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Research Article

CELIAC PLEXUS BLOCK IN THE MANAGEMENT OF PAIN DUE TO PANCREATIC CANCER: COMPARISON BETWEEN PERCUTANEOUS AND EUS INJECTION TREATMENT

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Abdominal pain is an important clinical symptom of the Carcinoma of the pancreas. Medical management of the pain is always difficult. Celiac plexus neurolysis can be performed for control of pain in pancreatic carcinomaeither by percutaneous transaortic technique, under Ct scan control or by EUS guided technique. The aim of our study was to compare the patient satisfaction, and the sides' effects, when performing a coeliac plexus block for control of pain in pancreatic carcinoma either by percutaneous transaortic technique under fluoroscopy control or by EUS guided technique.

INTRODUCTION

Carcinoma of the pancreas has increased in incidence during the last decades. Abdominal pain is an important clinical symptom. It occurs in 80 – 85% of unresectable pancreatic tumor and can be severely debilitating [1, 2]. It has been shown that animals with implanted tumors have accelerated tumor growth and increased mortality rates when subjected to pain or stress some data suggest that pain in pancreatic cancer patients may be associated with decreased survival [3].

Therefore the management of pain for patients with pancreatic cancer is one of the most important aspects of their care. Palliation of symptoms to optimize the quality of life is of primary importance for both the gastroenterologist and the pain management specialist.

Analgesia can be provided by medical management with analgesics including NSAID drugs and narcotics. Anti convulsions and antidepressants may be used as adjuvant. Patient'sresponses are often unpredictable and variable with various side effects. NSAID can cause gastrointestinal disturbances and cardiovascular events. Prolonged use of narcotics is associated with many side effects, dry mouth, constipation and development of drug dependence.

Analgesia can also be achieved via a celiac plexus block (CPB). It consist of a chemical splanchnicectomy, its goal is to ablate the efferent nerve fibers which transmit pain from the intra-abdominal viscera. A study by kawamata et al. comparing between celiac plexus block and morphine treatment on quality of life in patients with pancreatic cancer pain showed a better performance status and less pain by visual analog pain scale in the group that underwent a celiac plexus block when compared to the group that received narcotics and non-steroidal anti-inflammatory drugs.

Celiac plexus neurolysis can be performed using different approaches either percutaneously, under fluoroscopy or CT scan control, surgically or under EUS guidance.The aim of our study was to compare the patient satisfaction, and the sides' effects, when performing a CPB for control of pain in pancreatic carcinoma either by percutaneous transaortic technique under fluoroscopy control or by EUS guided technique.

MATERIALS AND METHODS

Patients diagnosed with pancreatic carcinomas and presenting with intractable pain not controlled by narcotics and NSAIDs were recruited. They were documented as having pancreatic carcinomas based on clinical features and confirmed by CT scan imaging. They all had persisting severe abdominal pain despite high doses of opiates.

The study was performed at the Notre Dame De Secours university hospital. After approval by the ethics committee of the hospital and written informed consent.40 patients (ASA I, II, III) withinoperable pancreatic adenocarcinomas were randomly assigned to receive a celiac plexus block.

25 patientsperformed either under percutaneous fluoroscopy transaortic route, 15 patients performed by endoscopic ultrasound guided celiac block using a random chart allocation. Subjects having coagulopathies disorders (INR>1.5, platelet count <50000) aortic aneurysm, aortic mural calcification, aortic mural thrombus or previous disease of the upper gastric tract were not included in the study.

Patient`s existing medications, including narcotics , NSAID, Tramadol, Morphine were continued during the period before the procedure , and stopped post celiac plexus block .A specific chart was explained and followed by a registered nurse not directly involved in the study .on this chart we noted the time to perform each procedure , need for heavy sedation ,overnight stay at the hospital and total cost of each procedure along with patient satisfaction based on a visual analogue pain scale of 10 (range0 – 10) with "o" representing no pain and "10" representing very severe pain obtained before performing the procedure at days 1,7 ,21, 60. Both techniques were performed by an experienced anesthesiologist and endosonographer.

After placing the patient on continuous ECG, non invasive arterial pressure, and respiratory monitoring with pulse oximetry andcapnography, time was noted, a baseline pain score was obtained and an IV access was established with normal saline to avoid hypotension.

15 patients were treated with EUS-guided celiac plexus block in the endoscopic room, with deep sedation (midazolam – fentanyl – propofol) and a period of fasting over midnight, under the guidance of linear array endosonography using a 22 gauge FNA needle, inserted on each side of the celiac area at the level of celiac axis, followed by injection of 10 cc bupivacaine (0.25%) and on each side of the celiac plexus, followed by injection of 20 cc. of 98% dehydrated alcohol. The patient is then transported to the recovery room.

25 patients were treated with percutaneous fluoroscopy-guided plexus block in the pain department, without sedation, in the prone position with a pillow under the abdomen to flex the lumbar spine to obtain an adequate antero-posterior view and visualize the T12-L1 disc. A tunnel view was used for needle insertion and target point in the tunnel vision was just lateral to the midline of L1 vertebrae. Local anesthetic was applied with 5ml 1% lidocaine at the needle insertion. A 22-gauge 17 cm long spinal needle was inserted and advanced. A loss of resistance is felt as the posterior aortic wall is penetrated, and arterial blood is observed upon stylet removal. A loss of resistance syringe containing sterile, preservative-free saline is attached to the needle, which is slowly advanced through the aorta with constant, gentle pressure on the plunger. As the needle penetrates the anterior wall of the aorta, an increase in resistance on the plunger occurs. A loss of resistance then ensues once the needle extends past the aortic wall and into the retroperitoneal area, adjacent to the celiac plexus. Three to 10 mL of radiographic contrast injected to confirm proper spread of solution anterior to the crura and along pre-aortic tissue plane

RESULTS

There was no technical failure or serious side effects related to the twoprocedures. Release of pain is equal in the two groups. Transient hypotension occurred in 2 patients with EUS- CPB (13.33 %) and with 3 patients with FPT- CPB (12%) probably due to splanchnic pooling of blood. MeanDuration of hypotension is about 10 minutes treated successfully by injection of epinephrine. Transient episodes of diarrhea lasting 12 to 72 hours were observed in 2patients with EUS-CPB (13.33%) and 2 patients (12%) with FPT-CPB secondary to unopposed parasympathetic activity. One patient with FPT-CPB develops pneumothorax.

The mean time of FPT-CPB is 15 minutes compared to 30 minutes with the EUS-CPB, and the price is lesser with percutaneous technique.

DISCUSSION

The coeliac plexus is also known as the solar plexus. It is situated below the diaphragm (ante- crural), lies within the retroperitoneal space embedded in loose areolar tissue, with the aorta lying posteriorly, pancreas stomach and left renal vein anteriorly, and inferior vena cava laterally. it is composed of a series of ganglia that relay the preganglionic sympathetic fibers derived from the greater (t5-t10) lesser (t10-11) and least (t12) splanchnic nerves with the parasympathetic fibers from the celiac plexus branch of right vagus to form the post ganglionic fibers supplying the upper abdominal organs (liver, gall bladder, spleen, stomach, pancreas, kidneys, small bowel, and 2/3 of the large bowel). It transmits pain sensation originating from these abdominal viscera to the thalamus and cortex of the brain. The ganglia varies in number (1-5), size (diameter 0.5-4.5cm), and location (t12-L2) but cannot be visualized as distinct structures by any kind of imaging. [4, 5]

Pancreatic tumor may directly infiltrate the pancreatic nerves causing neuropathic pain which may in part explain the severe pain experienced by the patients [6]. Perineural invasion extending into extrapancreatic nerves may preclude curative resection [7]. Furthermore pain can be secondary due toan inflammatory process caused by pancreatic cancer that sensitize the intrapancreatic nerves to chemical and mechanical stimuli and increased ductal and interstitial pancreatic pressures inducing pancreatic "compartment syndrome" [2]. All these factors lead to a state of "Centrally sensitized" pain where repeated visceral afferent stimulation can result in a increased sensitivity, decreased threshold to stimulation, enhanced response to stimulation and amplification of pain [8].

The current management of pancreatic pain follows the WHO2008 recommendation for pain control, starting with non-opioid analgesics such as nonsteroidal anti-inflammatory drugs (NSAIDs) and opioid analgesics [9]. However, duration of pain relief appears to be limited and increasing doses of opioids are required leading to unacceptable side effects such as nausea, constipation, somnolence, confusion, dependence, addiction and deterioration of quality of life. Therefore, a celiac plexus block, a chemical splanchnicectomythat ablates the efferent nerve fibers that transmit pain to the central nervous system, is indicated.

CPB have been reported to provide excellent pain relief in up to 85% of patients [10].

It allows reduction in opioid's consumption, and improvement of quality of life [10, 11]. Timing of CPB is also an important issue. In a retrospective study of percutaneous CPB with steroids, pain relief was experienced in those who did not develop narcotic dependence [12]. Therefore some authors believe that CPB block should be performed before intractable pain appears.

The CPB technique was first described in 1919 by Kappis et al [13]. Before the 1970s, celiac plexus blocks were performed blindly and since then many modifications have been introduced to improve the safety and quality of block.

The importance of using radiologic guidance with fluoroscopy for correct insertion of the needle tip was stressed by Hegedus in 1979 [14]. Endoscopic ultrasound (EUS) guided celiac plexus neurolysis was first described by wiersema in 1996 [15]. The authors visualized the celiac plexus with EUS and then performed the neurolysis via the transgastric route. Since then, there has been increasing use of this technique and subsequent studies confirmed its safety and efficacy. [7]

Although many original reports and review articles have focused for many years on the techniques and degree of pain control.

The present study differs from previously published literature in that it compares the patient satisfaction, time consumption and economical aspect when performing NCPBusing both methods.

CONCLUSION

Celiac plexus neurolysis can be performed for control of pain in pancreatic carcinoma either by percutaneous transaortic technique or by EUS guided technique. The patients comparison of satisfaction, sides effects, time consumption and economic aspect, between the 2 techniques, conclude that the percutaneous one still a good indication.

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