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Anterior Cutaneous Nerve Entrapment Syndrome in a 51-Year-Old Woman With Advanced Colon Cancer, Successfully Treated With Repeated Ultrasound-Guided Rectus Sheath Blocks: A Case Report

Authors' Contribution:

Study Design A

Data Collection B

Statistical Analysis C

Data Interpretation D

Manuscript Preparation E

Literature Search F

Funds Collection G

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Patient: Female, 51-year-old

Final Diagnosis: Anterior cutaneous nerve entrapment syndrome

Symptoms: Abdominal pain

Clinical Procedure: —

Specialty: Palliative Medicine

Objective: Challenging differential diagnosis

Background: Anterior cutaneous nerve entrapment syndrome is an underrecognized cause of abdominal wall pain and may be overlooked, particularly in patients with advanced cancer, in whom abdominal pain is often attributed to malignancy-related causes. Failure to identify coexisting non-cancer-related pain mechanisms can result in inadequate pain control and functional decline.

Case Report: A 51-year-old woman with advanced sigmoid colon cancer and peritoneal metastasis presented with severe movement-related abdominal pain that was refractory to high-dose opioid therapy. Although tumor lesions were present near the umbilicus, she reported minimal pain at rest, with marked exacerbation during sitting and ambulation. Physical examination revealed multiple localized tender points along the lateral borders of the rectus abdominis muscle and a positive Carnett's sign, suggesting abdominal wall pain. Based on these findings, anterior cutaneous nerve entrapment syndrome was suspected. Ultrasound-guided bilateral rectus sheath blocks were performed at the tender points, resulting in immediate pain relief. Although the initial analgesic effect was transient, repeated blocks led to sustained pain reduction beyond the expected duration of local anesthetic action, enabling recovery of mobility and activities of daily living.

Conclusions: This case shows that anterior cutaneous nerve entrapment syndrome can coexist with cancer-related pathology and is a treatable cause of refractory abdominal pain in patients with advanced cancer. Careful assessment of pain characteristics and physical examination, even in the presence of tumor lesions at the pain site, can facilitate recognition and treatment of non-cancer-related pain and improve functional outcomes and quality of life in palliative care settings.

Keywords: Nerve Compression Syndromes • Neuralgia • Palliative Care • Trigger Points

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Introduction

Pain is one of the most prevalent and distressing symptoms in patients with advanced cancer, and its management is a fundamental component of palliative care. Approximately three-fourths of patients with cancer and chronic pain have nociceptive (somatic or visceral) or neuropathic syndromes that are direct effects of the neoplasm and are usually treated with opioid-based pharmacological therapy [1]. Although opioids are effective for many patients, some have persistent pain despite high-dose opioid treatment. In such cases, clinicians should consider alternative or coexisting causes of pain that are not directly related to tumor progression [2,3].

Anterior cutaneous nerve entrapment syndrome (ACNES) is a frequently underrecognized cause of chronic abdominal wall pain resulting from entrapment of the anterior cutaneous branches of the thoracoabdominal nerves as they pass through the abdominal wall. Because ACNES pain ranges from mild to severe and is often sharp or burning, ACNES is frequently misdiagnosed as visceral pain. ACNES can occur in patients with advanced cancer, and its pain can mimic cancer-related abdominal pain, underscoring the importance of including ACNES in the differential diagnosis in this population. Here, we report the case of a 51-year-old woman with advanced sigmoid colon cancer who presented with severe movement-related abdominal pain, which was most likely initially attributed to tumor progression or peritoneal dissemination. A positive Carnett's sign and the limited efficacy of high-dose opioid therapy suggested that ACNES was a source of the pain. Repeated ultrasound-guided rectus sheath blocks resulted in substantial and sustained pain relief. This case highlights the importance of considering ACNES in the differential diagnosis of abdominal pain, even in patients being treated for advanced cancer.

Case Report

A 51-year-old woman with a history of sigmoid colon cancer presented with severe abdominal pain when sitting up from a supine position or while walking. She had previously undergone surgical resection for sigmoid colon cancer and subsequently developed local recurrence in the sacral region and peritoneal metastasis around the umbilicus (Figure 1). Given the disease progression, she had been receiving best supportive care. She was hospitalized for subileus and abdominal pain due to cancerous peritonitis. After admission, the subileus improved with fasting and placement of an ileus tube, but her abdominal pain remained poorly controlled despite intensive pharmacological pain management. Her analgesic regimen included nonsteroidal anti-inflammatory drugs, mirogabalin at a dose of 30 mg/day, and oral methadone at 60 mg/day. In addition, intravenous patient-controlled analgesia with morphine was

administered as rescue medication, with a maximum dose of 700 mg/day (87.5 mg per bolus).

On initial examination after referral to our department, the patient reported only mild abdominal pain while resting in the supine position. However, within a few minutes of assuming a sitting position or shortly after initiating ambulation, she experienced sudden, severe, stabbing pain localized to the umbilical region. This movement-related pain significantly limited her ability to sit upright, walk, and participate in rehabilitation. Physical examination revealed multiple discrete tender points along the lateral borders of the rectus abdominis muscle on both sides of the umbilicus (Figure 2). Palpation of these points reproduced her characteristic pain. Carnett's sign was positive, as the pain intensified when the abdominal muscles were tensed. Although the tumor was also present near the umbilicus because of peritoneal metastasis, the distribution and nature of the pain suggested abdominal wall pain rather than visceral or cancer-related pain. Based on these findings, ACNES was suspected.

Ultrasound-guided bilateral rectus sheath blocks targeting the identified tender points were performed to confirm the diagnosis and relieve pain (Figure 3). Immediately after a total of 50 mL of 0.25% ropivacaine was injected, the patient experienced complete resolution of pain and was able to maintain a sitting position and ambulate during rehabilitation. Eight hours after the local anesthesia wore off, the analgesic effect of the first block disappeared and the abdominal pain returned. Repeated administration of rectus sheath blocks at the same sites gradually increased the duration of pain relief. The effect of the fifth block lasted for more than 24 hours. Thereafter, these procedures were repeated upon pain flares when requested by the patient. Because the pain had not returned for over 2 months after the ninth block, nerve block treatment was discontinued (Table 1). A total of 9 ultrasound-guided rectus sheath blocks were administered, without any procedure-related complications (Figure 4). Ultimately, she achieved sufficient pain control to perform activities of daily living independently. Multiple analgesics were gradually tapered to oral oxycodone at a dose of 40 mg/day over 2 months, and she was discharged from the hospital.

Discussion

ACNES is caused by entrapment of the anterior cutaneous branches of the thoracoabdominal nerves as they penetrate the abdominal wall fascia, typically near the lateral border of the rectus abdominis muscle. Mechanical irritation of these nerves can cause localized neuropathic pain and hypersensitivity [4,5]. Clinically, ACNES is characterized by a well-localized tender point, pain exacerbated by contraction of the abdominal muscles or changes in posture, and a positive Carnett's sign [6,7]. Because laboratory and imaging findings are usually unremarkable, the

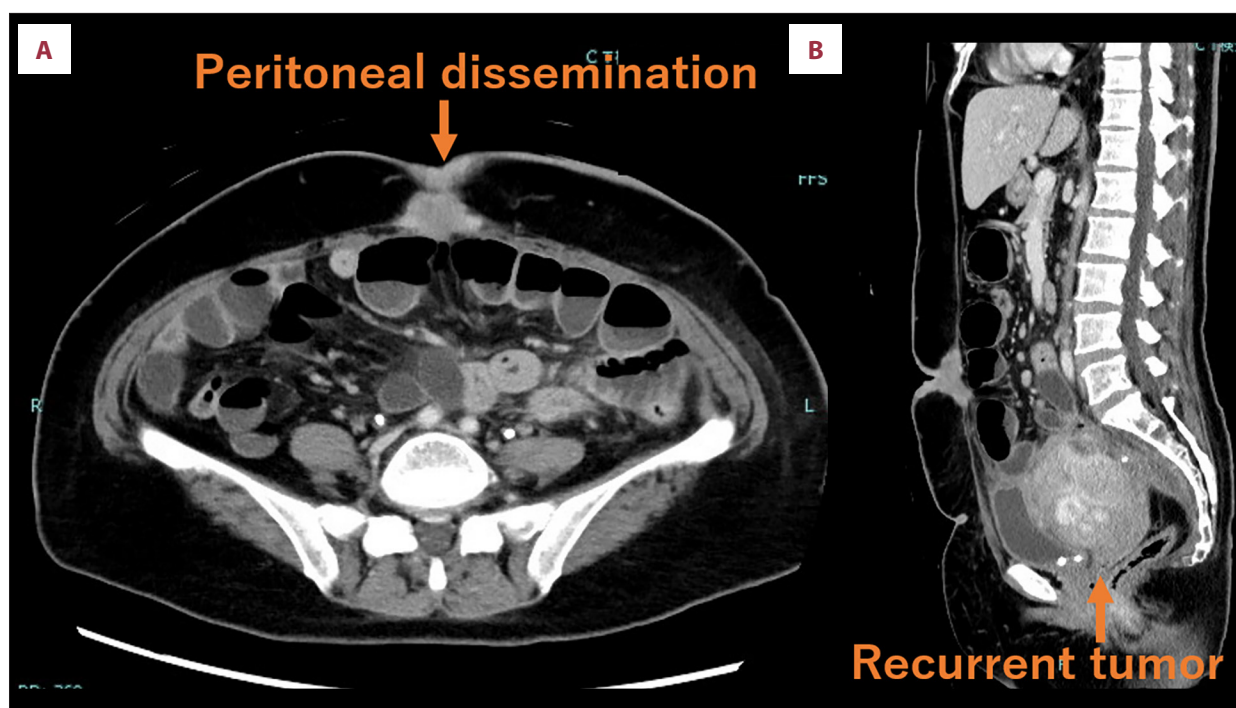


Figure 1. Transverse (A) and sagittal (B) computed tomography images of the abdomen after surgical resection for sigmoid colon cancer, demonstrating peritoneal metastasis around the umbilicus (A) and local recurrence in the sacral region (B).

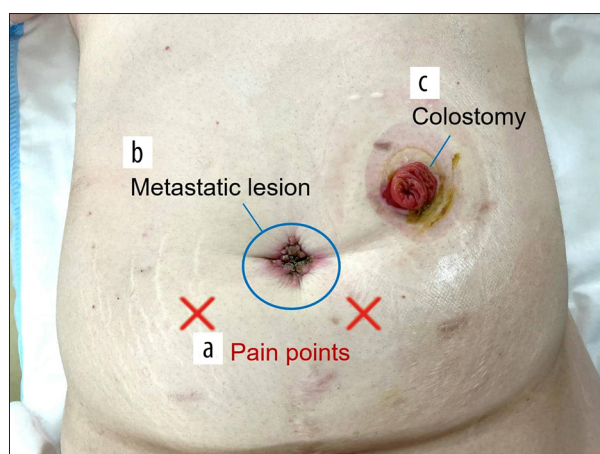


Figure 2. Abdominal inspection findings. a) Pain was localized along the lateral border of the rectus abdominis muscle on both sides of the lower abdomen. The pain was described as stabbing and was exacerbated by movement, particularly during sitting or tensing of the abdominal muscles. b) Peritoneal metastatic lesion around the umbilicus. c) Colostomy on the left side of the abdomen.

diagnosis relies primarily on clinical examination and is therefore frequently overlooked. Previous studies have reported that abdominal wall pain accounts for a substantial proportion of cases of persistent abdominal pain referred to specialists and is often misdiagnosed as visceral pain [7,8].

Local anesthetic injection at the site of maximal tenderness is widely used in ACNES for diagnostic and therapeutic purposes [9]. Previous randomized controlled trials have demonstrated that trigger point injections with local anesthetics can provide significant pain relief in patients with ACNES [9]. Even if the analgesic effect of a single injection is transient, repeated injections have been reported to result in sustained symptom improvement in some patients [10]. In the present case, while the initial block provided only temporary relief, repeated ultrasound-guided rectus sheath blocks led to gradual and sustained improvement in pain. Although the exact mechanism of this prolonged benefit is not fully understood, repeated blocks may reduce neurogenic inflammation, interrupt pain sensitization, and desensitize the entrapped nerve through repeated blockade [11].

Although there is no evidence-based consensus on the optimal time interval for repetitive nerve blocks in patients with ACNES, several case reports have indicated that such nerve blocks were successfully performed at intervals ranging from 1 day to 2 months, depending on the recurrence of symptoms [12-16]. Our patient was hospitalized because of severe pain, which allowed us to address the recurrence of pain promptly and note her response, enabling us to flexibly adjust the time interval between blocks.

Notably, ACNES occurred in our patient, who was receiving high-dose opioids, including methadone and intravenous

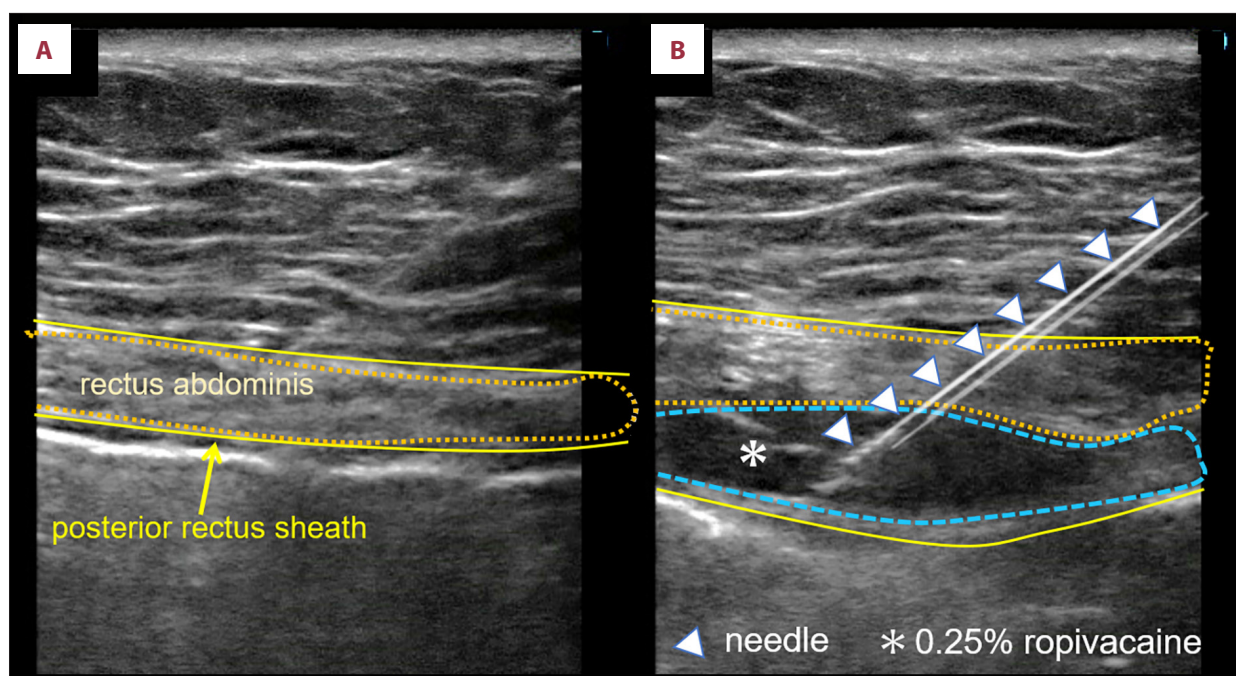


Figure 3. Ultrasound-guided rectus sheath blocks at the points of tenderness. (A) Ultrasound image of the rectus abdominis and posterior rectus sheath. (B) Hydrodissection was performed between the rectus abdominis muscle and the posterior rectus sheath using an in-plane approach from lateral to medial for the rectus sheath blocks.

Table 1. Analgesia duration during repeated rectus sheath blocks and rescue with intravenous morphine administration.

Date	Rectus sheath block No.	Analgesic duration	Rescue IV morphine (mg/day)
Initial consultation			700
Day 1	No. 1	8 hours	260
Day 2	No. 2	8 hours	175
Day 3	No. 3	12 hours	0
Day 6	No. 4	12 hours	87.5
Day 7	No. 5	Over 24 hours	87.5
Day 8	No. 6	Over 24 hours	35.0
Day 9	No. 7	Over 24 hours	0
Day 10	No. 8	Over 5 days	0
Day 15	No. 9	Over 2 months	0

Day 1 indicates the day of the first rectus sheath block administration. Block No. indicates the sequence of the rectus sheath blocks. The analgesic duration refers to the period during which effective pain relief was maintained after administration of each of the 9 blocks. Rescue IV morphine refers to the total daily dose of intravenous morphine administered for breakthrough pain.

morphine, for advanced cancer pain. Despite the escalation of systemic analgesics, her movement-related abdominal pain remained poorly controlled until a local anesthetic was administered. This observation highlights the limitations of systemic pharmacological therapy and the importance of targeted interventional approaches when pain arises from focal peripheral nerve entrapment.

Importantly, the presence of tumor lesions near the painful area does not necessarily indicate that the pain is directly related to malignancy. Abdominal wall pain, such as ACNES, can coexist with cancer-related pain. Failure to recognize this possibility can lead to unnecessary diagnostic investigations and escalation of systemic analgesic therapy. Careful physical examination, including assessment for Carnett's sign and localized tenderness, is crucial in the evaluation of abdominal pain.

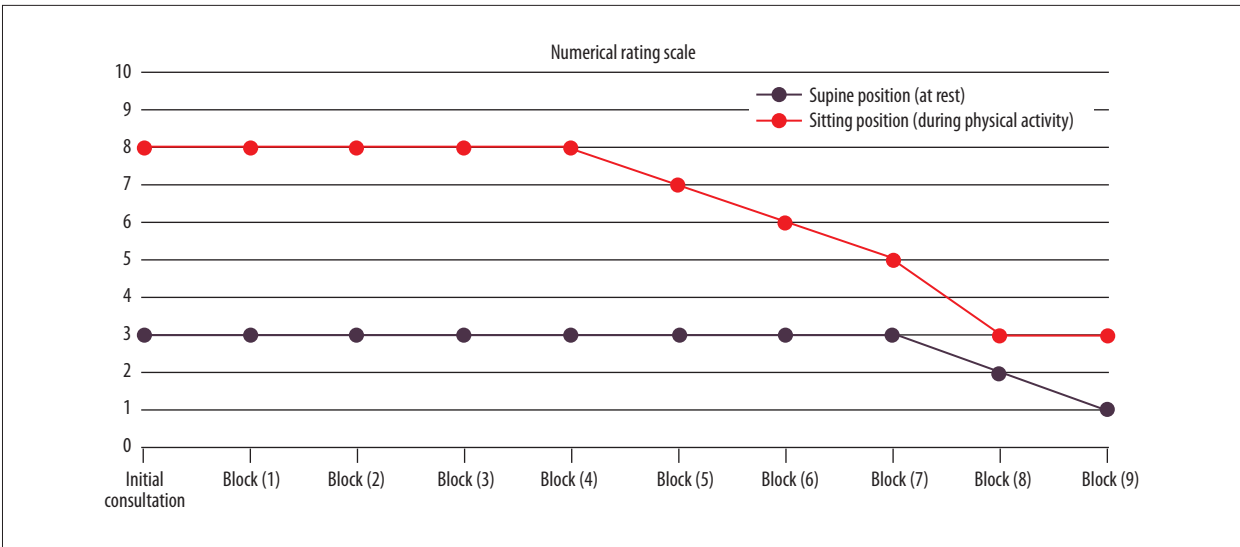


Figure 4. Analgesic effects of repeated rectus sheath blocks. From the first to the fifth injections, pain relief was observed immediately after the procedure but was temporary. Pain recurred to baseline levels as the local anesthetic effect wore off. Between the sixth and ninth injections, pain relief was maintained for at least 24 hours after the blocks.

Conclusions

This case demonstrates that ACNES should be included in the differential diagnosis of abdominal pain, even in patients with advanced cancer. Recognition of characteristic clinical findings, together with the use of diagnostic local anesthetic blocks, can support accurate diagnosis and effective treatment, and can improve function and quality of life.

Department and Institution Where Work Was Done

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Patient Consent

Obtained.

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