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# CELIAC PLEXUS BLOCK IN MANAGING INTRACTABLE PAIN IN A PATIENT OF CHRONIC PANCREATITIS- CASE REPORT

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**ABSTRACT** After a notwithstanding appearance as a surgical anaesthetic in early decades of 20th century, coeliac plexus blockade has evolved exponentially and has assumed significant importance in practice of interventional pain management. Modification of existing techniques, pharmacological innovations (local anaesthetic to alcohol), advent of radiographic aids (fluroscopy, CT-scan) and stream-lining of training methodology has rendered the practice of coeliac plexus blockade and neurolysis an essential aspect of anaesthesia caregiving to the general population at large.

Chronic Pancreatitis is a chronic inflammatory disease of the pancreas which results in debilitating abdominal pain and increased morbidity. We report a case of celiac plexus block in chronic pancreatitis for management of intractable pain.

**KEYWORDS :**

## INTRODUCTION

Coeliac plexus and sphlanchnic plexus blockade with local anaesthetic (LA) were introduced as early as in 1914, primarily for surgical anaesthesia. Soon, over the ensuing few decades, the emergence of subarachnoid block, variable results and technical demands of coeliac plexus block (CPB) and introduction of neuromuscular blocking drugs into clinical practice of anaesthesia, led to the disfavor of CPB among anaesthesiologist for surgical anaesthesia.[1]

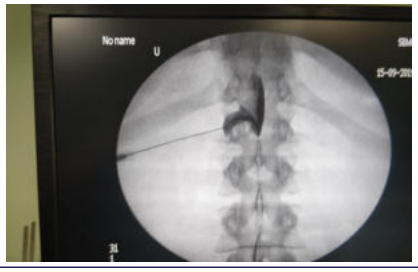
Mid-20th century saw an expected but atypical crossover of the utility of CPB from a surgical anaesthetic to speciality of pain management. CPB was finally introduced to palliate abdominal pain secondary to a variety of aetiologies. In 1947 ***Gage and Floyed*** described use of CPB in alleviating pain of pancreatitis.[2]

## CASE REPORT

A 60-year-old man presented with upper abdominal pain for 2 years, pain was excruciating with acute onset for 7 days. Conservative management with antispasmodic drugs, paracetamol and tramadol failed to give significant pain relief. This patient was planned for Celiac plexus block under C-arm guidance. His pre-procedure investigations were within normal limits.

Patient was taken to the operation theatre and intravenous line was secured and standard monitors were connected and patient was pre loaded. He was made to lie in prone position and C-arm was taken in AP view. After identifying the L1 vertebrae, C-arm was tilted caudally to square L1 vertebra and then tilted obliquely on left side till left transverse process of L1 vertebra is merged with lateral border of L1 vertebral body. At this point a triangle can be imagined which is bounded medially by lateral border of L1, laterally by 12th rib and base by a imaginary horizontal line drawn laterally from lower border of L1 vertebral body. A 22G 15 cm spinal needle was then introduced at the middle of the triangle till it crosses the anterior border of vertebral body. Then we pierced a robbery structure (posterior wall of aorta) and we could see blood through the needle. We injected dye which was seen vanishing caudally. We advanced the needle further and now dye appeared and seen moving with aortic pulsation.

After confirmation of dye in AP and Lat view, we injected 7 ml of 1% lignocaine and injected with 40mg of MethylPrednisolone. Post operative follow up was done and the patient had adequate pain relief.




## DISCUSSION:

Coeliac 'plexus' (ganglia and interconnecting fibers that converge in a well defined location) is the largest plexus of sympathetic nervous system that innervates the upper abdominal organs (pancreas, diaphragm, liver, spleen, stomach, small bowel, ascending color and proximal part of transverse colon, adrenal glands, kidneys, abdominal aorta, mesentery) derived from embryonic foregut.

### Techniques of coeliac plexus block *Posterior (retrocrural) approach*[3,4]

The technique was originally described by Kappis and refined later by Moore. It involves needles placement postero-cephalad to diaphragm in the retrocrural space, the injectate spreads up cephalad blocking coeliac plexus. The patient is positioned prone, with the pillows placed beneath the iliac crests and chest. Surface marking identifies the needle insertion sites, which lies immediately caudal to the 12th rib, 7.5 cm lateral to the midline . After subcutaneous infiltration of local anaesthetic, a 22 G 15cm needle is inserted on left side at an angle of 45° from horizontal, and advanced following the direction of 12th rib medially until contact is made with the vertebral body of L1. The needle is then withdrawn a bit and redirected to graze by the vertebral body to a point 1-2 cm beyond anterior margin of the vertebral body or until aortic pulsation is felt. The procedure is repeated on the right side and contrast medium is injected after negative aspiration under fluoroscopic guidance. Neurolysis is carried out with 15 ml of 50% alcohol diluted with equal volume of 0.5% bupivacaine through each needle.

### *Anterior approach*[5,6]

Anterior abdominal approach requires placement of needle anterior to the diaphragmatic crus (at or between the coeliac or superior mesenteric arteries). The patient is positioned supine on fluoroscopy table and skin infiltration with LA is carried out in midline epigastrium deep down to the peritoneum. A 20G, 15cm needle is introduced at the midline of epigastrium and is advanced perpendicular to the skin until the needle tip touches the body of L1 vertebra. The needle is pulled back 1-2cm, negative aspiration ascertained and few out of contrast injection under fluoroscopic guidance confirms correct needle - tip placement. This is followed by 40ml of injectate (alcohol/LA).

Advantages of this method include low rate of complications (a lower risk of neurologic injury related to the neurolytic solution spread to somatic nerve roots) and reduced patient discomfort (prolonged prone positioning avoided).

Disadvantages are secondary to passage of the needle through the liver, stomach, small/large bowel and pancreas to reach the coeliac ganglia and include, risk of infection, haemorrhage and fistula formation. Ultrasound or CT-guidance is desirable although fluoroscopy can be utilized to carry out the technique.

### *Transaortic approach*[7]

The needle is placed immediately anterior to the aorta and is advanced

gradually with intermittent aspiration till aorta is entered as evinced by appearance of blood. It is advanced further till blood aspiration ceases and then the dye is injected. Fluoroscopy confirms correct needle position; in lateral projection, the needle tip projects just ventral to the anterior edge of the lower third of the body of L1 (fluoroscopy after contrast medium shows a predominant preaortic pulsating patch distributed along the route of the aorta, in the area extending from T12 to L1); and in posteroanterior projection; the needle lies in a plane between the left lateral edge of the body of L1 and spinous process (fluoroscopic images showing a distribution of the contrast medium covering most of L1, particularly the left sides). Neurolysis is carried out with 20ml of 50% alcohol diluted with equal volume of 0.5% bupivacaine.

***Transcrural approach***[8]

With this technique, the needle pierces the crus of diaphragm to finish anterior and caudad to the diaphragm in the same plane as of aorta, anterior to it. This approach is carried out by advancing the needle 1-2 cm further than that with the retrocrural technique. This places needle tips lateral to and approximately at the anterior wall of the aorta on the left and at the same depth correspondingly, on the right. A loss of resistance is perceived once the crus of the diaphragm is passed. Importantly, there should be no resistance during injection. The contrast media appears as a linear para-aortic spiral with predominance on the injected left side, at the level of upper margin of L2 vertebral body and cephalad when checked by fluoroscopy. CT-imaging reveal a crescentric spread around the aorta at level of coeliac axis.

In the one- needle method, the needle is inserted 4- 6cm from the midline on the left at the level of lower edge of L1 vertebral body and after passing it, advanced to the antero- lateral wall of the aorta with tip slightly adjacent (pre-aortic).

Advantages include; this approach enable a continuous catheter technique to be combined with retrocrural approach, and with the ipsilateral puncture technique, the patient can be positioned lateral.

***Transintervertebral disc approach***[9]

This technique has been recently suggested which involves the passage of the needle through intervertebral disc. Though the desirable supportive evidence is still lacking, this approach theoretically minimizes hazards of injury to the arteries to the spinal cord and serious complication (e.g. paraplegia).

***Thoracoscopic dennervation***[10]

This is an invasive video-assisted approach in which splanchnic nerves arising from the sympathetic chain are identified through parietal pleura and electrocoagulated. It require general anaesthesia.

**Radiographic guidance**[11-15]

The use of radiodiagnostic aid is essential to determine and confirm correct needle placement and the contrast media spread and virtually mandatory when neurolysis of coeliac plexus is contemplated.

***Fluoroscopy;*** modern C-arm portable fluoroscopy (static / real time) equipment can be effectively utilized for this purpose. Antero-posterior (AP) and lateral view is all that is needed to ascertain correct needle tip placement (at the level of L1 and anterolateral to it). On AP view the contrast medium should be confined to the midline, with a tendency of greater concentration around the lateral margins of the aorta. Lateral view should demonstrate a predominantly pre-aortic orientation from T12 to L2, sometimes accompanied by pulsations. Incomplete penetration of the anterior wall is reflected by a narrow longitudinal "line" image (in presence of extensive infiltration of the preaortic region by tumour, extensive pancreatic surgery or radiation therapy). In addition, spread of contrast medium (lateral fluoroscopy - wedge pattern) above the diaphragm indicates that the caudad spread through aortic hiatus is limited by the origin of diaphragm. It can also reveal a short or absent 12$^{th}$rib or presence of a L6 vertebra. It is of little or no value in establishing whether the needle has punctured an organ, the exact distance of needle tip anterior to L1, or defined spread of the injected solution.

***CT-scan*** guided technique allows precise placement of the needles, reduces risk of organ injury and is especially preferred when normal anatomy is distorted by malignancy. Additionally, CT-scan can localize the coeliac axis, the depth from the vertebral body, the angle at which needle should be inserted and the identification of the surrounding structures. It provides better evidence for the final needle placement and solution spread. CT-imaging is particularly helpful when anterior and transcrural approaches are planned. A scout film is obtained to identify the T12-L1 interspace. A scan is then obtained through the interspace and is reviewed for the aorta position relative to the vertebral body, the position of intra-abdominal and retroperitoneal organs. In addition, distortion of normal anatomy (tumor, previous surgery, adenopathy) is noted. The aorta at this level is also evaluated for any aneurysm, mural thrombus or calcification. After going ahead with the coeliac plexus localisation in a standard manner, a CT scan at the level of needle tip is taken. The scan is studied for needle placement and for the spread of contrast medium. It should be seen in preaortic area and surrounding the aorta. No contrast media should be observed in the retrocrural space.

***Disadvantages includes;*** it confirms only the needle position and continuous guidance during the procedure is not possible, time consuming and expensive, requires specialist personnel and exposes patient and physician to more radiation, especially when multiple imaging is contemplated, is claustrophobic for the patient and lastly it needs the patient to remain immobile for longer period of time.

***Ultrasound*** has also been utilized to verify needle placement during CPB performed through the anterior approach.[16]

Provided that usual precautionary measures are exercised and observed, experienced physicians can safely administer CPB basing on topographic guidance alone.[17] Following a large series of study, it was not clear that use of fluoroscopy actually reduces incidence of complications. It does show, however, that CT-scan may add to the margin of safety relative to fluoroscopy but at the same time small number of complications have been also reported during its use.

Collectively, one can deduce that use of radiographic guidance must be encouraged on practical and evidence based medico-legal grounds.

**Side effects / complications**

Arterial hypotension (38%), low pain(96%), and diarrhoea (44%) are the most common complication following NCPB. Hypotension is of orthostatic nature which is primarily due to loss of sympathetic tone and consequent splanchnic vasodilatation. Hypotension warranting attention occurs in 10-30% of patients and is more common in geriatic, arteriosclerotic or hypovolemic patients.[18] Usually fluid, vasopressors and abdominal binders suffice.[19] Pain initially (upto 30 min) is pressure or burning type in epigastric, chest or mid-back immediately after administration of neurolytic solution. Later on a dull aching pain takes over and remain upto 48 hours.[20] This may be due to irritation of the diaphragm and musculature of back by the injectate. Fortunately, both types respond to intravenous opioids or oral analgesics. Sometimes, cramping bowel movement secondary to uninhibited action of the parasympathetic system on the already constipated and slugged bowel may manifest as diarrhoea. Self limiting diarrhoea has be reported in upto 60% of patients undergoing alcohol neurolysis and may be life threatening if not managed amicably. Pre-block purgation and continuation of narcotics help causing up this phenomenon.

Interestingly, patients show up with detectable alcohol odour on breath and blood alcohol concentration following alcohol neurolysis. This stays for several hours after procedure but are insufficient to produce systemic effects[21,22].

**CONCLUSION:**

Chronic pancreatitis is a chronic debilitating condition with episodes of intractable pain with continuous dull aching pain. Celiac plexus block relieves pain and adds quality to life. This should be considered when conservative medicines fail to give good pain relief.

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