more entrapment of the left occipital horn of the lateral ventricle. (Permission taken to use the scan from patients)*

Given these results, the patient was definitively diagnosed with an intraventricular epidermoid cyst. Surgical resection was done endoscopically. The patient was positioned supine with the head turned to the right. After being scrubbed and draped, an incision was made along the previous VP shunt site, and the VP shunt was removed smoothly. An endoscope was then introduced through the previous VP shunt area, where nearly white flakes resembling a lesion were identified,

attached to the ventricular wall. The tumor was removed using a grasper and suctioned out. Hemostasis was secured, and an external ventricular drain (EVD) was placed. The skin was closed, and an airtight surgical dressing (ASD) was applied. EVD level was arranged at 12 mmHg. Patient mobilized the next day and he was able to walk independently. EVD was removed, and he was discharged.

The pathological diagnosis revealed multiple fragments composed of cyst lining of squamous epithelium with a granular layer containing lamellated keratin. Postoperative CT and MRI examinations showed that the mass had been grossly totally removed. The patient was able to walk independently the following day. He was followed up for 6 months postoperatively, and she continued to be in good health.

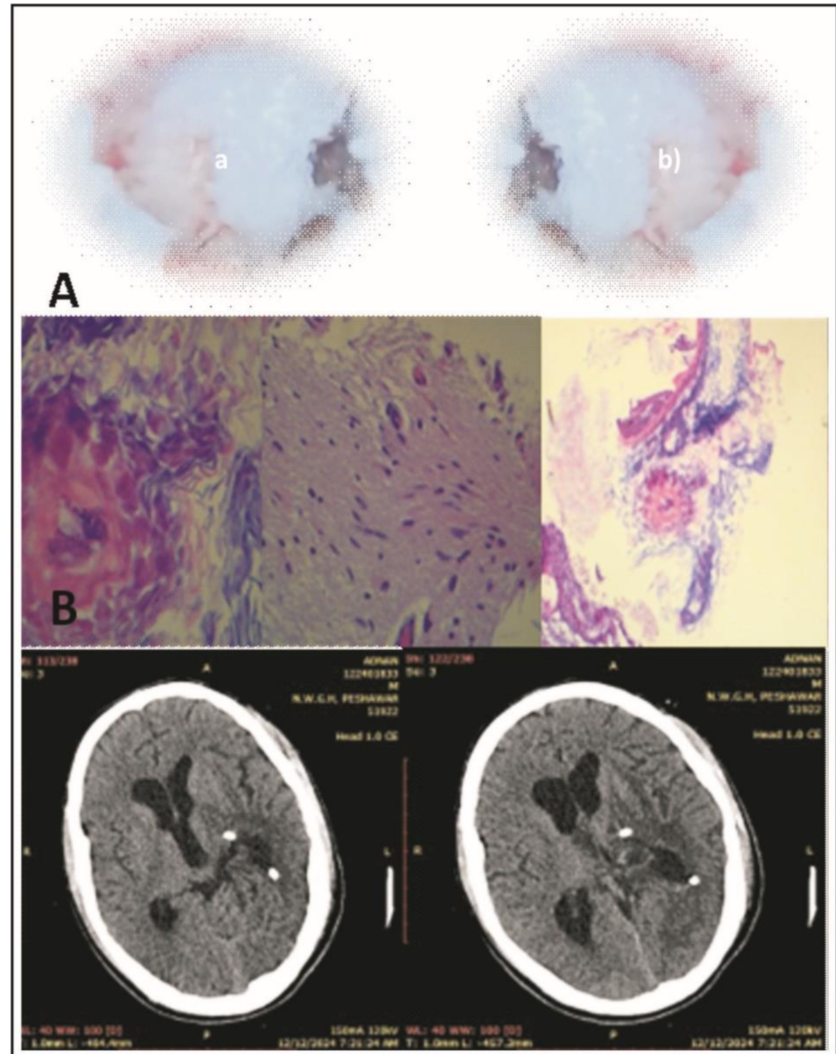

Fig. 2 (A): *Multiple irregular fragments of grayish brown soft tissue measuring 1x0.7x0. 4cm.* **2(B):** *H&E stained showing hypercellularity with keratin-filled cystic spaces lined by stratified squamous epithelium without atypia (Permission taken to use the scan from patients).*

DISCUSSION

Epidermoid cysts, also known as cholesteatoma, are relatively common among benign intracranial tumors.[9] In the CPA cistern, they rank as the third most prevalent tumor.[10] It is simple to overlook epidermoid cysts.[11] From the standpoint of imaging, epidermoid cysts are distinguished by uniformly high signal intensity in DWI without enhancement and low signal intensity in magnetic resonance T2-FLAIR sequences. Intraventricular epidermoid cysts frequently produce obstructive hydrocephalus, which is characterized by tumor development blocking the foramen of Monro, resulting in symptoms of excessive intracranial pressure, including headache and vomiting.[12] In particular, epidermoid cysts originating in the lateral and third ventricles are most likely to present with obstructive hydrocephalus[13]. The mainstay of treatment for intraventricular epidermoid cysts is surgical resection. It is important to remove them as completely as possible; otherwise, the tumor may recur, and the remaining epidermoid cyst may secrete inflammatory substances, causing fever and affecting cerebrospinal fluid circulation.[14] Intraventricular epidermoid cysts are characterized by their deep location, clear boundary, and limited

vascularity, and these are absolute indications for tumor removal using endoscopic techniques. Neuroendoscopy has the advantage of providing good illumination and allows close viewing of the cyst. Using endoscopic techniques, fistulation of the bottom of the third ventricle and the septum pellucidum can be easily performed, and cerebrospinal fluid circulation can be easily restored.[9,15] In this analysis, we reported a case of an epidermoid cyst originating in the lateral ventricle, which invaded the septum pellucidum and was initially diagnosed as ependymoma on initial histopathological assessment after surgery. The epidermoid cyst was characteristically hyperintense in the T2 MRI sequence, hypointense in T2-FLAIR, non-enhanced after enhancement, and hyperintense in the DWI sequence. The mass was removed by minimally invasive surgery using an endoscopic technique. A postoperative CT scan showed that the tumor had been grossly totally removed.

CONCLUSION

Intraventricular epidermoid cysts are very rare. Their diagnosis is simple and depends mainly on MRI examination. Surgical resection is preferred for treatment. Complete surgical resection is highly recommended. Lateral intraventricular epidermoid cysts are recommended for resection by minimally invasive surgery using a combination of microscopic and endoscopic techniques. The prognosis of such patients is very good.

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Additional Information

Ethics statement: The Northwest General Hospital and Research Centre's ethical committee gave its approval to the project. To take part in this study, the subjects gave their written informed consent. Participants gave their written approval for any potentially identifiable subjects covered in this article to be published in the future. Ethical Approval R/No. IRB&EC/ 2025-GH/0293

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AUTHOR'S CONTRIBUTIONS

Sr.#	Author's Full Name	Intellectual Contribution to Paper in Terms of:
1.	Faiqa Filza Khan	1. Study design and methodology, and paper Writing.
2.	Sohail Daud Khan	2. Literature review and data analysis.
3.	Ahmad Reshad Payenda	3. Data collection and calculations.
4.	Hazrat Nabi	4. Analysis of data and interpretation of results.
5.	Mohammad Naseem Afghan	5. Literature review and referencing.
6.	Sohail Daud Khan	6. Editing and quality insurer.