



Diagnostic celiac plexus block and outcome with neurolysis

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block

Pain is one of the most troubling symptoms for many of the over 10 million cancer patients in America. For many patients, traditional medications and treatments are not effective and they are severely debilitated by their pain, causing needless suffering at the end of life. Pancreatic cancer in particular is associated with severe, unrelenting pain that may not be responsive to opioids and other medication therapies. Celiac plexus neurolysis is a procedure with demonstrated efficacy for patients with visceral pain arising from an upper abdominal malignancy. Although a variety of techniques exist, efficacy is generally achieved in 70-90% of patients regardless of technique. Most providers will perform a diagnostic block of the celiac plexus to ensure benefit before proceeding to the neurolytic block; however, others advocate proceeding directly to the neurolytic block. In this article, we review the techniques for chemical neurolysis of the celiac plexus, discuss the literature supporting the different approaches, and discuss factors that may influence the decision to proceed with diagnostic block prior to the neurolytic procedure.

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The celiac plexus block is a technique described initially by Kappis¹ almost 100 years ago. It consists of blocking the sympathetic nerve fibers that pass through the celiac plexus and innervate the abdominal viscera. Now widely used to treat visceral pain in patients with intra-abdominal malignancies, it is most effective when used to treat pain that arises from abdominal organs that include the pancreas, liver, gallbladder, and digestive tract. Much less frequently it is used to treat chronic nonmalignant pain such as pancreatitis. Numerous techniques and radiologic modalities are now used to access the celiac plexus and perform the block. While celiac plexus nerve block typically consists of a diagnostic block with local anesthetic prior to neurolysis, some advocate directly proceeding to neurolytic celiac plexus block (NCPB).

Indications/patient selection

The primary indication for blocking the celiac plexus, or the nerves supplying the celiac plexus (splanchnic nerves), is to alleviate pain from the abdomen. Neurolysis is typically reserved for malignancies of the upper abdominal viscera (primarily pancreatic cancer), often for patients whose pain that is poorly controlled by opioid analgesics. Some advocate early intervention for those with aggressive disease before their pain becomes uncontrolled. Celiac plexus neurolysis can provide excellent pain relief and reduce the need for additional analgesics. Meta-analysis in 1995 by Eisenberg et al² showed long-lasting benefit for 70-90% of patients with intra-abdominal malignancy. Subsequent studies show similar benefit.³⁻⁷

Anatomy

There are 3 great plexuses of the chest and abdomen. These contain visceral afferent and efferent fibers as well as some parasympathetic fibers. The cardiac plexus innervates the

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thoracic structures. The celiac plexus provides innervation to most of the gut and is the largest of the 3 great plexuses. The hypogastric plexus supplies the pelvic organs.

The celiac plexus is located in the retroperitoneal space at the level of the T12 and L1 vertebrae. It lies in close proximity to numerous vascular structures including the celiac artery (plexus is anterolateral), the inferior vena cava (plexus is anterolateral on the right), and the aorta (plexus is anterior and midline).

The celiac plexus receives its primary innervation from the greater (T5-T9), lesser (T10-T11), and least splanchnic nerves (T12). These nerves, preganglionic in nature, traverse the posterior mediastinum and enter the abdomen through the crura of the diaphragm above L1. The plexus innervates most of the abdominal viscera, including the stomach, liver, biliary tract, pancreas, spleen, kidneys, adrenals, omentum, small bowel, and large bowel, to the level of the splenic flexure.

Approach

Although some may advocate 1 approach (transcrural vs retrocrural celiac plexus blockade) over the other, there is no evidence that either results in superior clinical outcomes. Decisions on which approach to take should be based on the patient's anatomical variations based on tumor burden and cancer treatments or surgeries and also the experience of the physician performing the procedure.

There are at least 2 different areas to target for the block. The first involves targeting the deep splanchnic nerves via a retrocrural approach (Fig 1). Traditionally, this involves a bilateral posterior approach, although a single-needle transdiscal approach has also been described.⁵ The second involves placing the needle anterior to the aorta in the vicinity of the celiac plexus itself. This has typically involved a posterior approach, placing the needle through 1 crus of the diaphragm, but the plexus can also be approached anteriorly under computed tomography (CT) or ultrasound guidance and may be targeted via an endoscopic, transgastric approach as well. Although landmark-based techniques have been described and operated with good success rates, most of these blocks are now performed under imaging guidance (fluoroscopy, CT, or ultrasound) as described below.⁸⁻¹⁰

For the posterior approaches described below (retrocrural or transcrural), the patient is placed prone with head turned to 1 side and pillows placed under the abdomen to reduce the lumbar lordosis. For both approaches, the fluoroscopic beam is rotated 20-30 degrees ipsilateral oblique, until the tip of the transverse process overlies the anterolateral margin of the vertebral body.

Celiac plexus block: transcrural (anterocrural) technique

The procedure is typically performed on the left due to positioning of the aorta. Skin and subcutaneous tissues over

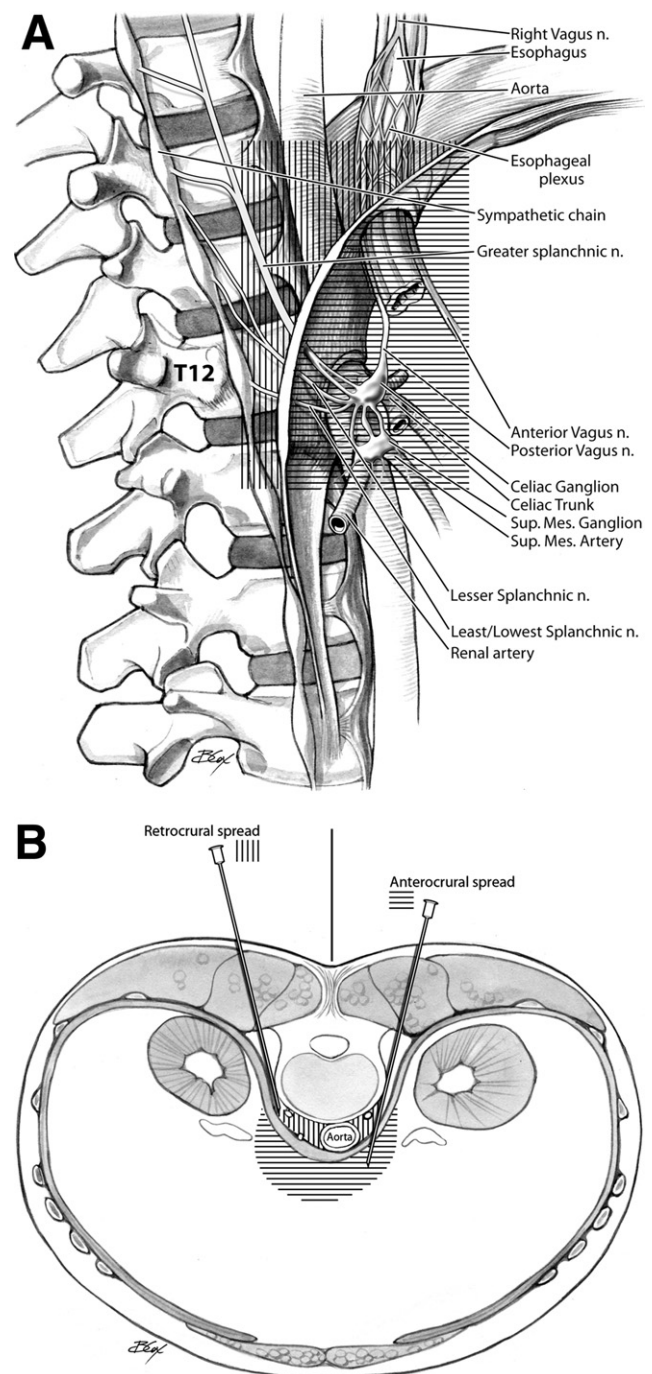


Fig 1 Celiac plexus block—(A) parasagittal and (B) cross-sectional anatomy demonstrating placement for retrocrural and anterocrural block techniques (adapted from Brown⁹).

the superior margin of the L1 vertebral body are anesthetized. A 22-gauge, 5-inch spinal needle (or 8-inch for obese patients) is advanced toward a target just caudal to the margin of the 12th rib and cephalad to the transverse process of L1 with a coaxial technique under intermittent fluoroscopic guidance (every 1-2 cm). Once the periosteum is contacted at the anterolateral margin of L1, the c-arm is rotated to a lateral projection and the needle is advanced to lie 2-3 cm anterior to the anterior margin of L1 in the lateral

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