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Ultrasound Guided Celiac Plexus Neurolysis: An Option for Intractable Pain in Resource Poor Settings

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Abstract
The alleviation of suffering in cancer patients is universally acknowledged as a cardinal goal of medical care. Upper abdominal pain associated with malignancy is often difficult to control with analgesics and can be severely debilitating with significant impairment of quality of life. In these patients, percutaneous image-guided celiac plexus neurolysis is an effective treatment option in managing pain with a low complication rate.We report a case of anterior paramedian percutaneous sonographic-guided celiac plexus neurolysis(CPN).
Key Words; Malignancy, Celiac Plexus Neurolysis, Sonographic

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I. Introduction

In patients with upper abdominal malignancy, percutaneous image-guided celiac plexusneurolysis is a minimally invasive therapeutic modality which, when used as part of a multimodal approach to pain management, can help decrease pain, improve function, and reduce opiate dependence[1].Due to limited treatment options in low resource settings and cost, invasive procedures are usually not considered in patients that have had previous surgical intervention for advanced malignancies or terminal illness.

The small paravertebral sympathetic ganglia are located anterolaterally along the entire length of the vertebral column extending from the upper neck to the ganglion impar at the sacrococcygeal junction, which is the terminal ganglion of the sympathetic nervous system[2,3]. The paravertebral sympathetic ganglia connect preganglionic nerves from the spinal cord with postganglionic fibers of thoracic,abdominal, and pelvic organs. The paravertebral sympathetic chain has an important role in regulating blood flow, digestion, sweating and pain. The ganglia may be categorized into thoracic, lumbar, and hypogastric regions. The celiac plexus lies anterior to the aorta and the crus of the diaphragm at L1 level.[3]

II. Case Report

A 62-year-old woman being managed for advanced pancreatic carcinoma was admitted on account of severe intractable upper abdominal pain that was unresponsive to oral pain medications which had worsened over the previous 3 months. She had triple bypass 5 months earlier when she only had obstructive jaundice. Vital signs revealed a pulse rate of 80 beats per minute, blood pressure of 100/72 mm Hg, and temperature of 97.80°F (36.5°C). Abdominal examination revealed severe tenderness of the upper abdomen with palpation. Ultrasound and Computed Tomography(CT) of the abdomen and pelvis showed ascites, a pancreatic head mass, and liver metastases. The patient was admitted to the hospital and given multimodal analgesia of diclofenac, paracetamol and Intravenous(IV) morphine sulfate for relief of pain. The patient's abdominal pain persisted despite high doses of opiate analgesics. The interventional radiology service was then requested to perform a celiac plexus neurolysis (CPN).

Ultrasound was performed using LOGIQ V General Electric ultrasound machine fitted with a 3.5 MHz curvilinear transducer.An ultrasound guided trans-abdominal right para midline injection of the neurolytic agent was done after visualization of the celiac artery giving off the splenic and right gastric arteries. A trans-hepatic approach using a spinal needle size 20 was performed. After aspiration of theneedle to ascertain no blood return, a mixture of 20 ml ethanol and 15ml bupivacainewasinjected at the base of the celiac artery. After the celiac plexus neurolysis, there was an immediate relief of the pain symptom with the patient becoming calm and

communicating more appropriately. The Visual analogue scale (VAS) was 1 as against 10 before the CPN.There were no post procedure complications, and the patient was discharged the next day.

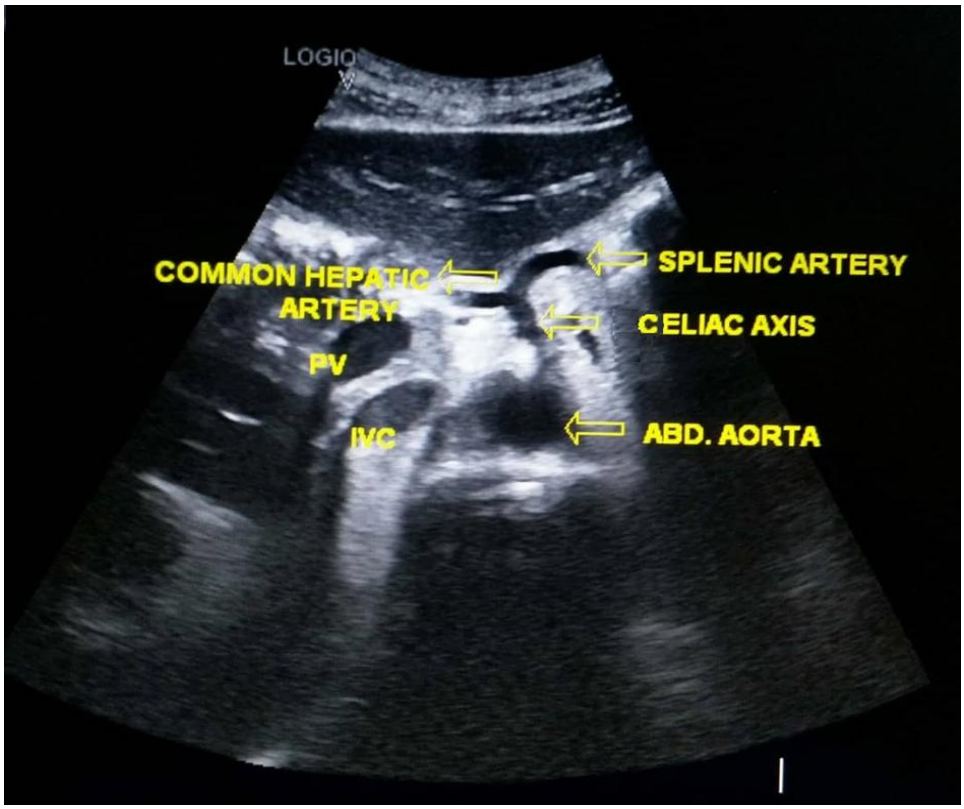

Figure: Transabdominal ultrasound image showing site of neurolytic agent injection at the base of the celiac axis. PV= Portal vein, IVC=Inferior vena cava

III. Discussion

The control of visceral upper abdominal pain remains a challenge in patients with advancedcancer. Pain control is one of the most important aspects of quality of life maintenance during the treatment ofcancer patients, who often are in an advanced stage of the disease, with a short life expectancy.[4] Poor health facilities in third world countries like our setting makes access to health care very challenging as patients have to pay for health care that is in most cases sub optimal. Opiates are not readily available, and majority of the population cannot easily afford them. High doses of these drugs are needed to control pain and the health worker is usually reluctant to prescribe such high doses of the drug due to complications of side effects and dependency.The health structure that is needed to manage the side effects of opiate use is also not well established in this environment. Health workers function with the resources available and meeting the needs of the patients falls short of what is necessary to make life comfortable for the patient with advanced malignancy. Unfortunately, many patients have resistance to pain medication and suffer a lot form the side effects of opioids. This was the exact scenario in the index patient, who had triple bypass and developed resistant upper abdominal (intractable) pain hence,celiac plexus neurolysis was considered. Celiac plexus neurolysis (CPN) is an ablative procedure of the celiac plexus that aims to destroy afferent pain transmitting fibers from abdominal viscera of the ganglia. It can be chemical, thermal or surgical, with the chemical method being limited to alcohol or phenol.[5]

The neurolytic agent can be introduced through several routes into the celiac ganglion. These can be open surgery, Computed Tomography (CT)-guided, Magnetic Resonance Imaging (MRI), fluoroscopy, and ultrasonography which can be percutaneous or endoscopic ultrasound guided.[6]

The percutaneous ultrasonography was the route of choice in this case because it is simple and inexpensive, the aorta, celiac artery and superior mesenteric artery(SMA) are easily identified and the diffusion of the neurolytic agent may be seen.[3,6,7] However, it is operator dependent and the retroperitoneal structures cannot easily be seen.[8]Our patient did well immediately post procedure with the Visual Analogue Scale (VAS) for pain dropping from 10 to 1, this is in keeping with similar studies which has reported good pain control with percutaneous ultrasonographic guided Celiac plexus neurolysis.[1,9-12] No complication was reported from the procedure, however, she succumbed to her illness 4 months post procedure.

IV. Conclusion

We reported a case of anterior paramedian percutaneous sonographic guided celiac plexus neurolysis (CPN). This case report is of significance in that percutaneous ultrasonographicceliac plexus neurolysis can easily be done and should be done at an earlier stage in the management of intractable pain for advanced upper abdominal malignancy in a resource poor setting even after previous surgery.

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