



## Introduction

Injury to the internal cerebral vein (ICV) during neurosurgical procedures is exceedingly rare and poorly characterized. The deep cerebral venous system—including the paired ICVs—drains the thalami, basal ganglia, corpus callosum, and deep white matter before converging into the vein of Galen. Because of their location along the roof of the third ventricle, the ICVs are particularly vulnerable during surgical approaches to pineal and posterior third ventricular lesions.

Historically, iatrogenic ICV injury has been considered catastrophic due to the presumed inevitability of bilateral thalamic venous infarction and poor neurological outcome. However, the natural history and long-term outcomes following direct surgical sacrifice of an ICV—particularly in pediatric patients—remain largely unknown.

## Objective

To describe the clinical course, imaging evolution, and functional recovery following intraoperative sacrifice of the right internal cerebral vein during resection of a pineal region epidermoid cyst, and to provide insight into the natural history and prognosis of iatrogenic deep venous injury.

## Case Description

A neurologically intact 14-year-old male presented with progressive headaches associated with Valsalva and positional symptoms. MRI demonstrated a diffusion-restricting, non-enhancing pineal region mass consistent with an epidermoid cyst, with documented interval growth on serial imaging (Figure 1).

The patient underwent resection via a supracerebellar, infratentorial approach. During tumor dissection, a poorly visualized branch of the right internal cerebral vein was avulsed due to dense tumor adherence. Despite conservative hemostatic attempts, sacrifice of the right ICV was required for bleeding control. The patient remained hemodynamically stable throughout the procedure.

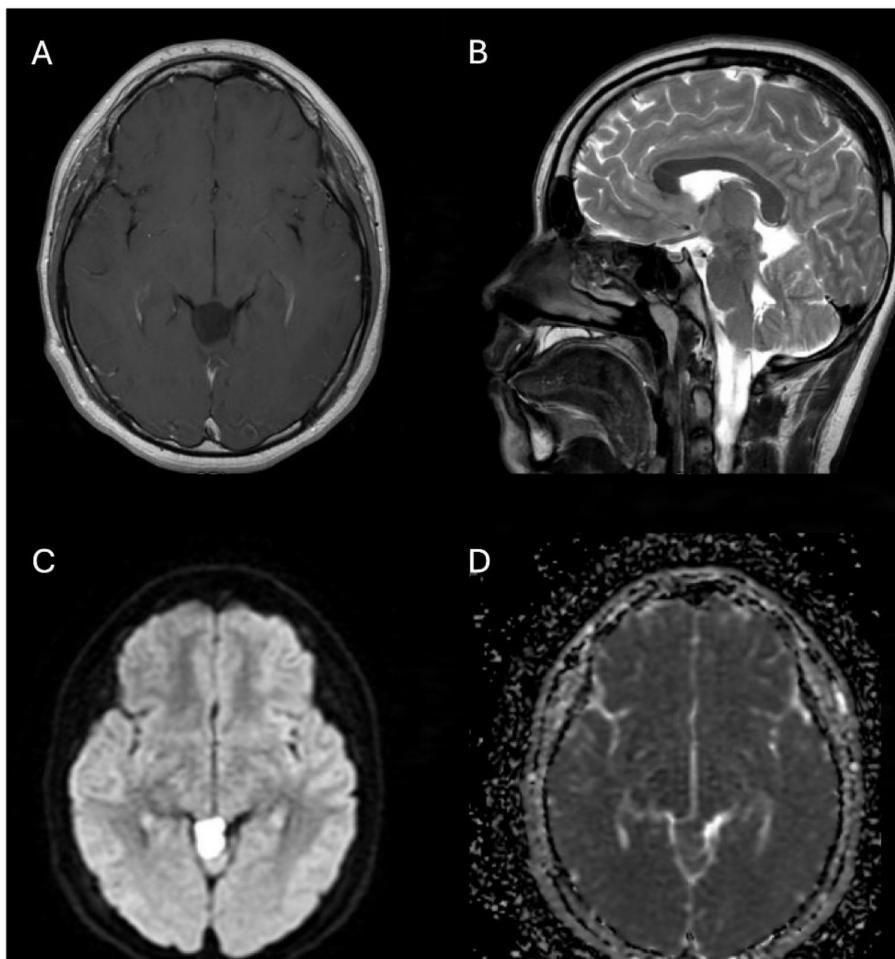


Figure 1. Preoperative imaging showing a pineal region epidermoid cyst. (A) axial contrasted T1 sequence, (B) sagittal T2 sequence, (C) apparent diffusion coefficient MRI sequence, (D) diffusion weighted MRI sequence

## Postoperative Course & Outcome

Postoperatively, the patient developed bilateral thalamic infarcts with associated neurological deficits, including:

- Left-sided hemiparesis
- Mutism
- Dysphagia requiring gastrostomy tube placement

Early postoperative imaging demonstrated acute infarction involving the bilateral thalami and splenium of the corpus callosum (Figure 2). Despite severe initial deficits, the patient demonstrated substantial recovery with supportive management and multidisciplinary rehabilitation:

- 6 weeks: Near-complete motor recovery; gastrostomy tube removed; returned to school
- 3 months: Minimal residual weakness
- 8 months: Normal neurological examination with no residual deficits

Follow-up imaging at eight months confirmed expected stroke evolution and chronic thrombosis of the right ICV without new complications (Figure 2C-D).

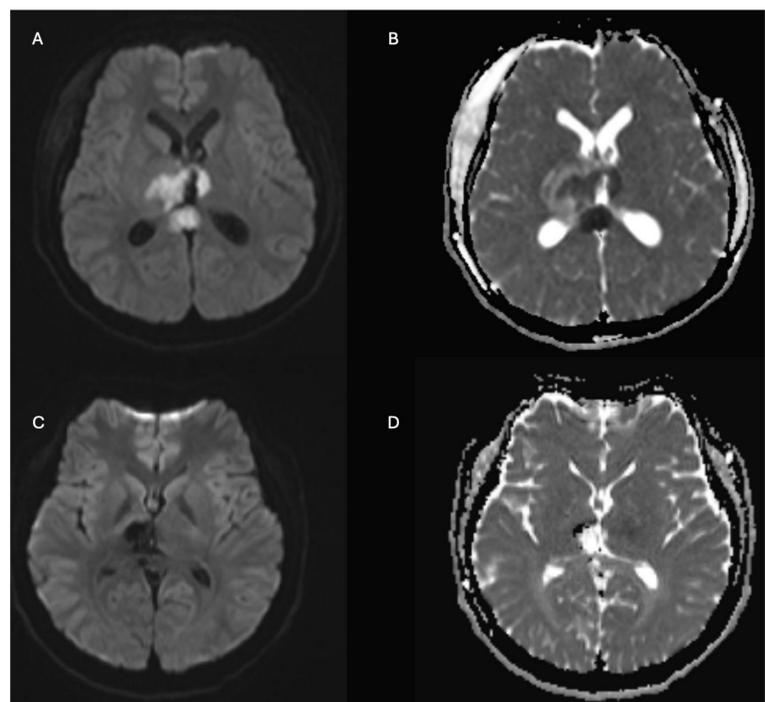


Figure 2. Postoperative imaging showing bilateral thalamic and posterior corpus callosum strokes immediately postop (A and B) and eight-months postop (C and D). (A-C) diffusion weighted MRI sequence, (B-D) apparent diffusion coefficient MRI sequence

## Discussion

The bilateral thalamic involvement correlated clinically with hypersomnolence and mutism, consistent with injury to the paramedian and intralaminar thalamic nuclei involved in arousal and speech initiation. While bilateral thalamic venous infarction is classically associated with devastating outcomes, this case demonstrates that deficits may be transient, particularly in pediatric patients.

Existing literature on ICV injury largely focuses on thrombotic occlusion, not direct surgical sacrifice, with reported outcomes ranging from mild symptoms to death. This case suggests that collateral venous drainage, contralateral compensation, and neuroplasticity may mitigate long-term morbidity in select patients.

## Conclusions

- Iatrogenic injury to the internal cerebral vein, while initially morbid, may be survivable with meaningful neurological recovery
- Pediatric patients may demonstrate substantial resilience following deep venous injury
- Early postoperative imaging, hemodynamic optimization, and aggressive multidisciplinary rehabilitation are critical to recovery
- This case adds novel insight into the natural history of ICV sacrifice and challenges the assumption that deep venous injury uniformly results in devastating outcomes.

## Contact

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