MECHANICAL THROMBECTOMY FOR CEREBRAL VENOUS THROMBOSIS IN A YOUNG FEMALE ON ORAL CONTRACEPTIVE

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ABSTRACT:
Introduction: Cerebral venous thrombosis (CVT) is a rare but potentially fatal condition, often associated with hypercoagulable states such as oral contraceptive use. Prompt recognition and intervention are essential to prevent severe neurological complications.
Case Report: We report the case of a 33-year-old female on oral contraceptives who presented with severe headaches, recurrent vomiting, and subsequent seizures. Magnetic resonance imaging (MRI) and magnetic resonance venography (MRV) confirmed extensive dural sinus thrombosis involving the superior sagittal sinus and right sigmoid sinus. Despite initial anticoagulation, her neurological status deteriorated, necessitating urgent mechanical thrombectomy.
Discussion: Digital subtraction angiography (DSA) confirmed extensive CVT. A combined approach using a Solitaire X stent retriever and aspiration catheters achieved substantial clot removal, resulting in improved venous drainage. Post-procedure MRI demonstrated partial recanalization without infarction or hemorrhage. The patient exhibited significant neurological improvement and was discharged on anticoagulation therapy with complete recovery at follow-up.
Conclusion: This case underscores the importance of early diagnosis and multidisciplinary management in CVT. Mechanical thrombectomy is an effective treatment modality for extensive CVT when anticoagulation alone is insufficient. A combination of aspiration and stent retrieval techniques enhances recanalization rates and improves patient outcomes

Keywords: Mechanical thrombectomy, Cerebral venous thrombosis, Digital subtraction angiography

INTRODUCTION

Cerebral venous thrombosis (CVT) is a rare condition with potentially fatal outcomes. The incidence ranges from 13.2 to 15.7 per million patients per year (1). It occurs when a blood clot forms within the cerebral venous sinuses, leading to increased intracranial pressure, venous infarction, or haemorrhage. The aetiology of CVT is broad, encompassing hypercoagulable states, oral contraceptive use, malignancies, infections, and other factors (2).

This case report discusses the presentation, management, and outcome of a 33-year-old female on oral contraceptives who was diagnosed with CVT. She initially presented with headaches and vomiting, followed by seizures. Mechanical thrombectomy successfully recanalized the cerebral venous sinuses.

This case illustrates the techniques used in the treatment of this life-threatening condition.

CASE REPORT

A 33-year-old female, nulliparous, on oral contraceptives for irregular menses, initially presented with severe headaches and recurrent vomiting (more than 10 episodes per day). Given her clinical presentation, an urgent Magnetic Resonance Imaging (MRI) brain was performed, revealing extensive dural venous thrombosis from the superior sagittal sinus to the right sigmoid sinus. No obvious signs of increased intracranial pressure, venous infarction, or haemorrhage were noted (Figure 1 and 2). The patient was subsequently referred to our centre for urgent mechanical thrombectomy. Upon arrival at our centre, the patient was lethargic, with slight left-sided weakness (power 4/5). While awaiting intervention in the angio suite, she experienced a seizure and required intubation. She was treated with intravenous Levetiracetam (Keppra) 3.6 g. A digital subtraction angiography (DSA) of the cerebral veins confirmed extensive dural sinus thrombosis.

Given the cerebral oedema and the potential for haemorrhagic transformation, emergency mechanical thrombectomy was performed. Since full recanalization through anticoagulation was uncertain, urgent endovascular intervention was warranted. Digital subtraction angiography (DSA) on venous phase revealed abnormal sagittal sinus opacification, complex drainage patterns of cortical veins at the right supratentorial sinus, deep cerebral venous drainage towards the internal jugular veins indicating alternative drainage pathways, venous convergence into the right proximal sigmoid sinus, and near-normal venous drainage on the left side (Figure 3). A Neuron Max 88 (Penumbra, Inc., Alameda, USA) guiding catheter was positioned in the right proximal sigmoid sinus. A Solitaire X stent retriever (Medtronic, Irvine, USA) was deployed, achieving substantial clot removal. Additional aspiration using a RED 72 catheter (Penumbra, USA) and 3MAX aspiration catheter achieved approximately 70% clot removal, improving venous drainage. Complete recanalization of the anterior sagittal sinus was eventually achieved using a combination of stent retriever and aspiration techniques. Estimated blood loss during the procedure was minimal.

Post-thrombectomy MRI showed partial recanalization, with residual thrombus but no new infarction or haemorrhage. The patient was extubated the following day and showed significant neurological improvement. Intracranial pressure monitoring was not performed during the procedure. The patient was administered subcutaneous Enoxaparin (Clexane) 1 mg/kg twice daily for five days, followed by Dabigatran (Pradaxa) 150 mg twice daily for six months. Antiepileptics were continued with Levetiracetam (Keppra) 500 mg twice daily.

DISCUSSION

CVT commonly involves the superior sagittal and transverse sinuses. The International Study on Cerebral Vein and Dural Sinus Thrombosis (ISCVT) has demonstrated that patients typically present with multiple risk factors. Oral contraceptives, hypercoagulability, infections, and dehydration are major contributors.

Different techniques have been described for CVT treatment, including Fogarty balloon thrombectomy, balloon angioplasty and stenting,

AngioJet thrombectomy, intrasinus thrombolysis, Direct Aspiration First Pass Technique (ADAPT), and Stent Retriever Assisted Vacuum-locked Extraction (SAVE). Mechanical thrombectomy has shown promising results in extensive CVT with high recanalization rates.
The patient showed complete recovery and was discharged on oral Rivaroxaban (Xarelto) 20 mg daily and Levetiracetam (Keppra) 500 mg twice daily, with follow-up at the neurology clinic.

CONCLUSION

This case highlights key aspects of CVT management. Early detection and prompt intervention are crucial. Mechanical thrombectomy, particularly the combination of aspiration and stent retrieval, is effective in cases of extensive CVT. Multidisciplinary collaboration involving emergency physicians, radiologists, and interventional neuroradiologists is essential for optimal patient outcomes. Radiologists play a critical role in early CVT detection using imaging modalities such as MRI, MRV, and CT venography.

CONFLICTS OF INTEREST

The authors have declared no conflicts of interest.

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FIGURE LEGENDS:

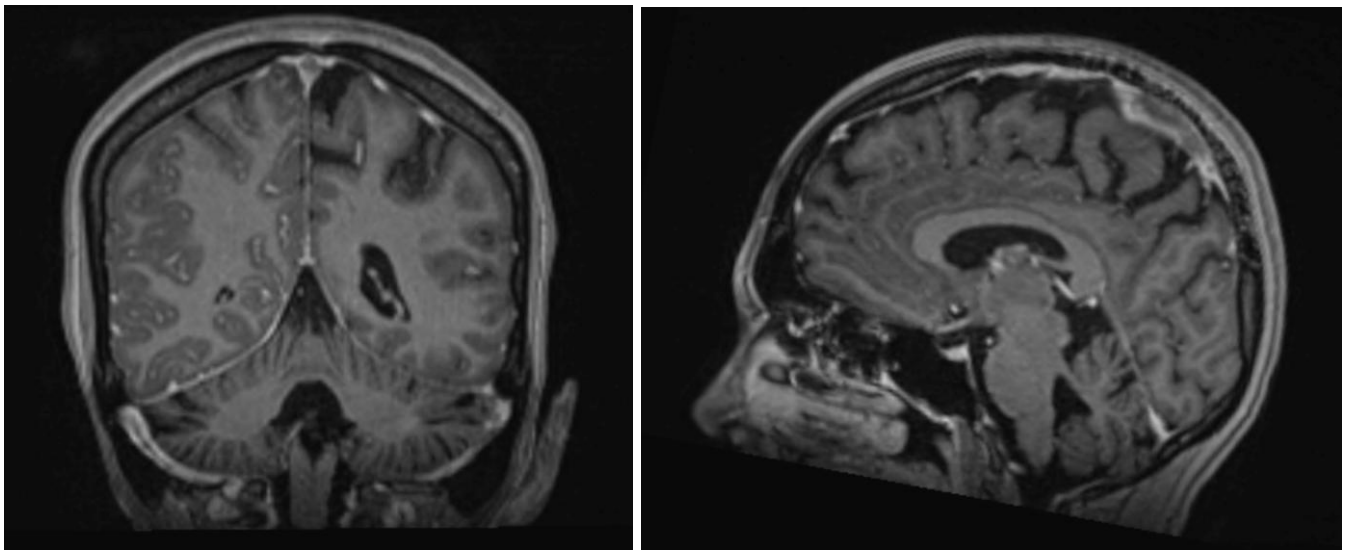

Figure 1: Contrast-enhanced T1 MPRAGE sequence MRI Brain in coronal (A) and sagittal (B) views showing filling defects in the superior sagittal sinus and right sigmoid sinus, consistent with thrombosis.

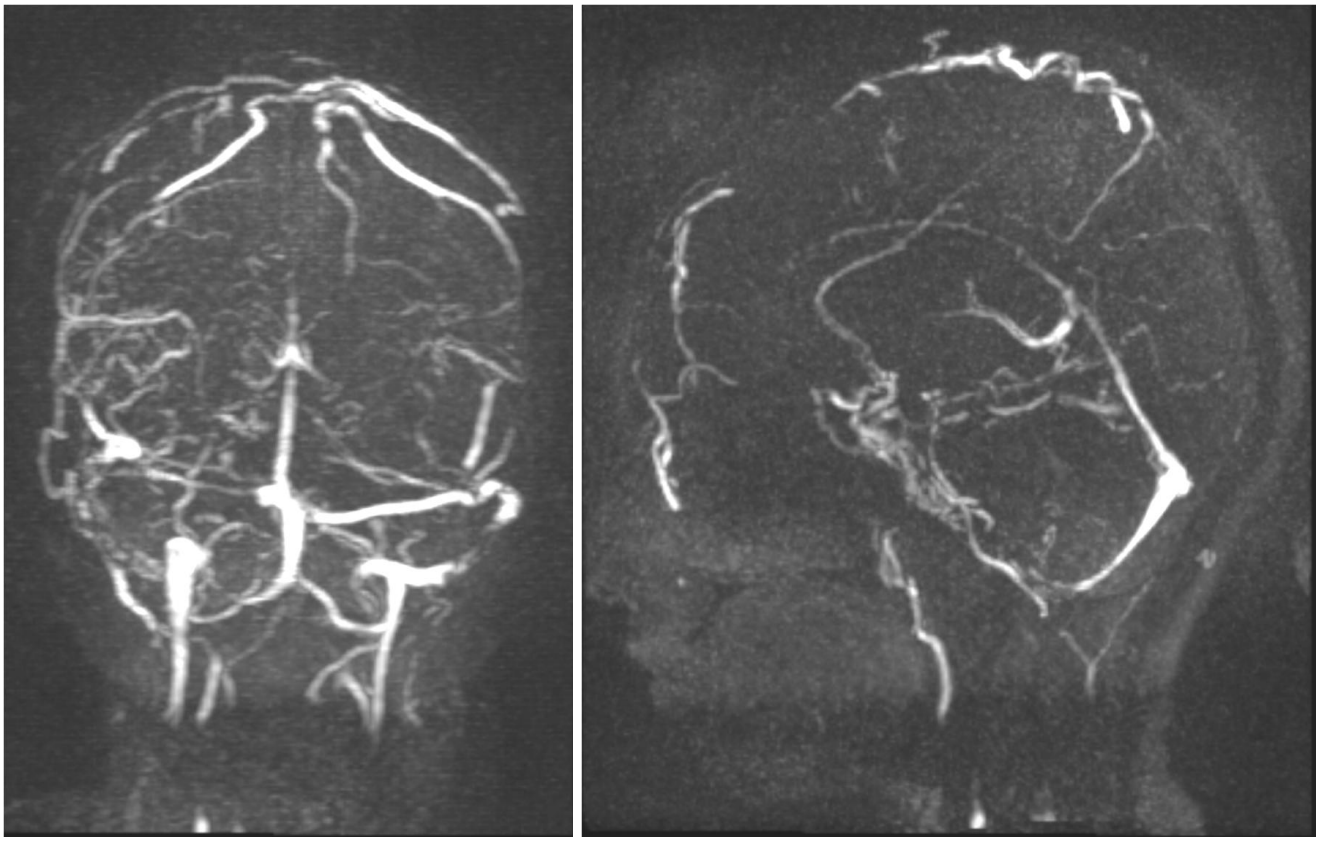

Figure 2: Magnetic Resonance Venography (MRV) sequences in coronal (A) and sagittal (B) views showing short-segment thrombosis in the left sigmoid sinus.

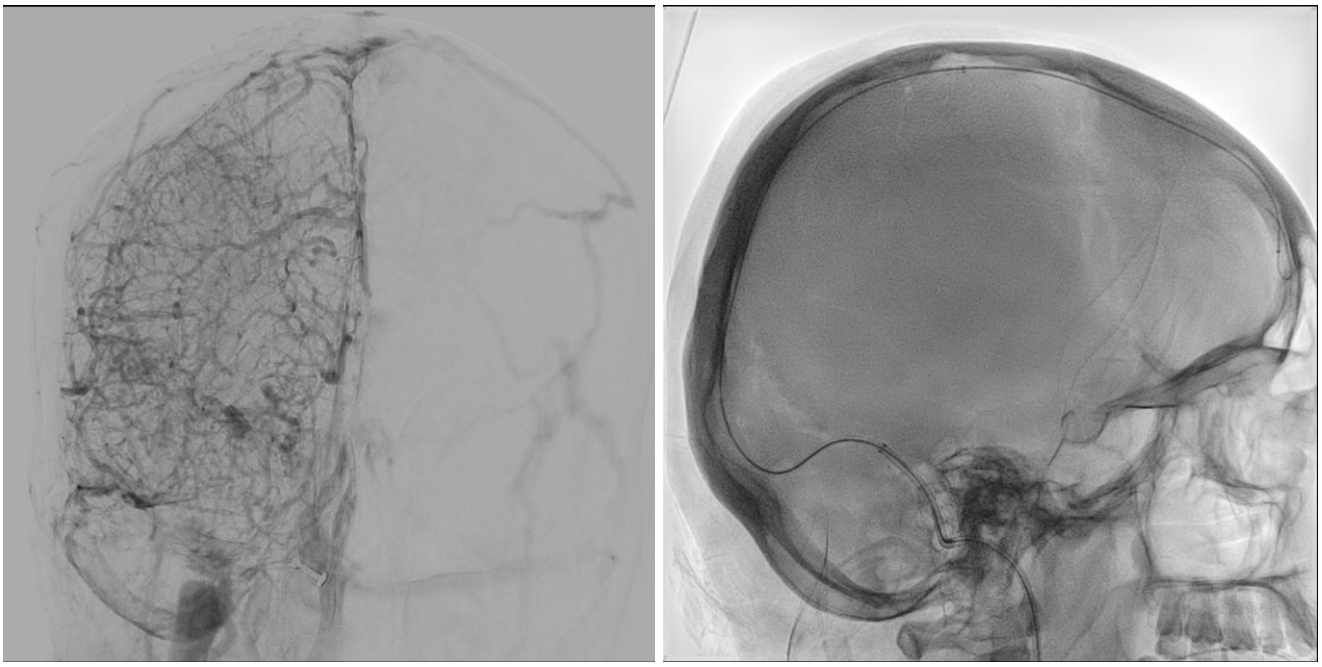

Figure 3: Cerebral DSA (A) showing non-opacification of the superior sagittal sinus and filling defect in the right sigmoid sinus with venous drainage converging into the proximal sigmoid sinus. Screening image (B) showing a suction catheter and guidewire tip in the mid and anterior segment of the superior sagittal sinus.