Original Article

Celiac Plexus Neurolysis Using Three Different Techniques for Upper Abdominal Metastatic Pain: Comparison the Effectiveness of the Block

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Abstract:

33 patients [13 female] with metastatic intractable upper Abdominal Cancer Pain were treated with celiac plexus neurolytic block with 60% alcohol. Aim of study is to observe the effectiveness of three different techniques of celiac plexus block, unilateral paravertibral, bilateral paravertibral and Paravertibral transaortic approach of celiac plexus blocks under C- arm guidance. Satisfactory pain relief occurs in all three techniques but out- come of transaortic approach a little better than other methods. Pain intensity was assessed by VRS and VAS Scale. Celiac plexus blocks are a suitable technique for upper abdominal visceral metastatic pain. Its effects are prolonged and also increase bowel movement, improve appetite and reduced morphine consumption. This is an initial study and numbers of subject are few. So more study required to get conclusive result. Skilled manpower and appropriate case selection is mandatory for successful results.

Introduction:

Pain may be the early symptom of Cancer in 25-30%of all cancer patients and 70-90%of all advanced or terminal cancer patient must cope with chronic pain syndrome related to chemo-therapy, failed treatment or tumor progression.[1,2] pancreatic metastatic visceral pain is a complex mixture of noceceptive and neuropathic type that are likely to be driven through different mechanisms.[3] Patients who have chronic intractable abdominal pain either malignant or benign that are unresponsive with large doges of narcotics can be treated with this procedure. This block reduced narcotic requirement and limit narcotic dose related side effects.[4,5] Celiac plexus is a complex network of nerves situated in the abdomen surround the celiac trunk, superior mesenteric artery, renal artery. It is behind the stomach, omentum bursa and in front of crus of diaphragm at the level of 1st lumber vertebrae. It consists of visceral ganglion with a network of inter connecting fibers. Pancreatic cancer usually metastasis in the surrounding areas including stomach, gall bladder, liver, Spleen, intestine, colon and omentum and amy be associated with intestinal obstruction. Visceral afferent fibers carries to the CNS through Splncnic nerve which synapse through celiac ganglia before reaching central nervous systems.[6] Neurolytic celiac plexus block interrupt transmission of pain pathway and prolonged analgesia occurs.

Materials and Methods:

We treated 33 cases (13 females) of upper abdominal cancer pain with celiac plexus neurolytic block. Age of the patients ranging from 35-70 years.

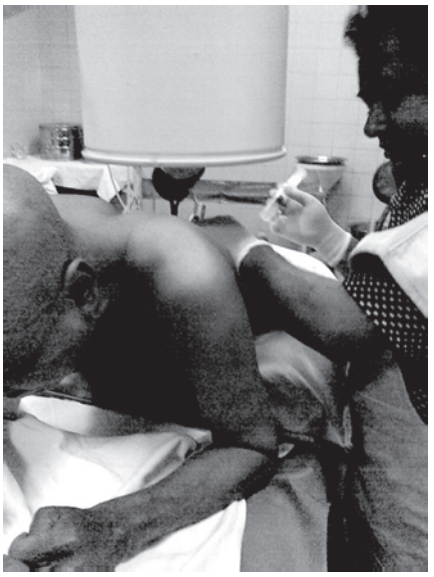

Fig: Techniques of Celiac plexus block with C arm P A view

Fig: Position of the patient & technique of CPB with Lateral view of C arm

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Table I: Demographic features of study subjects

	Bilateral Pravertebral block (n=12)	Unilateral (Right Pravertebral) block (n=10)	Transaortic block (n=10)	p
Age (yrs)	51±12	53±12	56±12	NS
Male: Female	7:5	6:4	6:4	NS
Duration of pain (month)	6.8±1.0	7.1±1.2	7.2±1.0	NS
Causes of pain				
Ca-pancreas	6	5	8	NS
Ca-gall bladder	4	3	2	NS
Ca-stomach	1	1	0	NS
Ca-liver	1	1	0	NS

Patients with pain confined to upper abdominal viscera and patient with haemodynamically stable and no neurological deficit are selected for the study. Patients are randomly divided into three group .Group A(n-12) received CPNB with biteleral psos approach with 15 ml 60 %alcoholach in each side. Group B (n-10) unilateral pproach in the left side, 30 ml 60% alcohol injected in left side, GroupC (n-11) transaortic approach using single needle in left side which piers abdominal aorta when tip of needle cross anterior wall of the aorta. 30 ml alcohol injected. Among 33 cases 19 patients were operated previously within 6months. 50%patients were taking morphine and NSAID. After informed concent monitors are attach for pulse, B.P.,Spo2. Patient is preloaded with 500ml N/S. Each patient positioned prone with a pillow under the lower abdomen to remove the lumber lordosis and easier to palpate the spinous process.

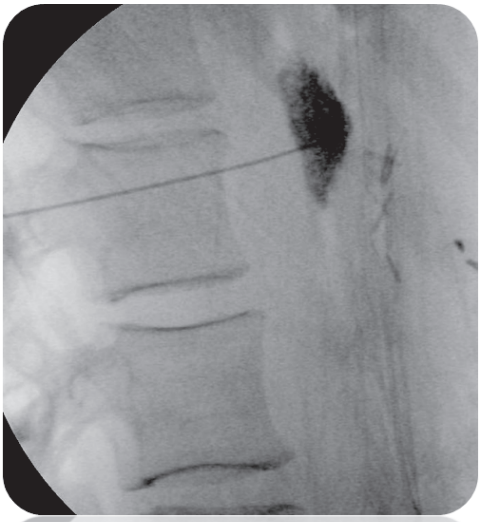


Fig: Radiological view after giving dye intransaortic approach

Before draping and prepping landmarks were drawn with an skin marker include spinous process of T12 and L1. Inferior border of 12th ribs . In Group A 22G 18cm long needle was inserted[7-8] cm from the midline bilaterally, Insertion point should be inferior to 12th rib. Needle direction toword the L1 spinous process. Needle advanced with C arm guidance passing transverse process L1 cephaloid and hit the body of L1. A skin marker is placed on the needle 2-3 cm from the skin. Needle is then walked laterally until slip lateral surface of vertebral body to anterolaleral margin ofT12-L1 inter space. Needle is advanced 2-3 cm anterior to T12 and L1vertibral body. And its position is identified with C-arm in lateral view..After proper needle placement aspiration for blood and CSF was tested. Radio- contrast dye 2 ml injected and its distribution was visualized with C-arm. If negative aspiration test. 2ml lignocaine adrenaline injected to exclude intravenous or intrathical placement of needle and than 15 ml of 60% ethyl alcohol injected in each side. In group B unilateral insertion of needle in the left side as described above and 30 ml of60%alcohol injected. In group C(11) needle is advanced another 2-3 cm beyond the anterior margin of vertebral colum while continuously aspirating. If blood is encountered, needle is likely piersed through aorta which is identified by aspiration of arterial blood with pulsatile needle. Needle advanced until it cross the anterior wall of aorta. When aspiration for blood cased. 2ml of radio-opaque dye injected and its distribution is visualized by lateral view of X ray. 30 ml 60% alcohol injected. we assessed pain just after block,.2hours, 12 hours, 24 hours, 72 hours and up to one month after blocks. In all three groups severe burning pain followed by relief.

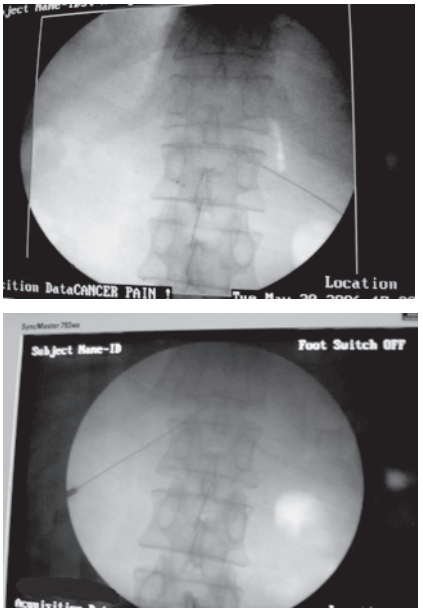


Fig: Radiological view of left sided block Fig: Radiological view of right sided block

Results:

Adequate pain relief indicated by VRS (0-1) and VAS(1-3)-In group A, 9 cases (75%), Group B 6cases(60%), In group C 8 cases (79.7%). Pain relapsed after 72 hours 10 cases (30%) which were converted to epidural blocks. Profound hypotention (systolic B.P less than 70mmhg in 2 cases), Persisting diarrhea in one case . No incident of per operative mortality. 21 patients died within one month of

Table II: Effect of Celiac block on reduction of pain as assessed by verbal pain rating Score (VRS) (%)

	Bilateral Paravertebral approach (n=12)	Unilateral (Right Paravertebral) approach block (n=10)	Transaoritic approach (n=10)
Before Block	100±.00	100±.00	100±.00
Just After Block	79±22	81±12	78±19
72hrs	70±29	59±88	64±32
Week-1	66±34	59±37	58±35
Week-2	66±32	59±39	60±35
Week-3	70±35	58±38	59±40
Week-4	68±36	69±81	57±35

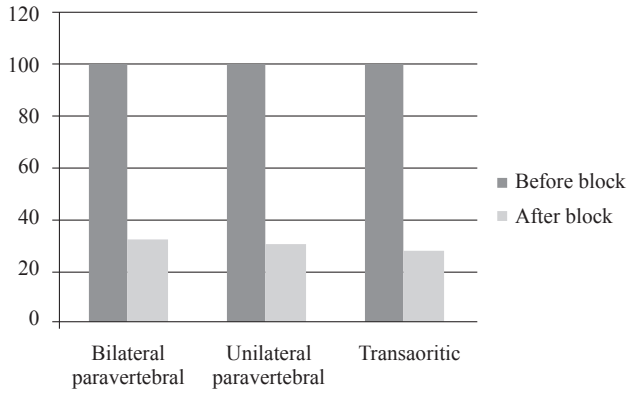
* VAlues among the three different approaches are not significantly different

Table III: Effect of Celiac block on pain as assessed by visual Analogue Scale (VAS)*

	Bilateral Paravertebral block (n=12)	Unilateral (right Paravertebral) (block=10)	Transaortic block (n=10)
Before Block	6.8±1.0	7.0±1.2	7.2±1.0
Just After Block	1.5±.8	1.7±.5	1.4±.5
72 hrs	2.7±1.6	2.9±2.1	3.2±2.5
Week-1	2.6±1.8	2.6±1.5	2.4±1.5
Week-2	2.8±1.6	2.5±1.6	2.6±1.5
Week-3	2.5±1.4	2.6±1.5	1.8±1.2
Week-4	1.9±1.0	2.0±1.1	1.9±1.2

*Values between transaortic and unilateral approach at 72 hr, Week 1,2,04 3 are not significantly different

* Values between betore block and after block in all the groups are significantly different



Discussion:

Celiac plexus neurolytic block for metastatic upper abdominal pain described initially by Kappis in 1914.[8] Pancreatic cancer pain or chronic pain is carried by the sympathetic nerve, is well managed by celiac plexus block either local anesthetic drug alone or combined with steroid or persistent block with neurolytic agents like alcohol or phenol. Ethyl alcohol 40%-100% can be used but50-60%alcohol commonly used for this purpose. 100%alcohol may cause persistent motor block.[9] Usually celiac plexus neurolytic block perform mostly by the Anesthesiologist working on pain using C-arm or CT guidance can be done by endoscopists or or intraoperatively surgeon use alcohol directly to block the plexus.[10,11] There are several techniques for celiac plexus block. Bileteral paravertibral, unilateral paravertibral, Transaortic approach Recently ultrasonic guidance anterior approach of celiac plexus block is practicing. In our study we used 3 different techniques of block and compare the effectiveness of the blocks. Injection of alcohol around the celiac artery ,and interrupt the pain pathway by destroying the celiac plexus.[12] Alcohol of 50-60% is the most commonly used neurolytic agent in CPB. As the ganglion and plexus lies anterior and lateral to aorta so in transaortic approach tip of the needle in the direct vicinity of celiac plexus and therefore, relatively smaller dose of neurolytic agent is required so it may be most reliable and effective method of celiac plexus block.[13] Mechanism of action of alcohol is by extraction of cholesterol and phospholipids from the neural cell membrane, causing precipitation of lipoprotein s and mucoproteins.[14] Some others have advocated the use of phenol 6% in water because phenol induces necrosis when applied directly to neural tissues. Reported disadvantages of phenol include its slower and shorter duration of action and increase viscosity and It may cause injury to blood vessels particularly large vessel may be damaged during celiac plexus block so its use limit in clinical practice.[15] In current practice sono-graphy is used to locate exact position of celiac axis in supine position with an anterior abdominal approach.[16] Advantage of celiac plexus neurolytic block is its prolonged duration of action which usually exceed the life expectancy of pancreatic malignancy. This block not only reduces the dose requirement of morphine but also improve constipation which is a major complication of morphine. In a study 1996 Kawamata et al compare a group received-celiac plexus block combined with narcotics to another group received narcotic and NSAIDs. They found good pain relief measured by VAS (O-2) in the Group received celiac plusex with narcotic than narcotic and NSaIDs group. The group received celiac plexus block had statistically significant reduction of morphine comsumption, improved appetite, and improved bowel movement,redused nausea and improved sleep habits and less detoriation of quality of life.[1,2]

Conclusion:

We can be concluded that celiac plexus neurolytic blocks are very effective techniques for the treatment of metastatic cancer pain of upper abdomen. It also improve appetite and reduced opoid doses and constipation which is a major problem of morphine users.[16] As the duration of neurolysis is more than the life expectancy of patient with pancreatic metastasis, So it may be the option of pain relief of such patients in the developing countries. But skilled manpower and equipment facilities should be available. This is an initial study and numbers of cases are small so more studies require for conclusive results.

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