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Research paper

Surgery for Recurrence of An Epidermoid Cyst of The Cerebellopontine Angle: A Case Report And The Literature Review

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Abstract

Introduction: Epidermoid cysts of the cerebellopontine angle (APC) are rare benign tumours that generally recur after incomplete initial excision (1,3).
Observation: We report a case of recurrence of a right PCA epidermoid cyst in a 45-year-old patient, ten years after initial surgery. A retrosigmoid approach, using neuro-navigation and facial nerve monitoring, allowed controlled subtotal resection.
Results: The postoperative course was uneventful, with clinical improvement and no new deficits. Postoperative MRI showed a stable residue.
Conclusion: Surgery for recurrence of epidermoid cysts of the APC remains challenging due to capsular adhesions. Careful subtotal resection avoids neurological complications (3,11).

Keywords: *epidermoid Cyst; APC; Recurrence; Surgery; Neuro-Navigation.*

1. Introduction

Intracranial epidermoid cysts account for approximately 1% of brain tumours and are most commonly found in the APC (1,2). Their slow but infiltrative growth, as well as their strong adhesion to the cranial nerves and brain stem, make complete removal difficult (1,4).
Recurrence occurs in 5 to 25% of cases, mainly when residual capsule tissue is deliberately left behind to avoid neurological deficit (3,9).
This case report describes a late recurrence of an epidermoid cyst of the CPA, successfully operated on using modern technological assistance, including neuronavigation and facial nerve monitoring.

2. Clinical Observation

2.1. Clinical data

A 45-year-old man, who underwent surgery in 2015 for an epidermoid cyst of the right APC, consulted for occipital headaches, V2-V3 paraesthesia, right hypoacusis, and balance disorders.
A complete neurological and otological examination was performed, revealing a right cerebellar syndrome, hypoesthesia in the V2 territory, and a decreased corneal reflex, with no facial nerve deficit.

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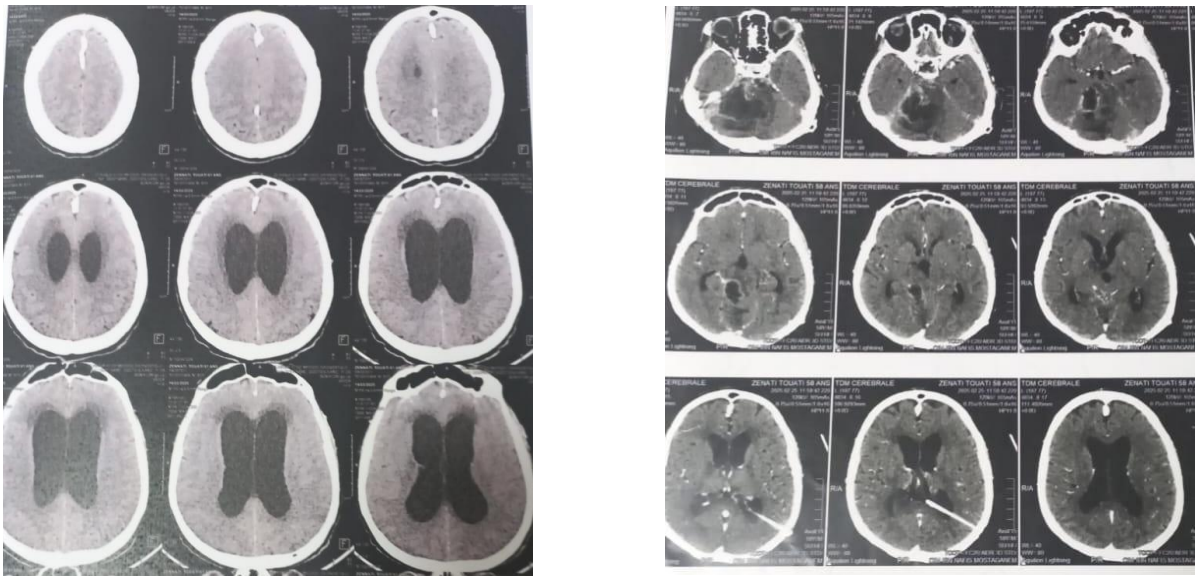


Fig. 1: The Examination Revealed Right Cerebellar Syndrome, V2 Hypoesthesia and Decreased Corneal Reflex. No Facial Deficit.

2.2. Imaging

MRI revealed a typical cystic lesion: hyperintense on diffusion, well described in the literature as characteristic of epidermoids [13].
Brain MRI, including diffusion-weighted sequences—considered the gold standard for the diagnosis of epidermoid cysts [13]—demonstrated a typical cystic lesion that was hyperintense on diffusion.
The tumour was in contact with the trigeminal (V), facial (VII), and vestibulocochlear (VIII) nerves and the lateral side of the brainstem, without associated hydrocephalus.

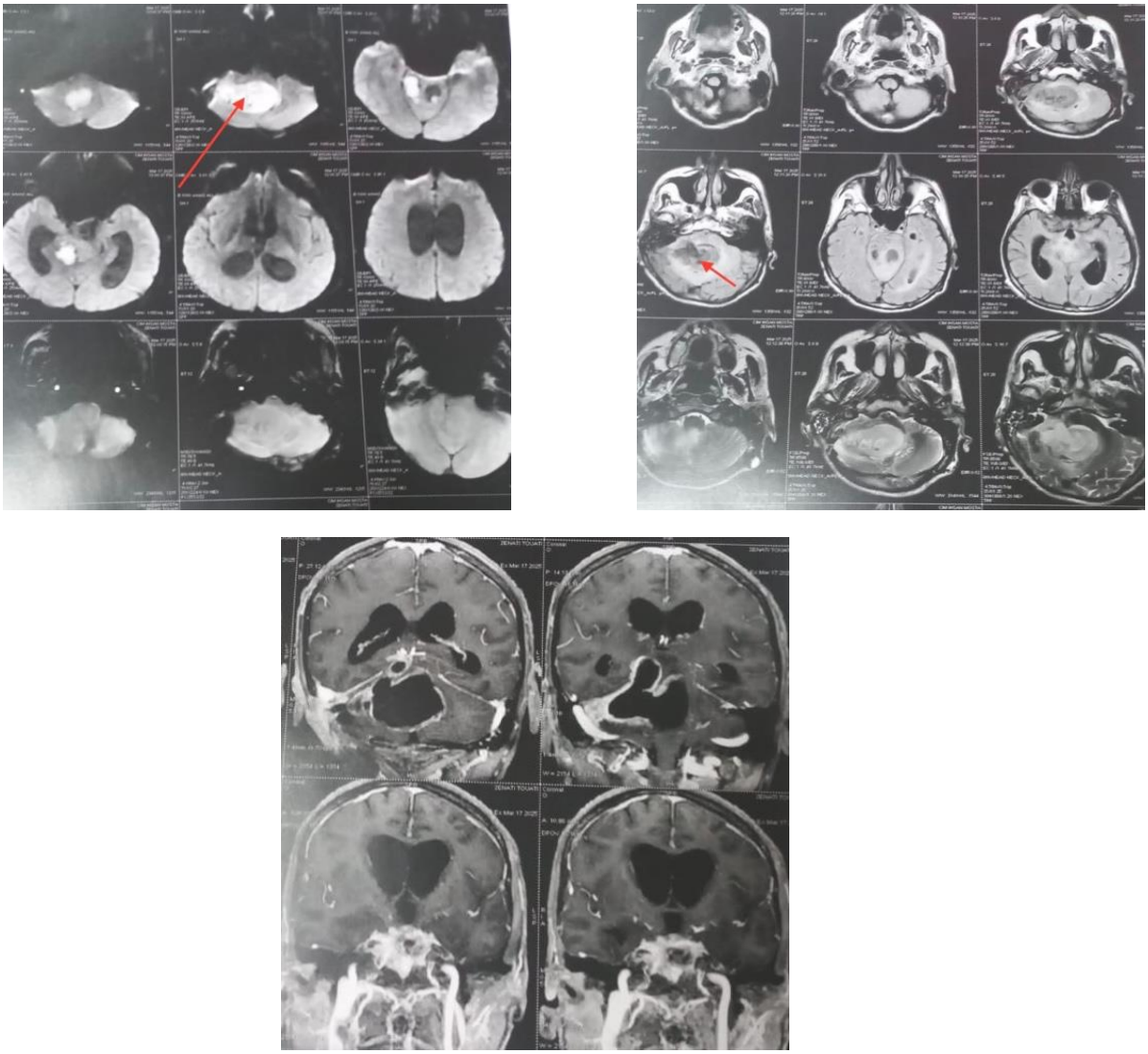


Fig. 2: Preoperative MRI Revealed A Tumor in the Cerebellopontine Angle with Imaging Characteristics Typical of an Epidermoid Cyst.

2.3. Surgical technique

Surgery was indicated based on the clinical presentation, radiological findings, and history of prior surgery.
The procedure was performed via a retrosigmoid approach, in the lateral position, under an operating microscope, with neuro-navigation and intraoperative neurophysiological monitoring, including facial nerve monitoring and brainstem auditory evoked potentials (PEA).

2.4. Operative time

Retrosigmoid craniotomy was performed, followed by opening of the dura mater and careful arachnoid dissection.
The characteristic pearly content of the lesion, corresponding to a keratinized matrix described in all series [1], [6], was evacuated.
Microscopic dissection of the capsule, which is strongly adherent to V, VII-VIII, and the brainstem, a phenomenon that is accentuated in cases of recurrence [3], [8], [11].
A controlled subtotal resection was achieved, deliberately leaving a fragment of the capsule in contact with the acoustic-facial bundle to avoid facial paralysis, a feared and frequent complication [5], [15].

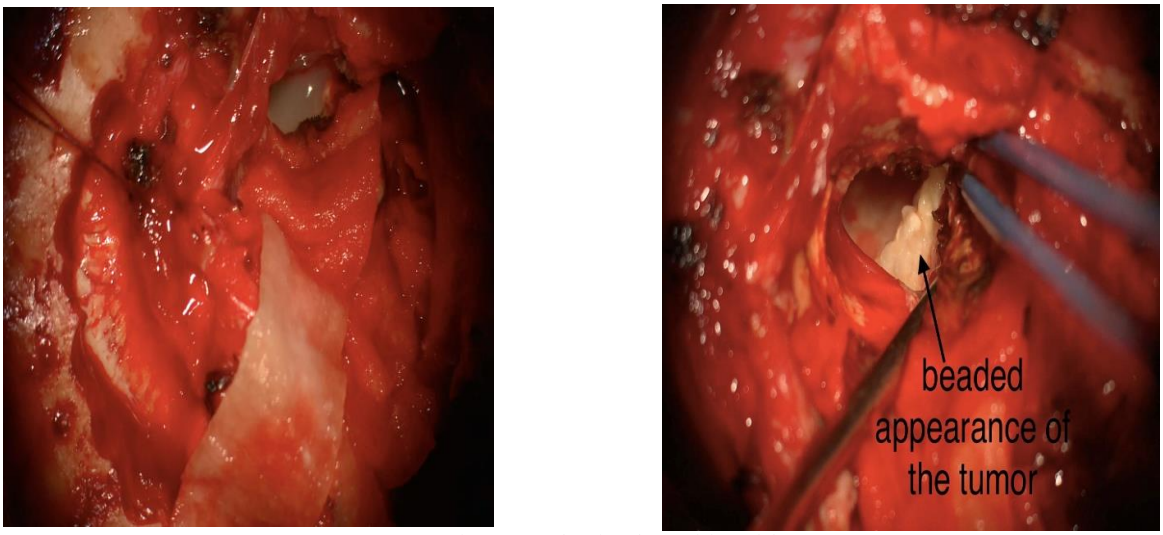


Fig. 3: Intraoperative Image Showing the Excision of the Tumor.

3. Results

The postoperative outcomes were straightforward:
No facial paralysis was observed despite reported rates of 10–25% depending on the series (5,15).
Headaches and imbalance disturbances improved, while V2 hypoesthesia remained stable.
No cerebrospinal fluid fistula or infection complication occurred.
Follow-up MRI performed at 3 months, in accordance with recommendations from several series (3,10), demonstrated stable residual disease, consistent with the expected behavior of capsular remnants.
Subtotal resection remains an accepted strategy in recurrent epidermoid cysts when the capsule is strongly adherent to critical neurovascular structures, as it allows functional preservation while limiting morbidity (3,8,11). Although the 3-month postoperative MRI follow-up may be considered relatively short for an article focused on recurrence, longer-term clinical and radiological surveillance is planned. These data are not yet available at the time of writing, but will be essential for assessing long-term tumor control.

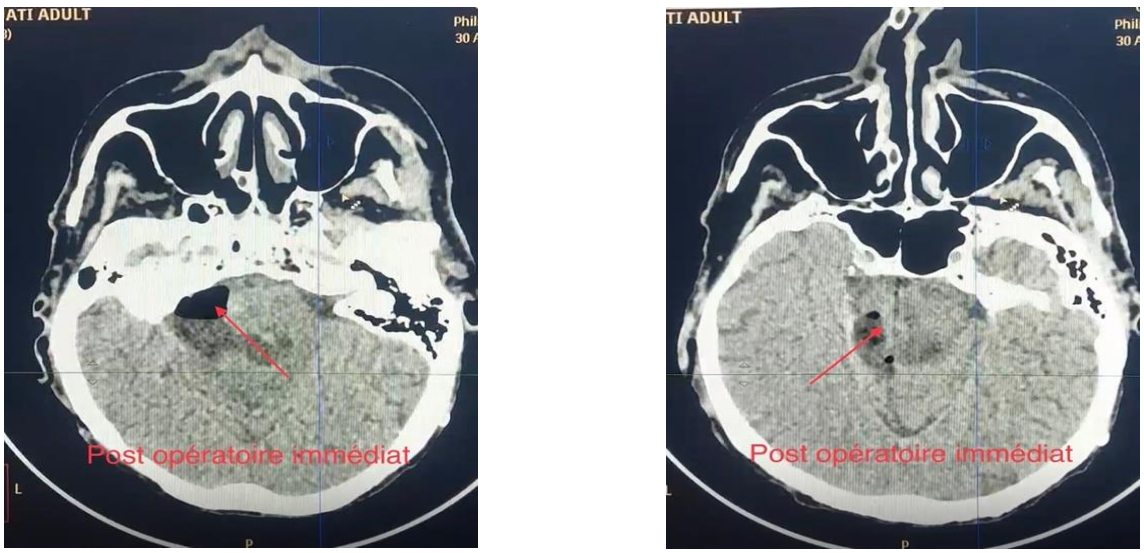


Fig. 4: Postoperative Orbital CT Confirmed the Surgical Approach and Complete Excision of the Tumor.

4. Discussion

APC epidermoids pose major surgical challenges due to their infiltration around the cranial nerves [1], [4].
Recurrence is associated with:
post-surgical fibrosis making dissection difficult [3], [9],
increased adhesion to neurovascular structures [3], [8],
a risk of complications, particularly on nerves VII and VIII [5], [15].
The surgical objective in these recurrences is no longer total excision at all costs, but maximum decompression while preserving neurological function [3], [11].
The use of a microscope, advanced endoscopy, and neurophysiological monitoring reduces the risk of sequelae [6], [7].
Several series have compared the outcomes of total versus subtotal resection in recurrent epidermoid cysts. While total resection is associated with lower recurrence rates, it also carries a significantly higher risk of cranial nerve morbidity, particularly involving nerves VII and VIII, especially in reoperative settings [2], [3], [5], [8], [15]. In contrast, subtotal resection has been shown to provide satisfactory long-term clinical control with reduced neurological complications, at the cost of a higher but often slow-growing residual lesion [3], [10], [11]. In the present case, a controlled subtotal resection was deliberately chosen because of strong adhesions to the acousticofacial bundle, in line with current recommendations favoring functional preservation over radical excision in recurrent disease. At short-term follow-up, the absence of neurological deterioration and the stability of the residual lesion are consistent with the outcomes reported in major series [3], [10], [11].

Table 1: Recurrence Rates and Surgical Outcomes of Major Series on Cerebellopontine Angle Epidermoid Cysts

Study	Number of patients	Type of resection	Recurrence rate	Major complications
Samii et al, 1996 (1)	50	Total / Subtotal	4–10% (total), 15–25% (subtotal)	Facial nerve palsy, hearing loss
Noudel et al., 2009 (3)	42	Subtotal	15% (long-term)	Facial nerve palsy, auditory complications
Mohanty et al. , 1997(8)	35	Total	5%	Facial nerve palsy, hearing loss
Crespo et al 2020 (11)	28	Controlled subtotal	18%	Facial nerve function was preserved due to partial resection
Sweeney et al., 2013(15)	60	Total / Subtotal	10 – 20%	Facial nerve palsy 10–25%, hearing loss
Gopalakrishnan et al., 2013 (10)	37	Subtotal	17%	Rare complications, mainly functional

From a long-term perspective, the risk of delayed recurrence, even after apparently complete or stable subtotal resection, underscores the necessity of prolonged, and often lifelong, radiological surveillance using MRI, as emphasized in several series [3], [9], [10], [14]. Patients should be clearly informed of the slow-growing nature of residual epidermoid tissue and the potential for late recurrence, sometimes occurring many years after surgery [2], [3]. This highlights the importance of patient education and adherence to long-term follow-up protocols, as well as individualized decision-making balancing the extent of resection against functional preservation, particularly in recurrent cases involving critical neurovascular structures [3], [11], [15].
Criteria for reintervention in recurrent cerebellopontine angle epidermoid cysts should be based on a combination of clinical and radiological factors. Progressive neurological symptoms, documented growth of residual lesions on serial MRI, and evidence of brainstem or cranial nerve compression are generally considered the main indications for reoperation [2], [3], [10], [11]. In contrast, asymptomatic and stable residual disease may be managed conservatively with close clinical and radiological surveillance, particularly in patients at higher risk of surgical morbidity [3], [5], [15].

5. Conclusion

Surgery for recurrence of a squamous cell carcinoma of the APC is difficult and requires a cautious strategy.
Controlled subtotal resection is often the best option to avoid neurological deficits while ensuring good clinical control.
Long-term MRI follow-up is essential.

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