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An Unusual Presentation of Intercostal Neuralgia

ROBERT F. HAYNSWORTH, JR., M.D.,* CARL E. NOE, M.D.*

Patients with abdominal pain are frequently referred for diagnostic blocks to differentiate abdominal wall pain (somatic) *versus* visceral pain. Visceral pain, suggested by cramps, weight loss, and nausea, usually responds to blockade of the autonomic system, and somatic pain, characterized by a sharp piercing pain with easily localized trigger areas, usually responds to blockade of intercostal nerves. This unusual case illustrates a patient presenting with visceral pain complaints who responded to intercostal block and subsequent radiofrequency denervation.

CASE REPORT

A 58-yr-old woman with no previous abdominal symptoms or surgery presented with a 4-month history of right upper quadrant pain. The pain began under the costal margin as a dull ache and was consistently worsened by eating. During severe episodes, there would be radiation to the spine. Nausea and a 3.6-kg weight loss over 4 months prompted a work-up to exclude benign and malignant conditions. A comprehensive work-up failed to confirm a diagnosis. Laparoscopy was performed that revealed incidental scarring over the liver on the right side.

Because of continued deterioration, the patient was hospitalized and required meperidine every 3 h for pain control. Consultation from the pain service was obtained, and physical examination revealed tenderness in the right subcostal area with no tenderness in any particular intercostal dermatome. An SCL 90 (symptom check list, 90 questions) psychological screen was administered and found to be normal in all scales. Because of radiation of pain to the spine, intercostal nerve blocks were performed at T10, T11, and T12 on the right using 0.25% bupivacaine. The T11 needle placement reproduced the patient's pain as did the injection of bupivacaine. The pain resolved, allowing painless eating during the first two meals that day. Pain recurred approximately 8 h after the block. The following day, a right T11 intercostal nerve block was repeated that produced the same quality and duration of analgesia.

A right T11 partial rhizotomy was subsequently performed using a Radionics (Burlington, MA) radiofrequency lesion generator and a 10-cm Sluijter-Metha needle. This was accomplished by inserting the needle 1 cm lateral to the edge of the vertebral body at T11 under anterior–posterior (AP) fluoroscopic visualization and advancing under the transverse process toward the T11 neuroforamen. Final manipulation of the needle was done using lateral fluoroscopy while stimulating at 75 Hz and 0.1 V. When the pain was reproduced in the T11 nerve distribution, AP fluoroscopy confirmed that the needle tip was just medial to the lateral border of the vertebral body. Motor stimulation at 5 Hz and 4 V produced muscle contraction only in the T11 distribution. One milliliter of 2% lidocaine was injected before inducing a lesion at 80° C for 150 s.

The patient's pain resolved immediately after the partial rhizotomy, and she remained pain-free at a 4-month follow-up visit. The nausea resolved, and she had gained 2.3 kg by the 8-month follow-up. She has numbness in the T11 dermatome, but she has had no neuritis following the rhizotomy.

DISCUSSION

Intercostal neuralgia as a cause of abdominal pain was first described by Carnett in 1926.[2] Since then, there have been numerous reports of abdominal pain without intraabdominal pathology that have been attributed to nerve involvement or entrapment.[3–6] In all of these reports, abdominal wall pain was easily identifiable by "trigger point" tenderness usually occurring close to a previous surgical scar or at the lateral edge of the rectus muscle where the intercostal nerves make a sharp turn into the muscle. Pain was usually made worse with tensing of the abdominal musculature, and a burning sensation could be felt radiating toward the spine.[7] This case was unusual in that the presentation was nausea and weight loss with nonspecific right upper quadrant pain that became intense while eating. At no time did this patient show localized tenderness characteristic of nerve entrapment or worsening of pain with muscular contraction. This patient did show incidental scarring over the liver at laparoscopy, possibly leading to parietal peritoneal irritation and subsequent abdominal wall pain that resolved with intercostal blockade and rhizotomy.

Treatment of abdominal pain secondary to cutaneous nerve involvement or entrapment has included repeated trigger point injections with and without steroids, phenol injections into the trigger areas, intercostal blocks, radiofrequency lesions of the trigger areas, and surgical decompression and neurectomy.[3,8–10] This case demonstrates that partial rhizotomy may be a very useful technique for long-term pain control in cases where the abdominal pain is found to involve a specific intercostal nerve.

In conclusion, it is suggested that diagnostic intercostal nerve blocks be considered in cases of abdominal pain with unclear etiology, even if signs and symptoms of nerve root entrapment or involvement are not easily identifiable.

* Associate Attending.

Received from the Department of Anesthesiology, Baylor University Medical Center, 3707 Gaston Avenue, Suite 712, Dallas, Texas 75246. Accepted for publication May 2, 1990. This work was carried out at Baylor University Medical Center, Dallas, Texas.

Address reprint requests to Dr. Noe: 3707 Gaston Avenue, Suite 712, Dallas, Texas 75246.

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REFERENCES

1. Derogatis LR, Rickels K, Rock AF: The SCL 90 and the MMPI: A step in the validation of a new self report scale. Br J Psychiatry 128:280–289, 1976.

2. Carnett JB: Intercostal neuralgia as a cause of abdominal pain and tenderness. Surg Gynecol Obstet 42:625, 1926
3. Ashby EC: Abdominal pain of spinal origin. Ann R Coll Surg Engl 59:242, 1977
4. Hall PN, Lee APB: Rectus nerve entrapment causing abdominal pain. Br J Surg 75:917, 1988
5. Doouss TW, Boas RA: The abdominal cutaneous nerve entrapment syndrome. N Z Med J 81:473–475, 1975
6. Applegate WV: Abdominal cutaneous nerve entrapment syndrome. Surgery 71:118–124, 1972
7. Tung AS, Tenicela R, Gioranetti J: Rectus abdominis nerve entrapment syndrome. JAMA 240:738–739, 1978
8. Gallergos NC, Hobsley M: Recognition and treatment of abdominal wall pain. J R Soc Med 82:344, 1989
9. Mehta M, Ranger I: Persistent abdominal pain. Anaesthesia 26: 330, 1971
10. Ghia JN, Duncan GS, Scott DS, Gregg JM: Therapeutic nerve block for chronic pain. Am Fam Physician 20:74, 1979

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Acute Upper Airway Obstruction Due to Arterial Puncture during Percutaneous Central Venous Cannulation of the Subclavian Vein

ANTHONY M. O'LEARY, M.B.B.S., M.R.C.G.P., D.C.H., D.R.C.O.G.*

This case report documents the clinical course following attempted, percutaneous, infraclavicular central venous catheterization of the subclavian vein leading to rapid, extensive arterial hemorrhage and total upper airway obstruction necessitating emergency tracheal intubation.

CASE REPORT

An 85-yr-old white woman (height, 166 cm; weight, 75 kg) was admitted to the coronary care unit with a history of episodes of loss of consciousness and collapse. Examination revealed bradycardia of 30–40 beats per min and signs of left ventricular failure. An ECG confirmed complete heart block, and a chest x-ray showed pulmonary edema.

A diagnosis of Stokes-Adams attack was confirmed, and a decision was made to institute temporary transvenous pacing. Hemoglobin at this time was 9.9 g/dl, and prothrombin time was 16 s (control, 14 s), which was considered evidence that there was no significant clotting abnormality.

A 14-G needle (ID, 1.6 mm; OD, 1.9 mm) was inserted one finger breadth below the midpoint of the clavicle. The needle tip was advanced along the inferior border of the clavicle in the direction of the sternal notch. At all times during advancement of the needle, gentle negative pressure was maintained by slightly withdrawing the plunger to identify entry into a vessel. The procedure was difficult, and after four separate attempts using different infraclavicular entry sites and different depth of needle insertion and direction of needle, the needle entered a vessel; the syringe was removed from the needle hub, and a jet of pulsatile arterial blood was witnessed. The needle was removed, and local pressure was applied for 2 or 3 min. At this point, the suprasternal notch suddenly disappeared, and the soft tissues of the neck rapidly became swollen. This occurred 20 min into the procedure and 5 min after documented arterial puncture.

Intense cyanosis was noted, and there was a marked degree of neck swelling that was very tense and hard. Assisted manual ventilation was attempted with no success, and the patient lost consciousness. At this point 10 min after arterial puncture, total upper airway obstruction supervened, and a decision was made to intubate the trachea. Initially, laryngoscopy revealed a grade 4 view (neither cords nor epiglottis visible), and the soft tissues were of such a hard consistency that they resisted attempts to improve the view with the laryngoscope blade. A grade 3 view (epiglottis visible, cords not visible) was soon achieved, and the trachea was intubated with a standard, cuffed, oral endotracheal tube that passed easily through the vocal cords. Attempts to advance the tube further, however, were associated with considerable resistance, giving the impression that the trachea was either collapsed or angled acutely below the level of the cords. A satisfactory position was eventually obtained, and the lungs were ventilated with ease, after which cyanosis resolved and consciousness returned.

Subsequently, the patient was admitted to the intensive care unit (ICU), and her lungs were mechanically ventilated overnight. Cardiac pacing was achieved after an extremely difficult insertion of a left internal jugular central venous catheter that was due to the marked swelling of the neck. Ten hours later, the patient's hemoglobin concentration had decreased from 9.9–7.7 g/dl, and the results of clotting studies were normal.

Tracheal extubation was achieved uneventfully 4 days after admission. There was no electrocardiographic or enzyme evidence of acute myocardial infarction.

During the patient's first day in the ICU, a number of procedures were performed to accurately document the nature of this complication. A lateral radiograph of the neck (fig. 1) illustrated marked widening of the retropharyngeal space consistent with retropharyngeal hematoma. A chest x-ray demonstrated the absence of significant hemothorax or pneumothorax and also showed tracheal deviation to the left. Computerized axial tomographic (CAT) scans through sections at the level of the sixth and seventh cervical vertebrae, respectively, illustrated a right-sided mass without well-defined boundaries. The first CAT scan (fig. 2) showed the trachea to be relatively central, but a further scan (fig. 3) showed the trachea to be deviated toward the left.

DISCUSSION

Percutaneous central venous catheterization is associated with many potential complications that have been well-documented in the literature. There is little doubt that in this case an artery was lacerated and acute hem-

* Registrar in Anaesthesia.

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Address reprint requests to Dr. O'Leary: Registrar in Anaesthesia, 1 Parkers Fields, Quorn, Loughborough, Leicestershire, LE12 8EJ, England.

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