



RELENTLESS VISCERAL PAIN — SPLANCHNIC NERVE RADIOFREQUENCY ABLATION AS A RESCUE IN METASTATIC GALLBLADDER CARCINOMA

Anaesthesiology

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ABSTRACT

Background: Pain management in advanced abdominal malignancies becomes challenging when both pharmacological therapy and conventional interventional techniques fail. The Celiac Plexus Block is widely used for upper abdominal cancer pain; however, its effectiveness may be limited in cases of distorted anatomy or advanced disease¹. Radiofrequency Ablation of the splanchnic nerves offers a precise and controlled alternative. **Case Presentation:** We report a 50-year-old male with carcinoma gallbladder with retroperitoneal and pulmonary metastases, presenting with severe diffuse abdominal pain with a Visual Analog Scale (VAS) score of 8–9/10, refractory to oral morphine and transdermal buprenorphine patch. A diagnostic celiac plexus block followed by alcohol neurolysis under ultrasound guidance failed to provide adequate pain relief. Given persistent symptoms, bilateral splanchnic nerve radiofrequency ablation was performed under fluoroscopic guidance using both pulsed and conventional thermal techniques. **Conclusion:** This case highlights the role of splanchnic nerve radiofrequency ablation as an effective rescue technique in refractory cancer pain, particularly when both celiac plexus block and neurolysis fail.

KEYWORDS

Gallbladder carcinoma, Splanchnic nerve, Radiofrequency ablation, Cancer pain, Celiac plexus block, Neurolysis

INTRODUCTION:

Pain associated with advanced gallbladder carcinoma is often severe, multifactorial, and difficult to manage². Patients frequently require escalating doses of opioids, which may lead to significant side effects without adequate pain control.

The Celiac Plexus Block is considered the standard interventional technique for managing upper abdominal malignancy-related pain³. However, its success depends on the adequate spread of local anaesthetic or neurolytic agents, which may be compromised in cases of tumour infiltration, fibrosis, or distorted anatomy.

The splanchnic nerves represent a more proximal target in the visceral pain pathway, transmitting afferent fibres to the celiac plexus. Radiofrequency Ablation of these nerves provides a controlled method of interrupting nociceptive transmission and may offer advantages over chemical neurolysis⁴.

Although commonly described in pancreatic malignancies, its role in gallbladder carcinoma remains underreported. We present a case demonstrating the successful use of this technique after failure of both celiac plexus block and alcohol neurolysis.

Case Report:

A 50-year-old male presented with severe diffuse abdominal pain. He was a known case of carcinoma gallbladder diagnosed three years prior, with documented retroperitoneal and pulmonary metastases. The patient had undergone 10 cycles of chemotherapy and 20 cycles of radiotherapy.

Despite being on oral morphine and transdermal buprenorphine patch, the patient continued to experience persistent severe pain with a Visual Analog Scale (VAS) score of 8–9/10, requiring frequent rescue analgesics.

A diagnostic celiac plexus block was performed one week prior; however, it failed to provide significant relief. Subsequently, alcohol neurolysis of the celiac plexus was performed under ultrasound guidance, but the patient continued to experience severe pain.

On examination, diffuse abdominal tenderness was present. PET-CT imaging revealed a primary gallbladder tumor with aortocaval lymph node involvement and a cavitating nodule in the posterior segment of the right lower lobe of the lung, suggestive of pulmonary metastasis. Given the failure of both diagnostic and neurolytic celiac plexus interventions, a decision was made to proceed with bilateral splanchnic nerve radiofrequency ablation.

Procedure:

The patient was positioned prone and standard monitoring was instituted. Under strict aseptic precautions and fluoroscopic (C-arm) guidance, bilateral splanchnic nerve access was obtained.

Radiofrequency ablation was performed using 20-gauge, 100 cm straight needles with a 10 mm active tip.

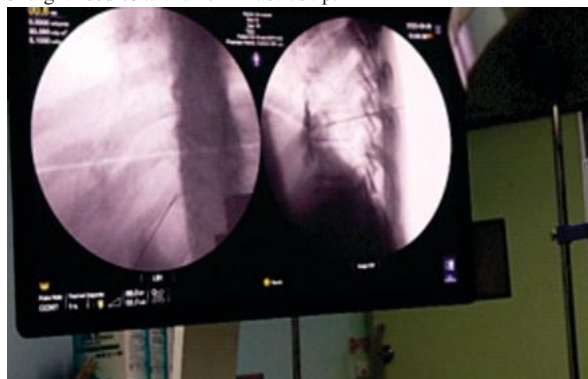


Figure 1: C-arm guided fluoroscopic image showing appropriate dye spread confirming correct needle placement for splanchnic nerve ablation

A dual lesioning technique was used:

- Pulsed radiofrequency at 42°C for 120 milliseconds
- Conventional thermal radiofrequency at 80°C for 75 milliseconds

The procedure was completed without complications.

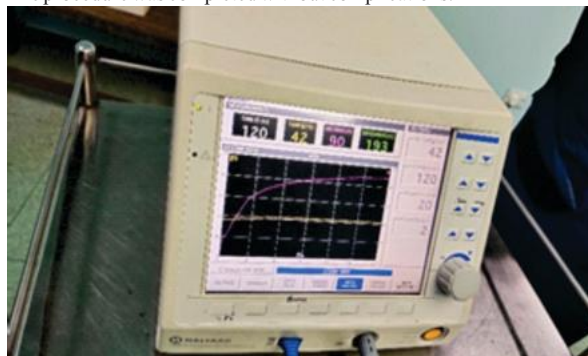


Figure 2: Radiofrequency generator screen demonstrating pulsed waveform with temperature maintained at 42°C and real-time lesioning graph during splanchnic nerve ablation.

Outcome:

Following the procedure, the patient reported a significant reduction in pain intensity. The Visual Analog Scale (VAS) score decreased from 8–9/10 pre-procedure to 2–3/10 post-procedure. There was marked improvement in overall comfort and a significant reduction in the requirement for rescue analgesics. No immediate complications were observed.

DISCUSSION:

Pain in gallbladder carcinoma is complex and often includes visceral, somatic, and neuropathic components². Although the celiac plexus is the standard target for intervention, its effectiveness may be limited in advanced malignancies.

In the present case, both diagnostic celiac plexus block and subsequent alcohol neurolysis failed to provide adequate pain relief. This may be attributed to tumour-related distortion of the celiac plexus, fibrosis resulting from prior chemotherapy and radiotherapy, and inadequate spread of the neurolytic agent³. Alcohol neurolysis depends on uniform diffusion for effective denervation, which may be compromised in such conditions.

The splanchnic nerves, located along the thoracic vertebral bodies, provide a more proximal and anatomically preserved target in the pain pathway. Targeting these nerves avoids the limitations associated with plexus-level interventions.

Unlike chemical neurolysis, Radiofrequency Ablation provides controlled and localized lesioning independent of tissue spread, reducing the risk of incomplete blockade⁴. The combined use of pulsed and thermal radiofrequency in this case may have contributed to both neuromodulation and neurodestruction, thereby enhancing analgesic efficacy.

The significant reduction in VAS score observed in our patient further supports the effectiveness of this technique in refractory visceral cancer pain.

Although there is substantial literature supporting splanchnic nerve interventions in pancreatic cancer, reports in gallbladder carcinoma remain limited⁶. This may be due to late presentation, rapid disease progression, and underutilization of interventional pain techniques. This case demonstrates that failure of celiac plexus neurolysis does not preclude successful pain management with splanchnic nerve ablation and highlights its role as an effective rescue modality.

CONCLUSION:

Splanchnic nerve radiofrequency ablation is a safe and effective rescue technique for managing refractory abdominal pain in advanced gallbladder carcinoma, particularly when both celiac plexus block and neurolysis fail.

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