RESEARCH PAPER

Fluoroscopy-Guided Celiac Plexus Neurolysis for Pain Management in Gallbladder Malignancies with Peritoneal Metastases: A Case Report and Literature Review

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Received: 17th Mar, 2026 | Revised: 29th Mar, 2026 | Accepted: 19th Apr, 2026 | Available Online: 5th May, 2026

ABSTRACT

Background: Pain associated with abdominal malignancies or metastases can be very severe and can be intractable and resistant to conventional pharmacologic therapies. Typically, narcotics and non-narcotics are used in combination to alleviate the cancer pain, but these are often unsuccessful. Neurolysis of the celiac plexus is being used with success for management of the upper abdominal pain associated with abdominal malignancies with added advantages of improving quality of life, pain relief and decreasing narcotic consumption.

Case Presentation: We report a 52-year-old male with a gallbladder malignancies with peritoneal metastases presenting with severe upper abdominal pain unresponsive to high-dose opioids. Fluoroscopy-guided bilateral celiac plexus neurolysis using ethanol was performed. Post-procedure, pain scores decreased from NRS 9-10 to NRS 4-5, with additional therapy on PCA sulfentanyl continuous dose 2 mcg/hour, demand dose 4 mcg, interval lock 10 minutes. The patient was discharged in stable condition one day later and then the patient was control at the anesthesia polyclinic with the pain scale dropping to 2-3 with fentanyl patch, and patient feels sleep quality improved.

Discussion: CPN is a safe and effective intervention for upper abdominal cancer pain but there was pain from peritoneal region still requires other analgesic. Literature supports its opioid-sparing benefits, long-term efficacy, and favorable safety profile when performed under image guidance. Early intervention may optimize outcomes and reduce opioid-related side effects.

Conclusion: CPN should be considered early in the multimodal management of refractory abdominal pain in a gallbladder malignancies with peritoneal metastases.

Keywords: Celiac Plexus Block, Celiac Plexus Neurolysis, Gallbladder Malignancies, Pain Management, Interventional Analgesia

How to cite this article: Syaifudin W, Susila D., Fluoroscopy-Guided Celiac Plexus Neurolysis for Pain Management in Gallbladder Malignancies with Peritoneal Metastases: A Case Report and Literature Review. Int J Drug Deliv Technol. 2026;16(42s): 1147-1150; DOI: 10.25258/ijddt.16.42s.122

Introduction

Cancer-associated pain is a debilitating multidimensional experience with high prevalence, affecting up to 75% of patients with advanced disease [1]. While the WHO analgesic ladder is the standard for management, pain from abdominal malignancies often proves intractable to pharmacological therapy or is limited by adverse effects [2]. In such cases, interventional therapies like neurolysis of the celiac plexus. In 1914, the technique of blocking the celiac plexus using percutaneous injection was introduced by Max Kappin. Neurolysis in this block was first described by Robert R. Jones in 1957. The role of neurolysis in pain management from gastrointestinal malignancies was first described by Bridenbaugh [3]. Neurolysis of the celiac plexus is used for abdominal pain relief in abdominal malignancies. Although tumor-induced anatomical distortion can technically complicate the procedure, celiac plexus neurolysis significantly improves quality of life, provides superior pain relief, and reduces narcotic consumption compared to conventional medical management [3]. However, The procedure can

sometimes be difficult to execute or rendered ineffective due to the altered anatomy of the celiac plexus caused by the tumor mass itself.

Case Presentation

A 52-year-old male with gallbladder malignancies with peritoneal metastases was admitted with persistent right upper abdominal-epigastric pain radiating to the lower abdomen for the past 1 month, worsening over the last week and abdomen slight distended. Pain intensity ranged from NRS 9–10, gets worse with mobilitation, the consequences were disrupting sleep and daily activities. He also reported nausea, sometimes vomiting with jaundice appearance in the last 1 week.

Past Medical History: There was no medical history recorded

Physical Examination: The patient with epigastric-upper right abdomen tenderness; Height 160, Weight 60 kg, BMI 23,44 vital signs were stable (RR 20/min, SpO_2 99% on room air, HR 98 bpm, BP 135/73 mmHg, Temp 36.6°C).

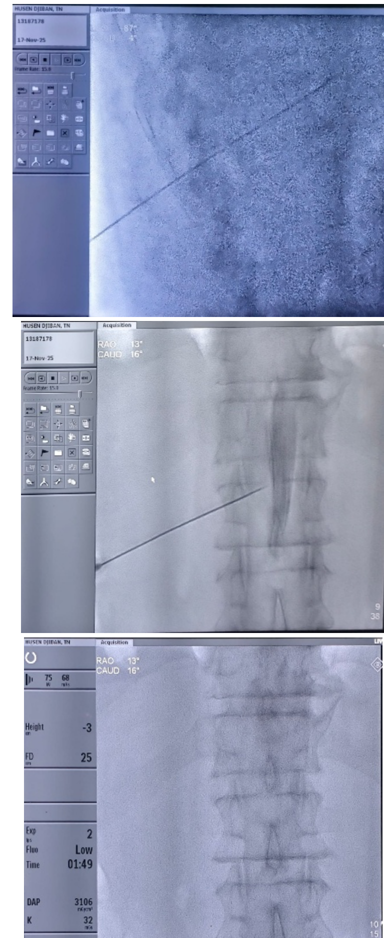
Investigations:

- **Laboratory:** Hb 11.8 g/dL, WBC 6,150/µL, Platelets 324.000/µL, SGOT 83 U/L, SGPT 106 U/L, Albumin 4.0 g/L, Bilirubin total 3.6 mg/dL, Direct 2.97 mg/dL, Random glucose 110 mg/dL, BUN 19.0, Creatine 0.75, Potassium (K) 4.10, Sodium(Na) 137, Chloride (CI) 102, APTT 28.50, PPT 14.5, HBsAg non reactive
- **Tumor markers:** CEA 1.94 ng/mL, CA 19-9 44.22 U/mL.
- **Imaging:** MRI Abdomen revealed an enhancing solid mass measuring approximately 4.2 x 4.0 x 3.2 cm in the gallbladder fossa may represent a lesion-like mass. The presence of multiple enhancing nodules in the right lobe of the liver could indicate metastasis, Fluid intensity was visible in the abdominal cavity to the pelvic cavity, signs of ascites.
- **Preoperative Assessment:** ASA II with comorbidities including malignancies and impaired liver function.

Analgesic History: History of treatment with tramadol 100 mg/8 hour,metamizole 1 gram/4 hour and the newest treatment with PCA Sulfentanyl continuous dose 4 mcg/hour, demand dose 4 mcg, interval lock 10 minutes, Amitriptyline 12.5 mg/12 hour still provided insufficient pain relief.

Procedure:

The patient is typically placed in a prone position and monitored, a 22G 15-cm needle was inserted 7 cm lateral to L1. Using a fluoroscopy-guided transaortic approach, the needle was advanced to the anterior vertebral body. Following contrast confirmation of correct placement, 5 mL of lidocaine 2% and 15 mL of alcohol 96% were administered.[4].



Outcome: Post-procedure, the patient experienced significant pain relief (NRS reduced to 4-5), with additional therapy on PCA sulfentanyl continuous dose 2 mcg/hour, demand dose 4 mcg, interval lock 10 minutes. The patient was discharged in stable condition one day later and then the patient was control at the anesthesia polyclinic with the pain scale dropping to 2-3 with durogesic patch

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Discussion

Caeliac Plexus Neurolisis in Gallblader Malignancy

Right upper quadrant pain affects over 50% of patients with advanced Gallbladder Cancer (GBC) due to distension or invasion [5]. While the standard analgesic ladder is utilized, opioid therapy is often limited by significant side effects, tolerance, and

dependence [6]. In such cases, Fluoroscopy-guided Celiac Plexus Neurolysis (CPN) serves as a vital interventional alternative. This procedure targets the celiac plexus the primary source of upper abdominal innervation—by injecting a neurolytic agent, typically 50-100% alcohol, after local anesthesia. The alcohol induces protein denaturation and Wallerian degeneration, effectively interrupting nociceptive transmission and providing relief for intractable pain [7]

Efficacy of CPN

Celiac Plexus Neurolysis (CPN) is an essential treatment for chronic abdominal pain, especially for malignant and non-malignant tumors of the abdominal organs, such as gallbladder cancer. CPN works by specifically targeting the afferent nociceptive fibers in the celiac plexus, providing significant pain reduction and improving the quality of life for patients experiencing pain that is otherwise difficult to control. In advanced abdominal cancers, this procedure notably lowers both pain levels and the need for opioid medication, thereby decreasing the associated side effects [8].

Technique and Imaging Guidance

To ensure accurate identification of the target area and adjacent structures, Celiac Plexus Neurolysis (CPN) requires some form of imaging guidance. A variety of approaches are used, including the posterior para-aortic, anterior, transaortic, trans-intervertebral disc, and endoscopic ultrasound-guided (EUS-guided) techniques [9]. While fluoroscopy remains a common and widely accessible method [9].

Complications

Common side effects of CPN include orthostatic hypotension and diarrhea, the latter resulting from sympathetic denervation and unopposed parasympathetic activity [10]. Procedural risks involve accidental intravascular or neuraxial injection, local anesthetic toxicity and trauma to adjacent structures. These injuries may lead to severe complications, including retroperitoneal hematoma, pneumothorax, infection, or paraplegia [10].

Clinical Significance and Relevance of the Present Case

Our patient had refractory pain and significant pain despite high-dose opioids, making him an ideal candidate for CPN. The procedure resulted in immediate and sustained analgesia, reduction of opioid dependence, and improvement in quality of life, consistent with published literature.

Conclusion

Severe abdominal cancer pain is associated with high morbidity and often proves refractory to standard pharmacotherapy. Celiac plexus neurolysis offers a vital minimally invasive alternative, particularly for advanced gallbladder malignancies. By using alcohol to induce inflammation and subsequent nerve necrosis, this technique achieves sympathetic denervation that effectively reduces pain severity and narcotic dependence, while significantly improving the patient's quality of life.

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