Splanchnic Nerve Block as Minimally Invasive Procedure for Chronic Postsurgical Abdominal Pain: A Case Report

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ABSTRACT

Chronic postsurgical pain is commonly prevalent following abdominal surgeries. It imposes negative impact on patient's both physical and emotional wellbeing. Commonly, neural damage is the cause for persistent postsurgical pain, however in some instances the etiology remains undiagnosed. Splanchnic nerve block is a minimally invasive procedure that is often beneficial for chronic abdominal visceral pain. We present a case of 46 years male who came with the complaint of infra umbilical abdominal surgical scar pain for 9 months after mesh removal surgery following mesh infection. Diagnostic splanchnic nerve block was done and pain subsided by 70% immediately after the block which sustained even at two months follow up.

INTRODUCTION

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Copyright: © The Author(s) 2024. This is an open access article under the <u>CC BY</u> license. About 10 to 50% of patients after surgery develop chronic postsurgical pain. Chronic postsurgical pain is defined as chronic pain that develops or increases in intensity after a surgical procedure or a tissue injury and persists beyond the healing process, i.e. at least 3 months after the surgery or tissue trauma.

It can result in lasting functional impairments and sufferings to individuals. The cause of chronic postsurgical pain is multifactorial. Inflammation, nerve injury to tissues and nerves and modifications in central pain processing are the pathological causes resulting in persistent pain after surgery. It can be managed both conservatively and with interventional procedures. Since it is associated with neuropathic component, pharmacological management mainly includes antidepressants and anticonvulsants. Paracetamol, NSAIDs, opioids, topical lidocaine and capsaicin, ketamine, clonidine, and intravenous lidocaine infusion can also be used. However, those patients nonresponsive to conservative management and those who cannot tolerate the medicines can be benefited with interventional procedures like somatic nerve blocks, neuraxial blocks, sympathectomies.¹ Celiac plexus and splanchnic nerve block are the common sympathetic nerve blocks done for treatment of chronic abdominal pain. Splanchnic nerve block has shown pain relief for longer duration.² Here, we present a case of postsurgical abdominal scar pain who previously had undergone multiple interventional procedures and was managed with splanchnic nerve block.

Case presentation

46 years male presented with history of infraumbilical midline abdominal surgical scar pain for 9 months. Pain was pricking character, insidious onset, non-radiating, aggravated on prolonged sitting, coughing and walking and not relieved by analgesics. Pain detect tool score was 16. The numeric rating score of pain was 7/10. There is history of laparascopic appendectomy and paraumbilical hernia repair surgery (Intraperitoneal Onlay Mesh Repair) 10 months back. Mesh removal surgery was also done following mesh

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CASE REPORT

infection 9 months back. On examination, scar was healthy and mild diffuse tenderness was present over the scar and adjacent areas in abdomen. Carnett's test was positive over scar region. He was suspected as case of anterior cutaneous nerve entrapment and hydrodissection of anterior cutaneous nerve was done twice. But pain did not subside. After positive diagnostic block, cryoneurolysis of T10 and T11 intercostal nerve was also done following which pain subsided by 50%. However, pain returned to baseline pre procedural level over 3 days. In view of multiple failures of somatic nerve block and possible peritoneal manipulation during his initial surgery, visceral origin of pain was suspected. So, he was planned for diagnostic splanchnic nerve block and its radiofrequency ablation in case of positive block. Prior to the procedure, informed written consent was obtained and patient was kept nil per mouth for 6 hours. The procedure was done in operation theatre with ASA standard monitoring. Routine and emergency drugs and fluoroscopy were readied. Intravenous access was obtained with 20 Gz IV cannula. 500 ml of normal saline and Inj Ceftriaxone 1 gm was given intravenously before the procedure. The patient was then laid in prone position. C arm fluoroscopic views were used to identify the vertebral body and transverse processes of the right and left T11 and T12 vertebra. After squaring of end plates, C arm was tilted to ipsilateral side. The needle entry point was the junction of the rib and vertebral body just above the lateral border of the vertebral body. Under all aseptic conditions, 2 ml of Inj 1% Lignocaine (preservative free) was infiltrated in the skin. Under C arm guidance, 22 Gz spinal needle was inserted and the end point of needle insertion was the junction of anterior one third and posterior two third of vertebral body in lateral fluoroscopic view. Water soluble contrast (lohexol) was administered to rule out intravascular spread. Then, 2 mL of Inj 2% lidocaine (preservative free) was injected to all of the four sites at T11 and T12 level. Pain decreased by 70 % immediately after the procedure. At 2 months follow up, numeric pain rating score was reported to be 3/10. On verbal rating scale, pain reduced by 70% even at two months post procedure.



Figure 1: Lateral fluoroscopic view showing needle end position at junction of anterior one third and posterior two third.



Figure 2: Anteroposterior fluoroscopic view showing needle at junction of 11th rib and T11 vertebral body along the lateral border of T11

DISCUSSION

The incidence of chronic postsurgical pain is about 17-21% after any abdominal surgery.³ Chronic abdominal pain is complex and multifactorial. It results in lower quality of life and also adds to patient's financial burden.¹ The cause can be somatic or visceral in origin. Neural damage and postsurgical adhesions can also be source of pain in chronic postsurgical pain.² Carnett's test is usually done to clinically diagnose abdominal wall pain and rule out visceral origin. However, this test may be false positive even in visceral cause if local parietal peritoneum is involved. Transversus

abdominis plane block, ilioinguinal, iliohypogastic nerve block, rectus sheath block, intercostal nerve block are useful for somatic origin of pain.1 Celiac plexus and splanchnic nerve block are commonly performed for chronic abdominal pain arising from viscera.² Sympathetic innervation of the abdominal organs arises from preganglionic fibers of T5-T12. The nociceptive information from abdominal viscera are transmitted through celiac plexus via the splanchnic nerves. The sympathetic nerve transmission to celiac plexus is interrupted by splanchnic nerve block. It renders relief from pain that arises from the stomach, small bowel, large bowel to splenic flexure.² Splanchnic nerve can be blocked using local anesthetic and steroid or radiofrequency ablation of nerves can also be done. Radiofrequency ablation of splanchnic nerves provide analgesia for longer duration. It is usually done after positive diagnostic block with local anesthetic. However, splanchnic nerve block can be associated with transient hypotension, diarrhea, pneumothorax, chylothorax, inadvertent intrathecal, epidural or intravascular injection. A multicenter study was done by Dong D et al, in which 96 patients with unresectable pancreatic cancer with moderate to severe pain were randomized to splanchnic nerve block with chemical neurolysis or with normal saline. Pain relief with neurolysis was more compared with saline injection for the first 3 months.

In a study done by Garcea G et al, radiofrequency ablation of splanchnic nerves was done in 10 patients diagnosed with chronic pancreatitis. Pain significantly reduced following the procedure.

In a systematic review and meta-analysis done by Goyal S et al⁷, fourteen articles were studied which included chemical neurolysis as well as radiofrequency ablation of splanchnic nerves in patients diagnosed with upper abdominal malignancy. Ten articles demonstrated significant pain reduction at 1 week, 2 weeks, 4 weeks, 8 weeks, 12 weeks and also at 24 weeks.

Similarly, in a case series by Jyothi B et al¹¹, neurolytic splanchnic nerve block was done using 70% alcohol in patients with chronic pancreatitis. The baseline Visual Analogue Score (VAS) was 7.69 \pm 1.3, postprocedure VAS was 2.44 \pm 0.96 and VAS at 3 months followup was 1.56 \pm 1.15 respectively.

CONCLUSION

The cause of chronic postsurgical pain is usually misdiagnosed and is often under treated. Diagnostic nerve block is a helpful tool to differentiate the causes. Hence, splanchnic nerve block can be a useful interventional treatment for persistent abdominal pain following surgery.

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