

INTERVENTIONAL PAIN MANAGEMENT

THE ESSENTIALS OF INTERVENTIONAL PAIN MANAGEMENT PROCEDURES

Brought to you by:

Procedural Education Committee of the Interventional Pain Service Line- Resident and Fellow Section, Society of Interventional Radiology

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PERCUTANEOUS CELIAC PLEXUS NEUROLYSIS FOR PAIN PALLIATION

INDICATIONS

1. Persistent and severe abdominal pain related to primary or metastatic malignancies of the pancreas, stomach, esophagus, biliary system, liver, or retroperitoneal lymph nodes.
2. Intractable nausea and vomiting related to pancreatic cancer.
3. Prolonged abdominal pain related to chronic pancreatitis.
4. Celiac plexus block may be used as a diagnostic test for Median Arcuate Ligament Syndrome (MALS) prior to surgical release and plexectomy.

ABSOLUTE CONTRAINDICATIONS

1. Coexistence of small bowel obstruction
2. Presence of intra-abdominal abscess or sepsis.

RELATIVE CONTRAINDICATIONS

1. Absolute or functional thrombocytopenia as well as uncorrectable coagulopathy.

PREOPERATIVE PREPARATION

1. Pre-procedural labs can be obtained, which include blood count, and coagulation profile.
2. Patients should be NPO for 6-8 hours prior to conscious sedation.
3. Review prior cross-sectional imaging and past surgical history.
4. Perform a preprocedural neurological examination to establish a baseline for post procedural examinations. Focus on baseline GI motility.
5. The patient should be given the BPI-SF and asked to fill it out for 2 days prior to the procedure to obtain a baseline pain assessment (available at http://www.npcrc.org/files/news/briefpain_short.pdf)

CONSENT

1. Discuss risks including:
 - a. Most commonly diarrhea and orthostatic hypotension can occur in up to 40% of the patients. Localized back pain may occur in up to 96% of cases.
 - b. Serious complications include bleeding, infection, and sensory deficits occur in less than 2% of cases with paralysis reported in only 0.15% of cases.
2. Specific risks vary by patient positioning and needle approach

PROCEDURE

1. CT guidance is the most effective and safest modality used. In the angiography suite, the combination of cone-beam CT and fluoroscopy can be used.
2. The patient is positioned on the procedural table in order to provide the safest route of access. Potential positions include prone, supine, lateral decubitus, and oblique. Following satisfactory positioning, the skin entry site is cleaned in the typical sterile fashion and the subcutaneous tissues are anesthetized with lidocaine.
3. Several techniques have been described including the posterior para-aortic, anterior para-aortic, posterior transaortic, and transintervertebral disc approaches. Choice of technique should be determined by operator preference, patient anatomy, and comorbidities (e.g. inability to tolerate prone positioning). Two techniques are described here.
 1. For the posterior para-aortic approach, one 20-24 gauge needle is inserted via an oblique approach through the paraspinous muscles and course alongside the vertebral bodies while taking care to not contact the transverse processes, kidneys, ribs, and major vascular structures. The needle tip should rest within the antecrural space anterior to the aorta and between the celiac and superior mesenteric artery origins. The needle should pass through the retrocrural space so that after the antecrural injection, the needle may be pulled back to inject into the retrocrural space. A similar course and tip position is used with the lateral decubitus position.
 2. The anterior para-aortic approach consists of one 20-24 gauge needle inserted through the anterior abdominal wall, positioning the needle tip in the retrocrural space, while also passing through the antecrural space. After injection into the

retrocrural space, the needle may be withdrawn to inject into the antecrural space. This approach frequently traverses some of the upper abdominal organs which may include the stomach, pancreas, or liver. A lateral approach is performed similarly with the patient supine. The stomach is intentionally traversed with the lateral approach.

4. Both antecrural and retrocrural injection should be used, if attainable. Antecrural injection causes lysis of the celiac plexus while retrocrural injection causes lysis of the splanchnic nerves. After placement of the needle, contrast may be injected to confirm the location of the needle tip. Then, bupivacaine may be injected to confirm appropriate spread of the fluid.
5. After appropriate placement is confirmed, neurolytic agent is injected. The most commonly used neurolytic agent is 95-100% absolute ethanol. In the antecrural space, 30-50ml of neurolytic agent is injected. The retrocrural space position only requires 15-30 ml of neurolytic agent due to it being a confined space.
 1. Phenol may be used instead of ethanol as it has been shown to similar in its ability to reduce pain. Phenol causes an immediate anesthetic effect, and is thus painless during injection. However, phenol is viscous and may be harder to inject.
 2. Cryoablation has also been described as an alternative to neurolytic agents, with a statistically significant decrease in reported gastrointestinal symptoms. The procedure replaces the needle with two 17-gauge cryoablation probes, positioned into the celiac plexus bilaterally. The celiac plexus was cryoablated with two freeze cycles for 8-10 minutes separated by 3-5 min thaw cycles.
 3. Non-neurolytic celiac plexus blocks commonly use a mixture of 20ml of bupivacaine 0.025% and 6mL of triamcinolone 80mg.
6. Prior to removal of the needle, the lumen is flushed with a small amount of saline to prevent leakage of alcohol into the non-targeted soft tissues as it is removed.

POST-OPERATIVE CARE

1. Postprocedural care usually consists of recovery in the post-anesthesia care unit with discharge shortly after recovery. Intravenous fluid administration may be utilized to maintain adequate blood pressure.
2. Continue antihypertensives to prevent rebound hypertension and myocardial ischemia.
3. A focused neurologic examination should be performed to assess for any inadvertent damage to the nervous system including motor function loss or paresthesia.

COMPLICATIONS

1. Most post-procedural complications are minor and transient in duration. These include back pain (typically lasting less than 72 hours) in 96%, orthostatic hypotension in up to approximately 50%, and diarrhea in up to approximately 45%.
2. More severe complications are rare. These potential complications include neurologic injury to the anal and bladder sphincters, monoplegia, arterial dissection, pneumothorax, abscess, hematoma, intervertebral disk injury, hematuria, or pericarditis.
3. Major complications of lower extremity paralysis with loss of bladder and bowel function occur in less than 0.15% of patients.

FOLLOW UP

1. The patient should complete the BPI-SF for 2 days after the procedure, with a telephone follow-up to assess change in pain severity and documentation of pain scores in the medical record. This provides a new baseline for subsequent pain management.

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