

Hip Joint Denervation Using Radiofrequency Ablation for Chronic Hip Pain in a Young Female with Autoimmune Hemolytic Anemia: A Case Report

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Abstract: Chronic hip pain in patients with autoimmune hemolytic anemia (AIHA) is commonly attributed to avascular necrosis (AVN) secondary to prolonged steroid therapy and vascular compromise. However, bone marrow oedema and micro fractures without radiological evidence of AVN may also contribute to severe pain. We report a case of a 16-year-old female with AIHA presenting with persistent unilateral hip pain refractory to pharmacological management. Magnetic resonance imaging (MRI) revealed bone marrow oedema with micro fractures of the femoral head but no signs of AVN. The patient underwent fluoroscopy- and ultrasound-guided radiofrequency ablation (RFA) of the articular branches of the femoral and obturator nerves for hip joint denervation. Significant symptomatic improvement was noted at four weeks' follow-up. This case highlights the role of minimally invasive interventional pain procedures in managing refractory hip pain in young patients with hematological disorders.

Keywords: Hip joint denervation, Radiofrequency ablation, Autoimmune hemolytic anemia, Bone marrow oedema, Chronic hip pain

1. Introduction

Autoimmune hemolytic anemia (AIHA) is characterized by immune-mediated destruction of red blood cells and often requires prolonged corticosteroid and immunosuppressive therapy. Long-term steroid exposure and disease-related vascular compromise predispose patients to musculoskeletal complications, particularly avascular necrosis (AVN) of the femoral head.

However, not all hip pain in such patients is attributable to AVN. Bone marrow oedema syndrome and subchondral micro fractures may occur independently and can cause significant morbidity. Conservative management includes analgesics, neuropathic medications, activity modification, and physiotherapy. When pharmacologic therapy fails, interventional procedures such as hip joint denervation may be considered.

Radiofrequency ablation (RFA) targeting the articular branches of the femoral and obturator nerves has emerged as an effective minimally invasive option for chronic hip pain.

2. Case Presentation

A 16-year-old female presented with severe right hip pain for four months. The pain was insidious in onset, progressive, deep-seated in the groin region, and exacerbated by weight-bearing and hip movements. There was no history of trauma.

She was a known case of autoimmune hemolytic anemia and had experienced three disease relapses. She was on azathioprine (Azoran) and systemic corticosteroids at the time of presentation.

Pain severity was rated 8/10 on the Numerical Rating Scale (NRS). The pain was poorly responsive to:

- NSAIDs
- Gabapentinoids
- Tricyclic antidepressants
- Activity modification

Functional Metrics

- Patient is complaining of pain after walking for a duration of 2 to 3 minutes.
- Unable to sit cross legged on floor due to pain.
- Moderate to severe pain on hip flexion and internal rotation.

Examination

- Antalgic gait
- Painful restriction of hip flexion and internal rotation
- No limb length discrepancy
- No neurovascular deficit

Imaging

MRI of the hip revealed:

- Bone marrow oedema involving the femoral head
- Subchondral micro fractures
- No radiological evidence of avascular necrosis (no crescent sign, no subchondral collapse, preserved femoral head contour)

The absence of AVN was significant given the known association between steroid therapy and femoral head osteonecrosis in AIHA patients. Other possible causes like Osteoarthritis Hip, Lumbar radiculopathy and Greater Trochanteric Pain Syndrome (GTPS) were ruled out with thorough clinical examination and imaging.

Intervention

After multidisciplinary discussion and failure of conservative therapy, hip joint denervation was planned.

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Diagnostic Block

A diagnostic block targeting the articular branches of the femoral and obturator nerves was performed under fluoroscopic and ultrasound guidance. The patient reported more than 70% temporary pain relief, confirming articular origin of pain.

Radiofrequency Ablation Procedure

Under strict aseptic precautions:

- a) Combined fluoroscopic and ultrasound guidance was used.
- b) Targeted nerves:
 - Articular branches of femoral nerve
 - Articular branches of obturator nerve
- c) Sensory stimulation was performed to confirm appropriate localization.
- d) Motor stimulation ensured absence of unwanted motor involvement.
- e) Conventional radiofrequency ablation was performed at 80°C for 90 seconds at each target site.

The procedure was well tolerated without complications.

Outcome

At 4-week follow-up:

- Pain reduced from NRS 8/10 to 2/10
- Patient able to walk for more than 15 minutes without significant pain
- Able to sit cross legged on floor with a very minor discomfort
- Improved weight-bearing tolerance
- Improved range of motion
- Reduced dependence on analgesics
- No procedure-related adverse effects

The patient reported significant improvement in quality of life and functional mobility.

3. Discussion

In AIHA patients, hip pain is often prematurely attributed to AVN due to steroid exposure.¹ However, bone marrow edema and micro fractures may precede structural collapse or occur independently.² In such scenarios, denervation provides symptomatic relief while underlying pathology is managed conservatively.

Hip joint innervation is primarily derived from:³

- Femoral nerve (anterior capsule)
- Obturator nerve (inferomedial capsule)
- Accessory obturator nerve (when present)

Targeted RFA of these articular branches interrupts nociceptive transmission while preserving motor function.

RFA offers advantages:^{4, 5, 6}

- Minimally invasive
- Opioid-sparing
- Preserves joint biomechanics
- Repeatable if necessary

Early interventional management may prevent chronic pain sensitization in young patients.

4. Conclusion

Hip joint denervation using fluoroscopy- and ultrasound-guided radiofrequency ablation of femoral and obturator articular branches is an effective minimally invasive option for refractory hip pain in young patients with autoimmune hemolytic anemia without radiological evidence of AVN. Early intervention may significantly improve function and quality of life.

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Fig 1: MRI Pelvis with Both Hip Joints



Fig 2A: Needle Position for Femoral Nerve RFA

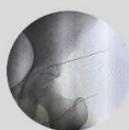


Fig 2B: Final Needle Position on Fluoroscopy for Femoral Nerve RFA



Fig 2C: Dye Spread for Femoral Nerve RFA



Fig 3A: Needle Position for Obturator Nerve RFA



Fig 2B: Final Needle Position on Fluoroscopy for Obturator Nerve RFA

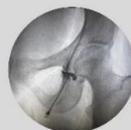


Fig 2C: Dye Spread for Obturator Nerve RFA