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Technical Notes & Surgical Techniques

Hemorrhagic infarction secondary to cerebral venous thrombosis

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ABSTRACT

Cerebral venous thrombosis (CVT) is an uncommon cause of hemorrhagic stroke. A 47-year old woman presented with acute-onset global aphasia and right hemiplegia. Head CT revealed a large left frontoparietal hematoma with significant mass effect. Emergency decompressive hemicraniectomy and hematoma evacuation were thus indicated. Intraoperatively, an occlusive thrombus was identified in the superior anastomotic vein of Trolard, confirming the diagnosis of CVT. While hemorrhagic CVT is not a rare entity, the diagnosis is not usually made intraoperatively. More interestingly, the authors provide intraoperative photographs of the occlusive thrombus in the vein of Trolard, overlying the area of hemorrhage, which they believe are unique and compelling clinical images.

1. Introduction

Cerebral venous thrombosis (CVT) comprises under 1% of cerebral infarction etiologies [1] and has only been mentioned a handful of times in the literature [1–3]. Given its ambiguous and varied presenting symptoms [4], detecting CVT remains a challenge and diagnosis is rarely made intraoperatively. Here we present a unique case of CVT that was identified intraoperatively and present compelling intraoperative photographs.

2. Case report

A 47-year old woman, who six weeks prior to presenting to our emergency department underwent an abdominal myomectomy for uterine leiomyoma, developed sudden-onset global aphasia and right hemiplegia, with a rapidly diminishing level of consciousness. The patient also had a history of prolactinoma, (on cabergoline therapy), previous in-vitro fertilization treatment using gonadotropins, and was undergoing workup for unexplained thrombocytopenia (platelet count: 40k–80k/mm^3). Her head CT (Fig. 1: A) revealed a large left frontoparietal hematoma with massive surrounding cerebral edema and mass effect. CT angiography showed no underlying aneurysm, vascular malformation, arterial stenosis or occlusion. The patient underwent emergency decompressive hemicraniectomy and evacuation of the intracerebral hematoma (Fig. 1B: postoperative head CT). Intraoperatively, an occlusive thrombus in the superior anastomotic vein of Trolard, a major cerebral vein in the vicinity of the hematoma, was identified (Fig. 1 arrows in C and D), leading to the diagnosis of cerebral venous thrombosis. Pathology revealed a hematoma with no evidence of amyloid angiopathy. Postoperatively, her mental status improved substantially and she was successfully extubated. Her speech comprehension improved significantly, although she had residual expressive aphasia. She remained with a dense right hemiparesis and was transferred to a rehabilitation facility. No neuropsychiatric testing was obtained. Over the following months her hemiparesis had improved achieving anti-gravity. She ultimately underwent an uneventful cranioplasty four months later.

3. Discussion

To the best of our knowledge this is the first diagnosis of CVT made intraoperatively and is documented by intraoperative photographs. CVT is a significant cause of stroke in young adults, especially women of childbearing age. Its increased incidence in this population has been linked to oral contraceptive use, pregnancy, and postpartum, all of which are known risk factors for venous thromboembolism [1,5]. For the patient reported here, a hypercoagulable state was most likely induced by her recent abdominal surgery for uterine leiomyomas. Additionally, prolactinomas have been previously linked to venous thromboembolism [6]. It could be argued that the white-appearing intravascular thrombus is likely platelet-rich. However, the authors believe that the gross appearance of a thrombus does not necessarily

Abbreviations: CTV, computed tomography venogram; CVT, cerebral venous thrombosis; MRV, Magnetic Resonance Venography

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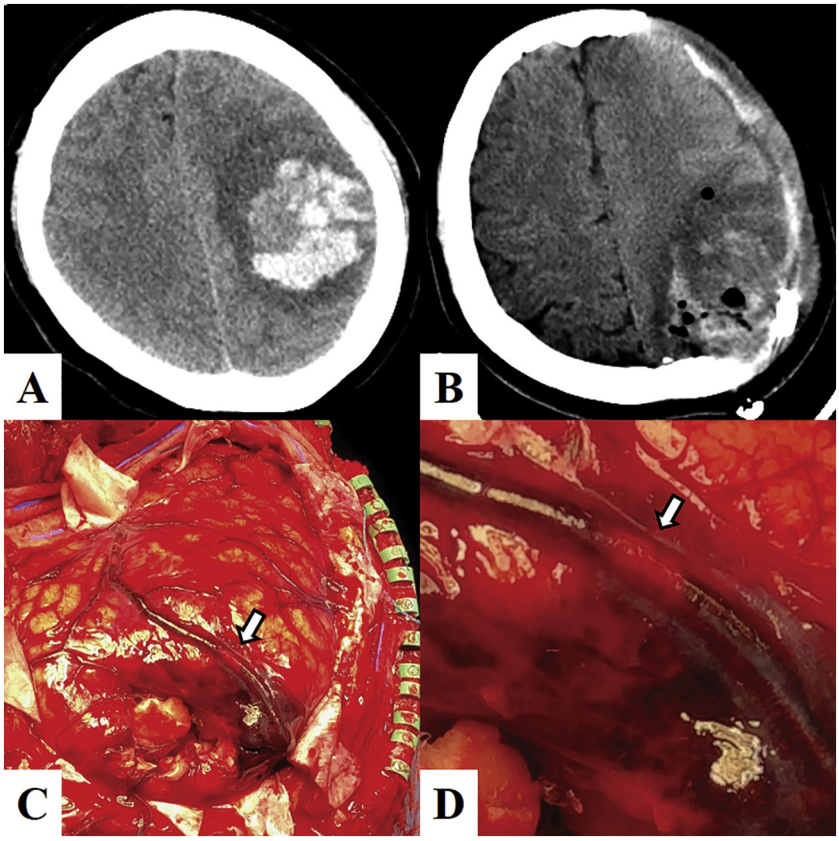

Fig. 1. A, Preoperative head CT reveals large left frontoparietal hematoma. B, Postoperative head CT after decompressive hemicraniectomy and hematoma evacuation. C and D, Intraoperative photographs demonstrate an occlusive thrombus in the superior anastomotic vein of Trolard, overlying the area of hemorrhage.

predict the composition of the clot. Whether thrombocytopenia was a risk factor for thromboembolism in this case is unclear especially given that it was chronic in nature and of an unclear etiology.

While CVT often involves intracranial dural sinuses, isolated cortical venous thrombosis has been rarely reported, occasionally involving the superior anastomotic vein of Trolard [1]. The majority of CVT cases are mild, causing limited cerebral venous infarction with varying degrees of edema and/or hemorrhage, and usually respond well to supportive medical therapy and systemic anticoagulation [1,5]. However, significant intracranial mass effect can occasionally occur, leading to life-threatening transtentorial herniation and mandating emergency decompressive surgery [7]. In stable patients, the diagnosis of CVT is typically confirmed using noninvasive venography, such as MRV (Magnetic Resonance Venography) or CTV (computed tomography venogram), rarely necessitating catheter angiography [5]. However, in emergency situations, there is little time for etiological workup. In such cases, the diagnosis of CVT is often made postoperatively or exceptionally, as in this case, the thrombus is perceptible to the naked eye and is made intraoperatively.

4. Conclusion

To the best of the authors' knowledge, neither intraoperative diagnosis of CVT nor intraoperative photographs of an occlusive thrombus in the vein of Trolard, in the setting of hemorrhagic CVT, have been previously published.

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