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No. *Title* *Page*

Case Report

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:

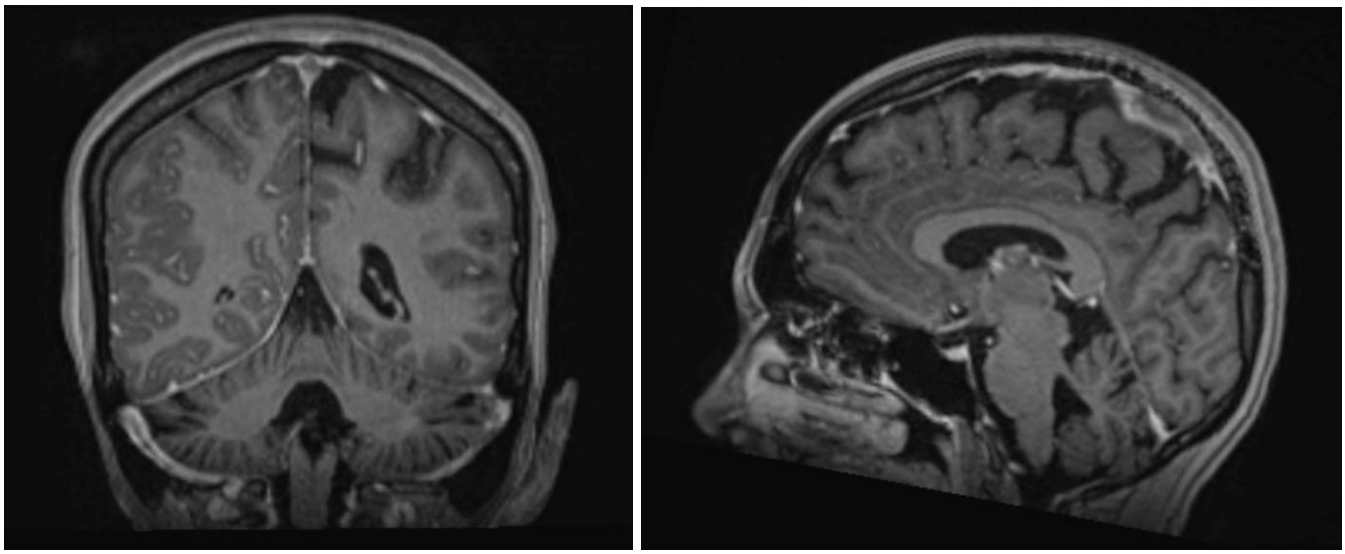

Figure 1: Contrast-enhanced T1 MPRAGE sequence MRI Brain in coronal (A) and sagittal (B) views showing filling defects in the superior sagittal sinus and right sigmoid sinus, consistent with thrombosis.

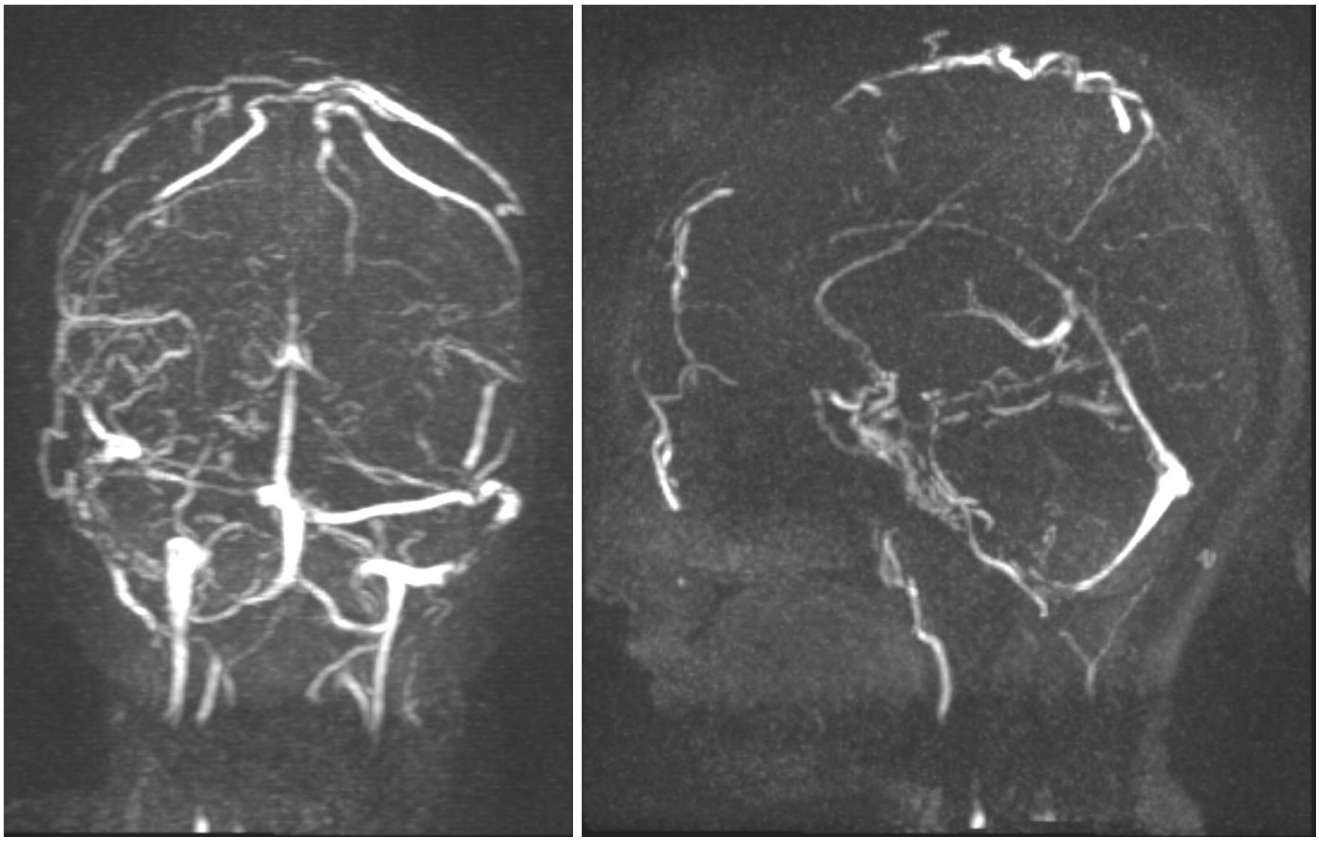

Figure 2: Magnetic Resonance Venography (MRV) sequences in coronal (A) and sagittal (B) views showing short-segment thrombosis in the left sigmoid sinus.

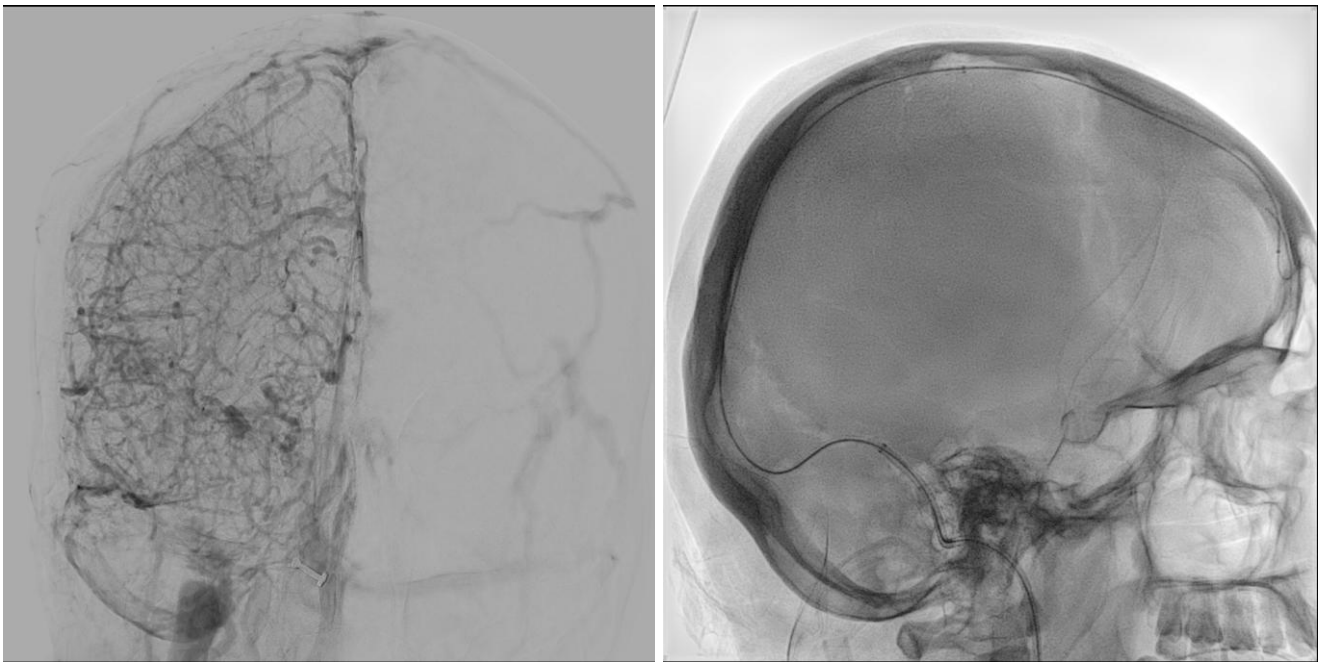

Figure 3: Cerebral DSA (A) showing non-opacification of the superior sagittal sinus and filling defect in the right sigmoid sinus with venous drainage converging into the proximal sigmoid sinus. Screening image (B) showing a suction catheter and guidewire tip in the mid and anterior segment of the superior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

SCLEROTHERAY AS MINIMALLY INVASIVE TREATMENT OPTION FOR BAKER'S CYST: A RARE CASE REPORT

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ABSTRACT:
Baker's cyst, or popliteal cyst, is a fluid-filled swelling in the popliteal fossa, commonly associated with joint disorders in adults, leading to discomfort and restricted knee movement. In children, it is less common and typically linked to juvenile idiopathic arthritis, though it can also occur idiopathically. Treatment for Baker's cyst include conservative management, surgery, and minimally invasive techniques such as aspiration and corticosteroid injections, which are often associated with recurrence (5%-70%).

Sclerotherapy has emerged as a promising minimally invasive treatment, involving the injection of a sclerosant into the cyst to induce inflammation, occlusion, and fibrosis. We present a rare case of a symptomatic Baker's cyst successfully treated with bleomycin sclerotherapy in a 5-year-old boy, diagnosed via ultrasound.

Despite limited studies, this case demonstrates positive outcomes, adding to the evidence supporting sclerotherapy as a safe and effective alternative to invasive procedures, particularly when other treatments fail or are contraindicated.

Keywords: Baker's cyst, popliteal cyst, sclerotherapy

INTRODUCTION

Baker's cysts are fluid-filled swellings arising in the popliteal fossa between the medial head of the gastrocnemius and the semimembranosus tendon via communication with the knee joint (1). It commonly occurs in adults with high incidence (94%) due to underlying knee condition such as inflammation or injury (2,3). Less commonly occur in pediatric group, and it is typically linked with juvenile idiopathic arthritis but can also be idiopathic (4). Symptoms can include discomfort, knee pain, swelling, and restricted movement in the affected knee (5). Minimally invasive method of treatment is preferred compared to surgical method in the current evolving the healthcare landscape (1). Standard minimally invasive treatments such as aspiration and corticosteroid injections, aim to reduce inflammation and fluid accumulation, but there is a chance of recurrence (3). The long term outcome of corticosteroid treatment is not known (6). Sclerotherapy offers an alternative treatment method to the existing armamentarium of conservative treatments and surgical options, offering potential benefits such as reduced recovery time and minimal scarring (7). In contrast, surgical treatment requires more time for wound healing, which may prolong hospitalization.

Sclerotherapy is the targeted injection of a chemical irritant/sclerosant into the targeted lesion to produce inflammation, occlusion, and eventual fibrosis. It is an established treatment for venous malformations especially on head and neck. Comparing with pre-existing literature review, there is limited literature regarding sclerotherapy treatment of Baker's cyst, thus limited sample size obtained. This report discusses a case where sclerotherapy was employed to treat a Baker's cyst successfully.

CASE REPORT

We report a 5-year-old boy with no known medical illness who presented with painless swelling over the back of left knee for the past 6 months. The swelling did not increase in size. There was no history of fall or trauma. Physical examination revealed a palpable mass in the popliteal fossa. Ultrasound examination showed a cystic lesion within the left popliteal fossa suggestive of Baker's cyst (Figure 1).

No periosteal reaction or lytic changes on the left knee radiograph (Figure 2).

The guardian of the patient consented to undergo sclerotherapy. The procedure was done under local anesthesia, with infiltration at the left posterior knee region. Under ultrasound guidance, 20 mL of clear, thick, gel-like fluid was aspirated from the cyst. Subsequently, 3 mL of bleomycin (4.5 mg) was injected into the cyst cavity as a sclerosing agent. Ultrasound guidance was maintained throughout the procedure to ensure precise placement and prevent leakage of bleomycin outside the cyst. No compression was applied post procedure. The procedure was uneventful with no immediate complication. The patient was observed for a few hours and discharged on the same day. No post-injection complications, such as fever, intolerable pain, or transient hyperpigmentation, were observed in this case.

Ultrasound follow-up at 11 months post-procedure showed significantly smaller cystic lesion in the left popliteal fossa between the left semimembranosus and medial head of gastrocnemius muscles, associated with a thickened sac wall (Figure 3).

RESULTS AND DISCUSSION

Sclerotherapy treatment is a safe and effective alternative to corticosteroid injection and surgery for the treatment of Baker's cyst, particularly for paediatric patients and patients with comorbid conditions that may increase surgical risk as well as when conservative measures fail. Although corticosteroid injection is effective in reducing inflammation, it may lead to deterioration of cartilage in the joint (8). Conversely, experimental studies on intra-articular sclerotherapy have shown no significant impact on the joint cavity or ligaments (9).

Sclerotherapy is a well-established treatment for venous malformations, particularly in the head and neck region. A systematic review and meta-analysis evaluating various sclerosing agents

found that bleomycin, a mild sclerosing agent, demonstrated a superior safety profile compared to sodium tetradecyl sulfate (STS). Additionally, it resulted in higher patient satisfaction (10).

Another literature review documented a study in which a ganglion cyst was successfully treated with bleomycin, reducing the need for invasive surgery (11).

A few studies have reported using ethanol (12) and hypertonic dextrose solution (13) as sclerosing agents for Baker's cyst treatment, showing favorable outcomes. However, none have documented the use of lmycin. Given its superior safety profile and availability at our center, we opted to use bleomycin for treating the Baker's cyst in a 5-year-old boy. Ultrasound guidance played a crucial role in ensuring optimal cyst aspiration and precise sclerosant delivery, minimizing complications. The positive outcome of this case, along with others, reinforces sclerotherapy as a primary treatment option for symptomatic Baker's cysts and contributes to the growing evidence supporting its effectiveness and safety profile.

CONCLUSION

This case report highlights the potential of sclerotherapy as a safe and effective treatment for Baker's cysts, offering symptomatic relief and cyst size reduction. Therefore, it can be considered a first-line treatment, providing a viable alternative to surgery.

CONFLICTS OF INTEREST

The authors have declared no conflicts of interest.

FUNDING

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FIGURE LEGENDS:

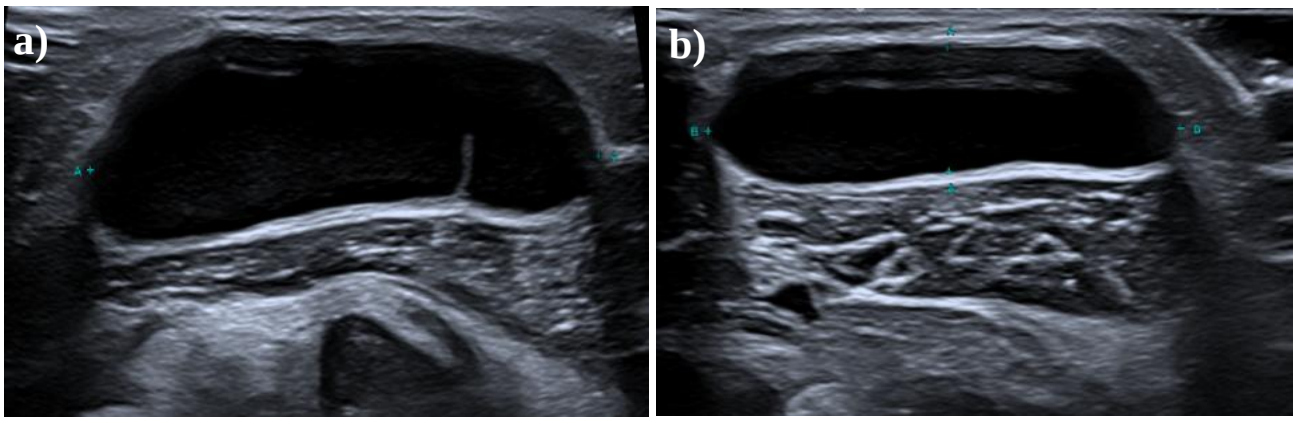

Figure 1: Axial (a) and sagittal (b) ultrasound images of pre-treatment of the Baker's cyst within the left popliteal fossa of the 11-month interval.

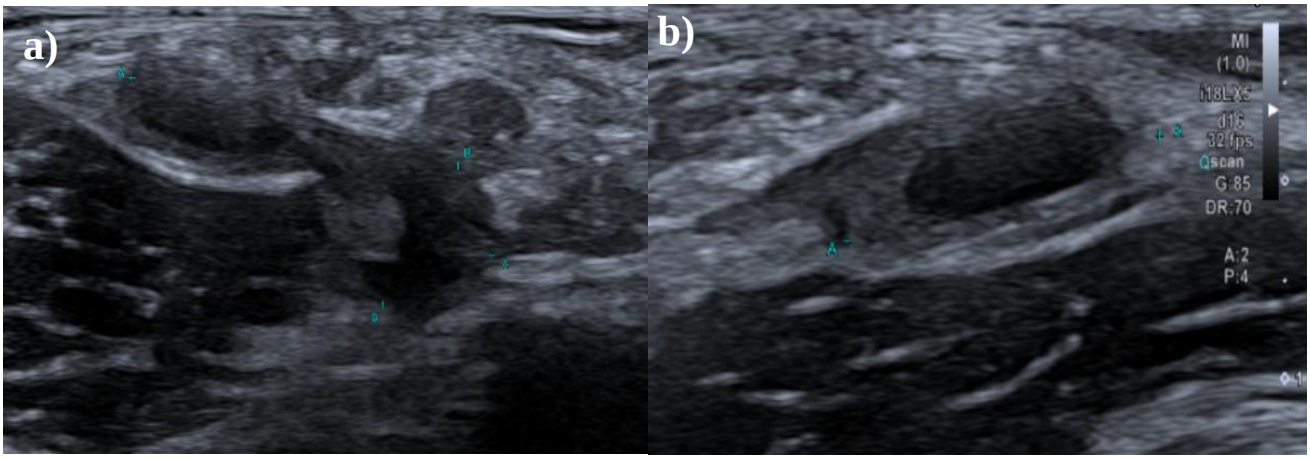

Figure 2: Axial (a) and sagittal (b) ultrasound images of post-treatment of the Baker's cyst within the left popliteal fossa of the 11-month interval. The rest significant reduction in size of the cyst from 1.0cm x 4.0cm x 4.6cm to 0.9 x 1.6 x 1.0 cm, associated with a thickened wall.

Figure 3: Left knee radiograph (AP and lateral view) showed soft tissue swelling at the popliteal fossa of left knee. No calcification or gas lucency within. The bony structure and joint space are intact.