

Use of Thoracic Splanchnic Nerve Radiofrequency Ablation in Refractory Upper Abdominal Pain From Deep Infiltrating Endometriosis

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KEY TAKEAWAY — Right T11–T12 thoracic splanchnic nerve RFA reduced refractory upper-abdominal pain from 10/10 to 5/10 at one week in a patient with deep infiltrating endometriosis.

Introduction

- Endometriosis affects ~10% of reproductive-aged women and contributes to chronic pelvic pain, infertility, and reduced quality of life.[1]
- Deep infiltrating endometriosis (DIE) is defined by lesions extending >5 mm beneath the peritoneum and commonly involves the bowel, bladder, uterosacral ligaments, and parametrium.[2]
- DIE frequently affects autonomic and somatic pelvic nerves, including the inferior hypogastric plexus.
- This promotes central sensitization, visceral hyperalgesia, and pelvic–abdominal cross-sensitization that may persist despite excision or hormonal therapy.[3]

Case Presentation

- 38-year-old G3P2012 female, BMI 29.26 kg/m², with chronic visceral abdominal pain attributed primarily to DIE and recurrent ovarian cysts.
- History: chronic pancreatitis, chronic abdominal pain syndrome, cyclic vomiting syndrome, hidradenitis suppurativa, generalized anxiety disorder, and major depressive disorder.
- Prior hysterectomy for endometriosis-related pelvic pain, with continued severe upper abdominal and epigastric visceral pain.
- Failed multimodal medical and surgical management — neuromodulatory agents, opioids, muscle relaxants, NSAIDs/acetaminophen, and surgical intervention — none of which provided durable relief.

References

1. Zondervan KT, Becker CM, Missmer SA. Endometriosis. N Engl J Med. 2020;382:1244–1256.
2. Koninckx PR, Ussia A, Adamyan L, et al. Deep endometriosis: definition, diagnosis, and management. Fertil Steril. 2012;98(3):564–571.
3. McNamara HC, Frawley HC, Donoghue JF, et al. Peripheral, central, and cross sensitization in endometriosis-associated pain and comorbid pain syndromes. Front Reprod Health. 2021;3:729642.
4. Anaf V, Simon P, El Nakadi I, et al. Relationship between endometriotic foci and nerves in rectovaginal endometriotic nodules. Hum Reprod. 2000;15(8):1744–1750.
5. Garcea G, Thomasset S, Berry DP, Tordoff S. Percutaneous splanchnic nerve radiofrequency ablation for chronic abdominal pain. ANZ J Surg. 2005;75(8):640–644.

Methods

- Written and verbal informed consent was obtained prior to the procedure, including discussion of bleeding, infection, pneumothorax, nerve injury, neuritis, hypotension, nausea, and failure to achieve pain relief. Consent was also obtained for case report submission.
- Intervention: right thoracic splanchnic nerve radiofrequency ablation (RFA) at T11–T12.
- The C-arm was angled caudally to displace the ribs cephalad and obliqued 5° ipsilaterally to improve safety and access.
- Under fluoroscopic guidance, 10-cm RF cannulae with 10-mm active tips were advanced along the anterolateral T11–T12 vertebral bodies to the anterior third of the vertebral body, remaining medial to the pleural margin without lateral needle direction.
- Placement was confirmed on AP/lateral views with contrast injection demonstrating no lateral or vascular spread, followed by sensory and motor stimulation prior to lesioning.
- Thermal RF ablation at 80°C for 90 seconds at each level, following injection of 0.5% bupivacaine.

Fluoroscopic Imaging

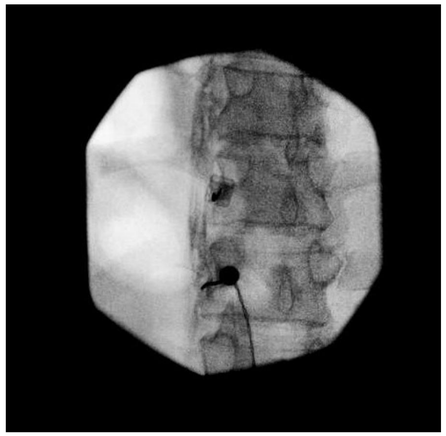


Image 1. Oblique fluoroscopic view demonstrating placement of the RF cannulae along the anterolateral aspect of the right T11–T12 vertebral bodies for thoracic splanchnic nerve radiofrequency ablation.

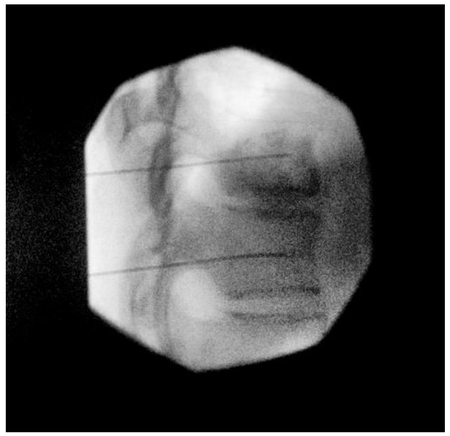


Image 2. Lateral fluoroscopic view confirming advancement of the RF cannulae to the anterior one-third of the T11–T12 vertebral bodies prior to lesioning.

Outcomes

- Immediately post-procedure the patient experienced persistent nausea despite 1 L of IV fluids; she was monitored and discharged in stable condition.
- Day 1: significant improvement in nausea and overall condition.
- Week 1: pain severity improved from 10/10 pre-procedure to 5/10, with better tolerance of daily activities and fewer severe visceral pain episodes.
- This response is consistent with prior thoracic splanchnic nerve RFA outcomes.

10/10 → 5/10
Pain severity, pre-procedure → 1 week

Discussion & Conclusion

- The thoracic splanchnic nerves transmit visceral pain signals to the celiac plexus, making them targets in interventional pain therapy for pancreatitis and upper-abdominal malignancy.[4]
- Splanchnic nerve RFA interrupts sympathetic and visceral nociceptive transmission and can produce durable relief in chronic upper-abdominal pain syndromes.[5]
- Given evidence that endometriosis pain involves cross-organ sensitization and overlapping visceral neural pathways, splanchnic nerve RFA may be a strategy for managing refractory epigastric and upper-abdominal pain in DIE.[3]

In this patient, T11–T12 thoracic splanchnic nerve RFA produced meaningful early relief of refractory upper-abdominal pain attributed to DIE, supporting further study of sympathetic neurolysis for visceral pain of gynecologic origin.

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