



Fig. 1 Pre- (A) and post-aspiration (B) sagittal T1-weighted; and pre-aspiration T2-weighted (C) MRI showing cyst reduction and drainage catheter.

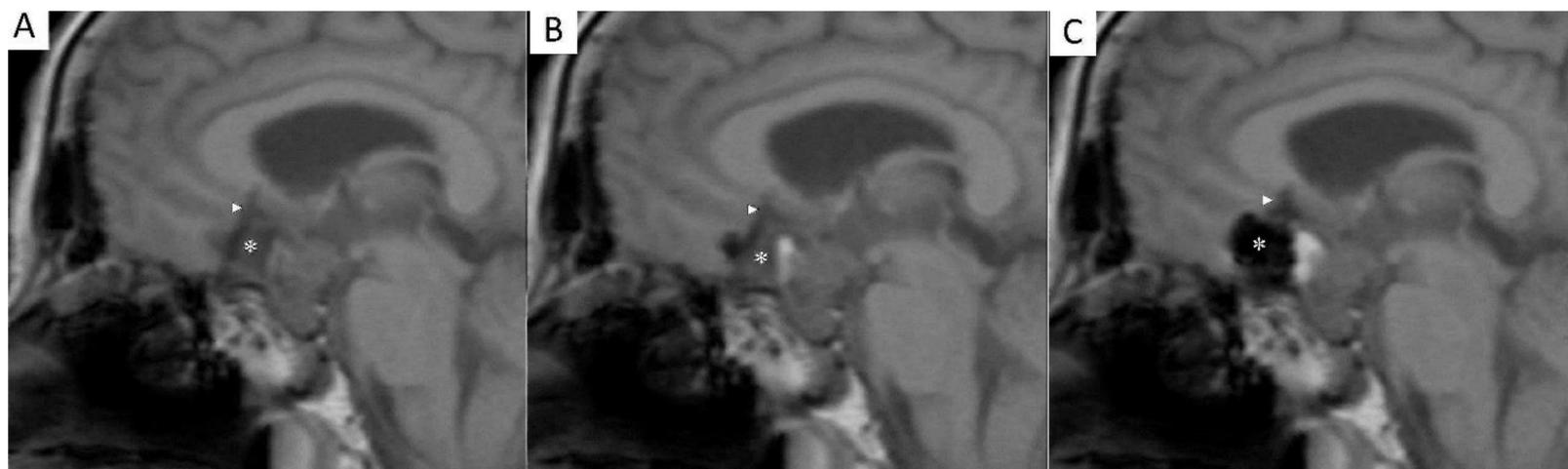


Fig. 2 Sequential FLASH images demonstrating cyst decompression during aspiration with increasing air space.

Introduction

Craniopharyngiomas are rare benign epithelial tumors of the sellar and suprasellar region, accounting for less than 5% of all intracranial neoplasms. Standard management typically involves surgical resection followed by adjuvant radiotherapy when indicated. However, recurrent cystic variants pose significant challenges due to their location, critical neurovascular adherence, and higher morbidity of repeat surgical intervention. Minimally invasive, image-guided strategies may offer an alternative for select patients. Herein, we report a case of recurrent cystic craniopharyngioma managed via intraoperative real-time magnetic resonance imaging (MRI) and neuronavigation-guided transnasal aspiration.

Methods and Materials

A transnasal approach was executed using neuronavigation and an external ventricular drainage (EVD) catheter. Intraoperative real-time MRI using fast low-angle shot (FLASH) sequences provided continuous visualization to guide catheter placement and monitor cyst decompression.

The procedure was performed under general anesthesia using standard sterile technique, and histopathological examination of the aspirated material was conducted.

Case Description

We present a 77-year-old female with a history of endoscopic transnasal resection of an adamantinomatous craniopharyngioma presented with a recurrent suprasellar cystic lesion. (**Fig. 1**) Given the patient's age and comorbidities, conventional reoperation was considered high risk. The recurrent cyst was accessed transnasally using an EVD catheter under neuronavigation guidance, and real-time MRI (FLASH sequences) enabled continuous visualization of the aspiration and decompression. (**Fig. 2**) The procedure was completed without complication, and immediate postoperative imaging confirmed significant volume reduction.

Discussion

MRI-guided interventions are increasingly used for biopsy, drainage, and lesion localization, improving accuracy while reducing invasiveness.

In recurrent cystic craniopharyngioma, reoperation is challenging due to scarring and anatomical distortion. Real-time MRI-guided catheter aspiration enables precise targeting and immediate verification of decompression, offering a safer alternative in high-risk patients.¹⁻⁵ Despite limitations related to cost and availability, it is a valuable option in centers with intraoperative MRI.

Conclusion

Real-time MRI-guided transnasal cyst aspiration is a safe, minimally invasive treatment for recurrent cystic craniopharyngioma. It provides accurate targeting, continuous intraoperative monitoring, and immediate verification of cyst decompression while minimizing surgical risk. This technique may be particularly beneficial in elderly patients or those with comorbidities where repeat open surgery is contraindicated or carries increased morbidity. Further studies may help establish the role of image-guided cyst aspiration as a first-line strategy in select cases of recurrent craniopharyngioma.

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