

Ultrasound Guided Nerve Blocks for Anterior Cutaneous Nerve Entrapment Syndrome an Overlooked Cause of Chronic Abdominal Pain: A Case Series

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ABSTRACT

Entrapment abdominal neuropathy is not a common diagnosis in our context. Chronic Abdominal wall pain is often mistaken for gastritis, gynecological issue, thoracic spinal radiculopathy, rectus sheath hematoma, abdominal muscle injury or psychiatric disorder. Anterior cutaneous nerve entrapment syndrome is one of the frequent causes of abdominal wall pain occurring due to trapped thoracic intercostal nerves between abdominal muscles. History and bedside Carnett's sign can elicit the diagnosis. Injection of the local anesthetics with steroids in the junction between the rectus sheath and abdominal muscle under ultrasound guidance can provide sustained pain relief. We should consider Anterior cutaneous nerve entrapment syndrome as a differential diagnosis while evaluating the abdominal wall pain.

Keywords: ACENE; carnett's test; chronic abdominal pain; entrapment neuropathy; hydrodissection.

INTRODUCTION

Anterior cutaneous nerve entrapment (ACENE) syndrome is one of the causes of chronic abdominal wall pain.¹ Anterior branches of the intercostal nerve arising from thoracic 7-12 intercostal nerves are trapped in the anterior abdominal muscles causing pain. We overlooked ACENE syndrome as gastritis, gynecological issues, thoracic spinal radiculopathy, rectus sheath hematoma, abdominal muscle injury or even as a psychiatric disorder. We should consider the possible diagnosis of the ACENE syndrome in the context of chronic abdominal pain detailed history, the history of trauma, increase of pain with physical activities and with positive Carnett's sign suggests the diagnosis of the ACENE syndrome.² Ultrasound-guided hydro dissection with an injection of local anesthetics in combination with steroids will release the entrapped nerve alleviating the pain.³ We report three cases of ACENEs managed with ultrasound-guided block technique.

CASE 1

A 38-years-old lady had complained of chronic abdominal pain for 3 years. She had no significant medical and surgical history. She was taking pantoprazole and tramadol for gastritis and as an analgesic, respectively. She described her pain as dull and burning. She localized

the pain between the umbilicus and epigastrium on the left side. The pain aggravated while standing and lifting weight. She had not been able to sleep lying on her left side. The pain was gradually increasing in intensity and was not radiating in nature. The pain in the numerical rating scale (NRS) was 5 out of 10.

Her routine laboratory investigations were within normal limits. Ultrasound of the abdomen and the upper gastrointestinal endoscopy were normal. She could localize the lateral end of the rectus muscle at the Thoracic 9 dermatome level as the point of the pain. Carnett's test was positive. During Carnett's Test, the numerical rating scale (NRS) increased to 7/10. These findings suggested the diagnosis of ACENE syndrome.

CASE 2

A 42- years-old lady had complained of pain in right lower abdomen for 8 yrs. She had undergone total abdominal hysterectomy with unilateral salpingo-oophorectomy for bulky uterus and symptomatic adenomyosis 3 years back. The pain prevailed for the last 2 years after surgery and the intensity of the pain gradually increased. The pain in NRS was 6 to 7 during rest. The patient revisited her gynecologist, and she was referred to the surgeon to rule out the other abdominal pathology. Computed

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tomography (CT) of the abdomen was apparently normal except for reactive lymph nodes. Then, the attending surgeon referred her to the gastroenterologist. Upper gastrointestinal endoscopy was within normal limits. The gastroenterologist then referred her to our pain clinic for further management. On examination, she could point the pain on the right lumbar fossa with fingers. The pain in a numerical rating scale (NRS) was 9 while we applied slight pressure on the tender site. This suggested the diagnosis of ACENE syndrome.

CASE 3

A 37-years- lady presented in our pain clinics with complaints of pain in the right subcostal region for 2 years. She had undergone consultations with a gynecologist, gastroenterologist multiple times. Routine laboratory investigations and ultrasound and CT of abdomen and pelvis were within normal limits. However, the pain intensity was agonizing, and her pain in NRS was 7. She was referred to a psychiatrist. The psychiatrist made the diagnosis of the somatoform disorder and prescribed antipsychotic drugs. On examination, we could locate the tender point. The Carnett's sign was positive that was indicative of the ACENE syndrome.

Plane Block with local Anesthetic and steroid:

All patients were explained regarding pathophysiology and treatment plan. Informed consent was taken. The procedure was performed under strict aseptic precautions. A probe and connecting cable were sterilized with 5% providing iodine and 90% alcohol. A linear probe (3-5MHz, Mindray DC 80) was used.



Fig 1. Abdominal scan showing Rectus Abdominis mule (RM) and Transversus Abdominis muscle (TA)

Rectus sheath and transversus abdominal muscles were visualized. A spinal needle (26 G B. Braun) was used

to reach the lateral border of the rectus abdominis muscle in an In-plane approach. A mixture of 40 mg methylprednisolone (10 ml per segment involved) with 0.125% bupivacaine was injected. A further craniocaudal scan was done to visualize drug spread.

NRS was reduced to 1-2 immediately after the procedure in all three cases. We followed the patients on the telephone for 1 month and 6 months and the NRS was maintained at 1-2. (figure1,2,3)

1 case re-injection with triamcinolone 40 mg was done at 3 months.

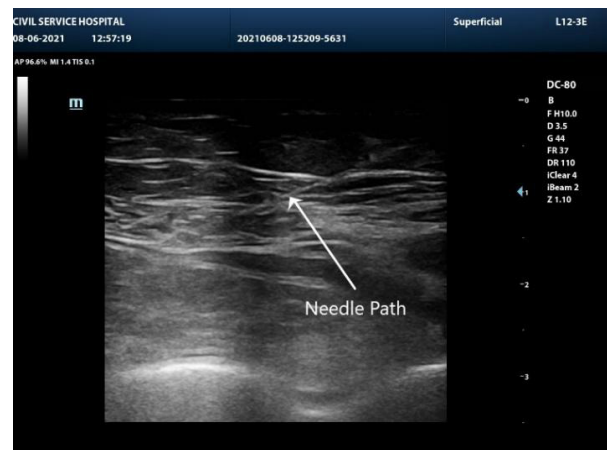


Fig 2. Showing needle through rectus abdominis muscle



Fig 3. Drug spread Local Anesthetics (LA)

Fig 1 Ultrasound image showing relevant anatomy; RM: rectus muscle; TA: transversus abdominis muscle. Fig ultrasound image showing needle path for the block. Fig 3 ultrasound image showing local anesthesia depositions after hydrodissection; LA: local anesthesia

DISCUSSION

In all the cases, we observed our patients were young females with chronic abdominal pain. They suffered for a long time resulting in many visits to the doctors, hospitals, and alternative medicine practitioners.

They underwent multiple laboratory and radiological investigations. We reliably suspected the diagnosis of ACNE syndrome evaluating the clinical presentation and Carnett's test.² Carnett's test is a clinical test to differentiate the intra abdominal mass from abdominal wall mass. The patient is asked to tense abdominal muscle by raising the leg and lifting the head or shoulder. If the pain is constant or increased, the test was considered positive. The positive tests suggest pathology in the abdominal wall. We perform ultrasound-guided blocks to alleviate the pain that also favors the diagnosis of ACENEs syndrome.

The cause of ACENE syndrome is unclear. Entrapment of the anterior cutaneous branches of the thoracoabdominal and subcostal (T7-T11 and T12) in the fibrous tissue of the rectus muscle results in chronic abdominal pain. Change in the direction of the nerve, during entry through neurovascular channels in the rectus sheath, makes them vulnerable to entrapment. Pregnancy, previous abdominal surgery, and trauma can trigger the syndrome.⁷

The management of ACENE syndrome is challenging.⁴ The reasons for the diagnostic dilemma are many. Transient response of pain to proton pump inhibitors or some form of intervention makes the syndrome diagnosis even delayed.^{5,6} There are no accepted clinical practice guidelines, and the patient referred to pain physicians is late. Failure of judgment on part of the clinical practitioner when the patient presents early and lack of information about the disease process both with the treating physician and the patients are some of the factors that cause a delay in the diagnosis of the syndrome. Cohorts of case report evidence also confirm the delayed presenting nature of the disease among the practicing physicians.^{7,10} There is also difficulty in visualizing the entrapped nerves in ultrasound, CT and MRI.

Ultrasound-guided nerve blocks can provide immediate and substantial relief pain associated with ACENE syndrome. Anesthesiologists and the pain physician, who is an expert in USG guided pain management procedures, can perform the blocks. The procedure is relatively safe as the fascial plane is superficial, the injection site is devoid of major vascular structure, and the chances of perforation of the peritoneum are less likely. The

procedure aims to deposit the local anesthetic agents and steroids on the plane of the transversus abdominis muscle and rectus sheath. Pain is alleviated once the compressed nerve is relieved with the hydrodissection. Rapid alleviation of pain confirmed with fall in numerical pain scores to 1-2 in all three cases also confirms the retrospective diagnosis of ACENEs syndrome. Steroids will help with pain relief for a long duration and prevent the development of chronic pain.^{8,9}

CONCLUSIONS

The use of ultrasound-guided nerve block technique can improve management of ACENE syndrome. Minimal invasive procedures will also decrease the financial burdens to patients avoiding unnecessary investigations.

CONFLICT OF INTEREST

None

Consent: JNHRC Case Report Consent Form was signed by the patient and the original article is attached with the patient's chart.

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