

# Celiac Plexus Denudation in Triangle Dissection in Pancreatico Duodenectomy: Perioperative Anesthetic Implications

Shrestha BR,<sup>1</sup> Sharma M,<sup>1</sup> Barahi Shrestha S,<sup>2</sup> Thapa PB,<sup>3</sup> Maharjan DK<sup>3</sup>

<sup>1</sup>Department of Anesthesiology

Kathmandu Medical College,

Sinamangal, Kathmandu.

<sup>2</sup>Department of Anesthesiology

Patan Academy of Health Sciences,

Patan, Lalitpur.

<sup>3</sup>Department of GI Surgery

Kathmandu Medical College,

Sinamangal, Kathmandu.

## Corresponding Author

Babu Raja Shrestha

Department of Anesthesiology

Kathmandu Medical College,

Sinamangal, Kathmandu.

E-mail: barashrestha@yahoo.co.in

## Citation

Shrestha BR, Sharma M, Barahi Shrestha S, Thapa PB, Maharjan DK. Celiac Plexus Denudation in Triangle Dissection in Pancreatico Duodenectomy: Perioperative Anesthetic Implications. *Kathmandu Univ Med J.* 2022;77(1):119-21.

## INTRODUCTION

Pancreatic neoplasm is a common cancer of the gastrointestinal tract. It is lethal, invasive, and infiltrative to nearby structures. Radical surgical intervention is claimed to be the curative treatment option. It consists of radical tumor excision with fine dissection along the celiac axis and surrounding soft tissues between arteries, superior mesenteric artery and portal vein. The technique referred to as "Triangle dissection".<sup>1</sup>

## CASE REPORT

A 53 year old lady with a diagnosis of carcinoma of pancreas referred to the preanesthetic clinic with chief complaints of loss of appetite, body weight, intense body itching and icterus.

## ABSTRACT

This is a case report of inadvertent right celiac plexus denudation during triangle dissection during the surgery for carcinoma of pancreas under combined general epidural anaesthesia. Operative removal of the ganglia has its own autonomic effects, which are important to observe for anesthesiologists and perioperative critical care physicians alike.

## KEY WORDS

*Celiac plexus, Epidural, Hemodynamics, Pain, Triangle dissection*

Examination revealed her physiological parameters within normal values without any other known co-morbidities and medications. However, she had altered liver function (total bilirubin= 26.6 gm/dl, direct bilirubin=18.4 gm/dl) with acceptable coagulogram.

The patient was operated for Whipple's procedure under general anesthesia with thoracic epidural (Bupivacaine 0.1% plain). Hemodynamically, the patient had a good, favorable exit from anaesthesia. As the surgery proceeded, the patient was a good candidate for triangle dissection for pancreaticoduodenectomy. After 3.15 hours of surgery the patient was transferred to the surgical ICU extubated, awake with epidural charged intermittently.

The first 24 hours her postoperative period was smooth, afebrile and not in agony of pain demanding any extra analgesics, except for incisional site pain which was managed with Paracetamol injection 1 gm twice a day. Surgical drains observed- almost dry. She was conversant with maintained cardio pulmonary physiological parameters obtained from the monitoring and investigations. It was noticed that her epidurals was held for more than 12 hours with no additional analgesic demands. She had satisfactory bowel sounds, on auscultation her heart rate was around 50/min (preoperative value 70-80/min) with blood pressure in normal lower range-80/60 mm of Hg. Her 12 lead ECG showed normal pattern. The thoracic epidural was removed and she was planned to get stepped down to the surgical high care. The suspicion of inadvertent celiac plexus ganglion resection with paraaortic and peri-superior mesenteric artery lymph nodes was made.

The patient had full normal recovery course prior to discharge pain free, mobile, stable hemodynamically, except episodes of loose motion for few days which was corrected on its own.

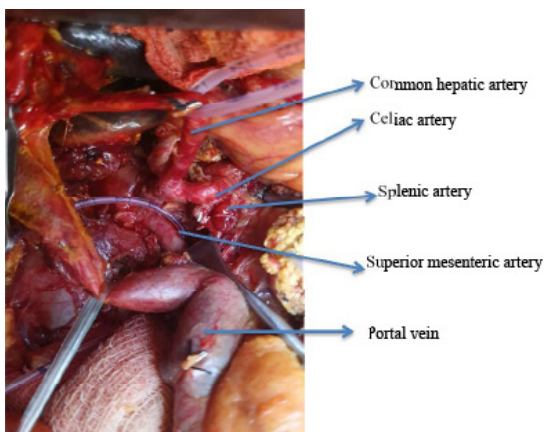


Figure 1. Triangle area bounded by portal vein, superior mesenteric artery and aorta (not visible in the picture).

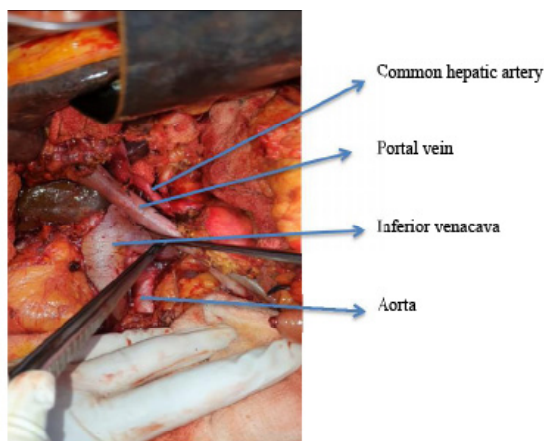


Figure 2. Completion of dissection along the celiac axis.

## DISCUSSION

The prevertebral ganglia close to the target organ are result of synopsis of the presynaptic nerves. The celiac ganglion, surrounding the branch of the aorta, is one of them. The celiac ganglion innervates organs derived from the foregut- from distal esophagus to stomach, pancreas to adrenal glands.<sup>2</sup>

The celiac plexus is a kind of principal station of autonomic nerve fibres coming down from thoracic cavity into abdominal compartment as they course toward the different organs.

Splanchnectomy has been described as a treatment option for pain arising from carcinomatous condition of the organs innervated by the plexus long back in the 1940s by Mallet-Guy.<sup>3</sup>

Celiac plexus block, neurolysis is also a treatment option to splanchnectomy in chronic pain management.

The patient in our case had not complained of pain and not demanded analgesics even after not getting epidural local anaesthetic. Neither she was on opioids. Opioids may modulate cardiovascular and sympathetic response.<sup>4</sup>

The patient, on contrary to the effect of celiac plexus block/lysis, had extreme bradycardia. Blockade of visceral sympathetic might shift the homeostatic autonomic balance in the organs towards more parasympathetic predominance with corresponding effects.<sup>5</sup> This notion seems compatible with the physiological effects exhibited by the patient in postoperative period - complete pain free status, presence of good bowel sounds, later episodes of loose motion. Surprisingly, this patient had bradycardia with stable hemodynamics which could be correlated with parasympathetic dominance and adrenal gland denudation following removal of the celiac ganglia. However, heart rate variability was not observed after celiac plexus block in some study.<sup>6</sup>

Extensive clearance of the nerve plexus in such surgery may lead to severe intractable diarrhea and malabsorption in postoperative period. At times, this might restrict quality of life in post surgical period.<sup>7</sup>

The current trend of triangle dissection warrants intra as well as post operative anesthetic and intensive care implications, like hemodynamic alteration due to overwhelming parasympathetic predominance. This possibility thus demands comprehensive preanesthetic evaluation and anesthetic endeavors accordingly.

Triangle dissection in pancreaticoduodenectomy warrants meticulous anesthetic vigilance to avoid and at times overcome the after effects of possible ganglionic resection.

**REFERENCES**

1. Chowdappa R, Challa VR. Mesopancreas in pancreatic cancer: where do we stand - review of literature. *Indian J Surg Oncol*. 2015 Mar;6(1):69-74. PMID: 25937767.
2. Yang HJ, Gil YC, Lee WJ, Kim TJ, Lee HY. Anatomy of thoracic splanchnic nerves for surgical resection. *Clin Anat*. 2008 Mar;21(2):171-7. PMID: 18288763.
3. Beveridge TS, Johnson M, Power A, Power NE, Allman BL. Anatomy of the nerves and ganglia of the aortic plexus in males. *J Anat*. 2015 Jan;226(1):93-103. PMID: 25382240.
4. Carter JR, Sauder CL, Ray CA. Effect of morphine on sympathetic nerve activity in humans. *J Appl Physiol*. 2002 Nov;93(5):1764-9. PMID: 12381764.
5. Yamamuro M, Kusaka K, Kato M, Takahashi M. Celiac plexus block in cancer pain management. *Tohoku J Exp Med*. 2000 Sep;192(1):1-18. PMID: 11128864.
6. Arai YC, Morimoto A, Sakurai H, Ohmichi Y, Aono S, Nishihara M, et al. The effect of celiac plexus block on heart rate variability. *J Anesth*. 2013 Feb;27(1):62-5. PMID: 22907708.
7. Ischia S, Polati E, Finco G, Gottin L, Benedini B. Labat Lecture: the role of the neurolytic celiac plexus block in pancreatic cancer pain management: do we have the answers? *Reg Anesth Pain Med*. 1998 Nov-Dec;23(6):611-4. PMID: 9840859.