

Transverse Abdominis Plane Block for Cancer Related Abdominal Pain: A New Modality in Horizon

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ABSTRACT

Primary or metastatic cancers involving the intra-abdominal organ systems frequently result in abdominal pain, of both abdominal visceral and somatic types. This pain can be extremely severe and distressing to patients, and very often requires the use of opioid-based medications for modification of pain to tolerable levels. Adjunctive therapies have also been described, including interventional procedures such as celiac plexus blockade. Both treatment modalities have obvious benefit, but also substantial risk. We present a case of significant and intractable abdominal cancer pain, and describe successful management of this pain with the relatively safe and simply performed ultrasound guided transverse abdominal plane (TAP) block.

Keywords: Intra-abdominal organ systems, Metastatic cancer, Ultrasound guided TAP block

CASE PRESENTATION

Our patient was a 53-year-old, male with a past medical history of genotype 1A hepatitis for quite long resulting in occurrence of cirrhosis, recently diagnosed Hepatocellular carcinoma s/p chemoembolisation, past IV and polysubstance abuse, and an unspecified clotting disorder including chronic thrombocytopenia. He used to take tramadol and morphine for chronic abdominal pain with recent frequent ED visits for management of breakthrough pain.

In early April 2016, the patient again visited to us, secondary to significantly worsening upper abdominal pain and nausea since last discharge. He stated that his pain was 10/10 on the numerical rating scale (NRS). As per the patient, his home pain medications were no longer helping. On admittance, his platelet count was found to be 49,000, with an INR of 1.34. Ultrasound showed dilated gall bladder, but his pain was attributed to the tumor lesion. Palliative care started the patient on PCA hydromorphone 0.3 mg/hour continuous dose with 0.4 mg demand dose, as well as IV steroid and antiemetic, and core measure enoxaparin. Escalating IV opioids failed to control the pain over the next several days, and the chronic pain service was consulted. After taking detailed history and examination, we came to the conclusion that the current opioid regimen was inadequate to control the patients pain and held enoxaparin in anticipation of celiac plexus block two days later. However, on the day of scheduled procedure, repeat complete blood count revealed platelet count-66,000. Celiac plexus block is an invasive maneuver, with close aortic proximity, or often transaortic approach [1]. Therefore, the patient was at high risk for significant bleeding. Instead, to alleviate any somatic component of the patient's pain, and in light of recent case reports [2, 3], the much less invasive TAP block was proposed, and the patient accepted the procedure and consented.

The procedure was performed the same day, in classically described fashion [4]. Patient was placed supine, prepped, and draped. Local superficial anesthesia was administered in the anterior axillary line, superior to the right iliac crest, and inferior to the costal margin in the region known as the lumbar triangle of Petit. The ultrasound transducer was placed in the same region, and the three muscle layers of the abdominal wall were identified. A 50 mm 22-gauge short bevelled block needle was introduced in-plane with the transducer, in an anteroposterior direction, and inserted to the fascial tissue plane between internal oblique and transversus abdominis, observed via injection of 2 mL of normal saline. A 20 mL block solution consisting of 19 mL 0.5% Bupivacaine and 40 mg Depomedrol was injected.

The next day, patient was interviewed, and stated that he felt the procedure worked quite well. His pain decreased from 8-10/10 to his chronic 6/10, which he stated was tolerable. He was able to begin eating and drinking without experiencing pain, had no further complaints, and was pleased with his outcome. He was transitioned to oral medications, and discharged on the same day. He followed-up with the pain clinic and told us that he had good pain relief for six weeks after the procedure. We repeated the same procedure about a month ago and his pain is still well-controlled.

DISCUSSION

Primary or metastatic cancers involving the intra-abdominal organ systems very frequently result in abdominal visceral pain, mediated chiefly by extrinsic spinal visceral afferent fibres. Convergence of these fibres with dorsal root somatic and intrinsic visceral fibres can lead to referred pain to both the abdominal wall and more distant sites [5]. Central signal convergence, in addition to mixed nociceptive and neuropathic stimuli, often manifests as diffuse and difficult to characterise abdominal pain [6]. Greater than 45-50% of abdominal cancer patients experience significant pain syndromes, and in fact more than half of these syndromes are characterised by mixed visceral and somatic pain. This pain can be extremely severe and distressing to patients, and very often requires the use of opioid-based medications for modification of pain to tolerable levels. Adjunctive therapies have also been described, including interventional procedures such as celiac plexus blockade. Both treatment modalities have obvious benefit, but also substantial risk. On top of the base level of cancer-related pain, breakthrough pain is a common occurrence, and often significant enough to cause hospitalisation [7].

In our patient with hepatic malignancy, chronic cirrhotic scarring and stretching of Glisson's capsule likely lead to classic epigastric and RUQ pain. However, he also experienced radiation from the inferior thorax around to the right flank, as well as right-sided abdominal wall pain, signifying a possible mixed pain syndrome.

Central to this treatment of chronic abdominal pain is the employment of an escalating ladder of medications aimed at reducing symptoms to a manageable level [8]. These opiate medication regimens are often very successful in managing cancer pain but the use comes with unwanted effects. With significant tolerance development, opiate medications may cease to control cancer pain. In addition, opiate sensitisation and altered receptor dynamics may actually

lead to worsened pain, with the development of hyperalgesia and allodynia in cancer patients [1]. Finally, patient with chronic abdominal pain may have worsening symptoms because of constipation and nausea.

With failure of escalating medication regimen, alternative adjuvant therapies may need to be employed. For upper abdominal cancer-related pain, celiac plexus block is often employed, targeting central and autonomic fibres responsible for visceral and neuropathic pain [9]. Celiac plexus block has been well described to be effective, however, in terms of nerve blockade interventions, it is a relatively invasive and risky procedure. The commonly employed posterior approaches lead needle invasion and manipulation of tissues in extremely close proximity to the diaphragmatic crura, the kidney, the celiac artery, and the upper abdominal aorta [8]. In our patient with thrombocytopenia of 66,000, history of an unspecified clotting disorder, and potential altered anatomy secondary to tumor made us feel that the peri or transaortic needle insertion of a celiac plexus block may put him at unreasonable risk of serious bleeding. Searching for alternative ways to treat his symptoms, we considered the possibility that TAP block, most commonly used for post-operative pain, may have some benefit. TAP blocks have historically been seen to result in blockade of somatic afferent pain signaling only. This is because TAP blocks functionally inhibit signaling from T7-S1 spinal nerve somatic afferents. These afferents transmit nociceptive pain signals from anterior abdominal wall muscular and cutaneous tissues, as well as partially innervate the parietal peritoneum. Most often it is utilised for post-operative pain associated with incisional trauma. In addition, it has been found to be opiate-sparing, and associated with lower incidence of post-operative hypotension and motor blockade than neuraxial anesthesia [4]. Based on clinical and neuroanatomical understanding, TAP blocks have long been considered to have no effect on pain of visceral origin [4]. However recent animal models have shown significant convergence of somatic and visceral afferent signals in the dorsal

horn. In one recent study, multiple patients presenting with either chronic pancreatitis or colitis experienced rapid, near total pain relief from TAP blockade [2] suggesting effectiveness in management of visceral pain. In our patient, standard opiate therapy had run its course, and classic interventions were not sensible. With TAP block, he experienced reduction of his abdominal pain to tolerable levels, that were amenable to home oral pain therapy. In addition, patient's significant anorexia and nausea resolved post-block, leading to discharge, the next day.

CONCLUSION

TAP blocks can potentially be effective in management of chronic abdominal cancer pain when more conservative medication options have failed, and more invasive procedures are not feasible.

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