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Case Report & Case Series

Endoscopic-assisted identification of residual tumor after apparent gross-total resection of giant intracranial epidermoids☆

Carlito Lagman [a,*], Hiren Patel [c], Timothy T. Bui [a], Seung J. Lee [a], Ian J. Brown [c], Daniel T. Nagasawa [a], Isaac Yang [a,b], Alan R. Turtz [c]

[a] Department of Neurosurgery, University of California, Los Angeles, 300 Stein Plaza, Los Angeles, CA 90095, United States
[b] Jonsson Comprehensive Cancer Center, University of California, Los Angeles, 10833 Le Conte Ave, Los Angeles, CA 90024, United States
[c] Department of Neurosurgery, Cooper University Hospital, Three Cooper Plaza, Camden, NJ 08103, United States

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ABSTRACT

Giant intracranial epidermoids (giant IEs) often extend into multiple compartments within the cranial vault and if tumor fragments are left behind during resection, recurrence is inevitable. The endoscope can be used to identify residual epidermoid and help achieve safe, maximal resection. We present two patients with giant IEs who underwent resections. The endoscope was used in final measure to survey the surgical beds. Residual tumors were identified in both cases, and further resections were performed. This report highlights the importance of an endoscopic survey after apparent gross-total resection of giant IEs.

1. Introduction

Intracranial epidermoids (IEs), also known as "pearly tumors," are thought to arise from improper ectodermal inclusions during neural tube formation [1]. The neoplastic constituent of the epidermoid is the capsule, which is composed of a layer of keratinizing squamous epithelium. This layer desquamates into the cyst resulting in expansion of the cyst, and if the capsule is left behind, recurrence is inevitable. The use of an endoscope in the resection of giant IEs is not new, but the added step of an endoscopic survey to identify residual epidermoid has yet to be emphasized in the literature. This final step has become integral in resection of IEs by the senior author (AT). We herein present two cases of giant IEs resected at our institution and focus on the technical aspects involved in excision of these cysts.

2. Case illustration

2.1. History and examination - patient 1

A 28-year-old African-American female with a 4-year history of seizures and prior resection of a giant IE re-presented with severe headaches. Brain magnetic resonance imaging (MRI) demonstrated a giant recurrent IE (Fig. 1A–D). The mass measured 6.5 × 8.0 × 7.2 cm (from 5.7 × 7.8 × 7.2 cm, 2 years ago).

2.2. Surgery and postoperative course - patient 1

A right-sided craniotomy was performed. The epidermoid was visualized as typical pearly white and waxy. The operative microscope facilitated a meticulous, circumferential dissection along the capsule (Fig. 2A–L). Visualization became limited upon entering the contralateral occipital horn, after which a 30-degree endoscope was introduced into the operative field and used to identify residual epidermoid. Further resection was aided by angled Rhoton instruments, particularly the Rhoton 18. The depth and angle of the endoscope were adjusted dynamically to optimize visualization of the Rhoton instrument, which was used to delicately tease the remaining fragments off normal brain tissue. A final endoscopic survey of the surgical bed was performed and the surgical cavity was flushed with steroid-infused irrigating solution. The incision was closed in standard fashion. Immediate postoperative MRI and an 8-month surveillance scan (Fig. 3A–D) demonstrated a satisfactory

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* Corresponding author at: Department of Neurosurgery, University of California, Los Angeles, 300 Stein Plaza, Ste. 554B, 5th Floor Wasserman Bldg., Los Angeles, CA 90095-6901, United States.
E-mail addresses: carlitolagman@mednet.ucla.edu, carlitolagman@gmail.com (C. Lagman).

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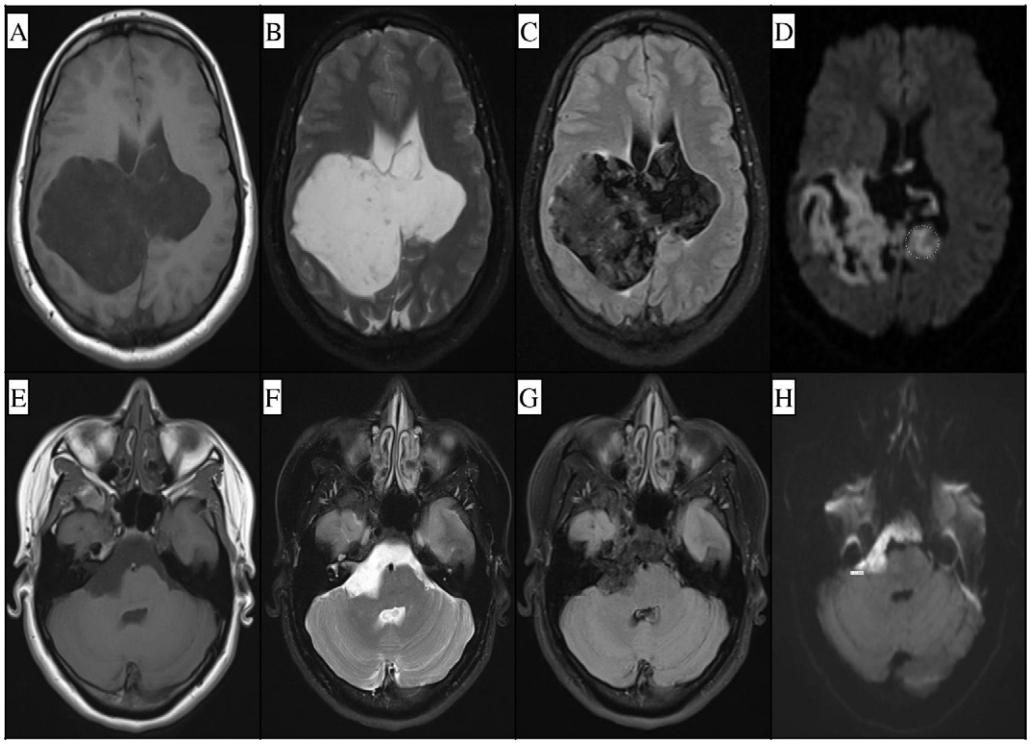

Fig. 1. Preoperative T1/T2/FLAIR/DWI images for patient 1 (A–D) and patient 2 (E–H).

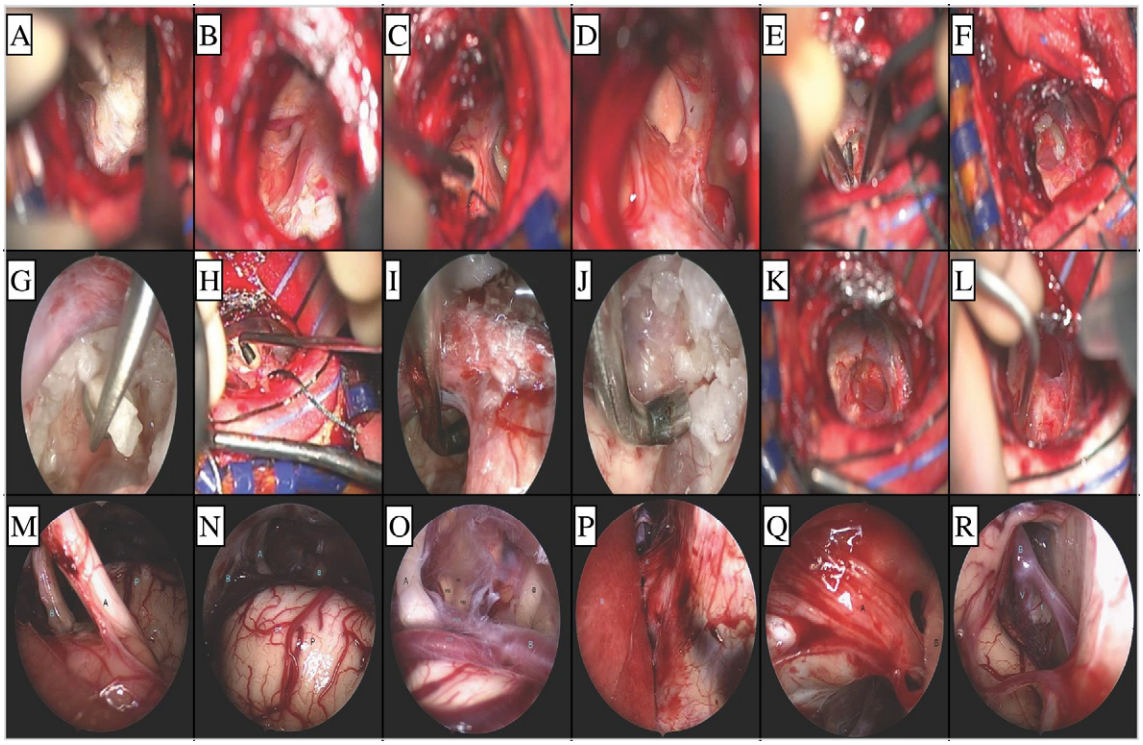

Fig. 2. Intraoperative images for patient 1 (A–L) and patient 2 (M–R). Microscopic view, right hemisphere (A), left hemisphere (B), same as (B) after additional tumor resection (C), magnified view of (C) (D), angled sucker working in a blind spot (E), persistent tumor (F), endoscopic view, residual tumor in microscopic blind spot (G), microscopic view similar to (E) (H), endoscopic view, angled sucker in blind spot (I), 30-degree scope view (J), microscopic view, across contralateral (left) resection cavity (K), antibiotic irrigation (L). A – 7/8 complex, B – 5th nerve, P – pons (M), A – right 3rd nerve, a – left 3rd nerve, B – right 4th nerve, P – pons (N), A – right 3rd nerve, a – left 3rd nerve, B – basilar artery, SCA – superior cerebellar artery, PCA – posterior cerebellar artery, MB – mammillary body, ML – membrane of Liliequist, f – fragment of epidermoid identified prior to resection (O), A – 9/10/11 complex, B – cottonoid over right cerebellar hemisphere (P), A – 9/10/11 complex, B – cottonoid over right cerebellar hemisphere (Q), B – basilar artery, V – vertebral artery, f – fragment of epidermoid identified prior to resection (R).