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Treatment of Benign Chronic Abdominal Pain with Neurolytic Celiac Plexus Block

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Chronic abdominal pain is difficult to evaluate and manage. The etiology of chronic pain is complex and involves social, behavioral, psychological, and organic factors. Patients with chronic abdominal pain may have several medical problems, take many medications, and have a history of multiple operations. They often have many evaluations without determination of a diagnosis. The prognosis for improvement of chronic, unexplained abdominal pain is poor. Talley *et al.* found that 70% of patients with chronic dyspepsia had no improvement over an average of 17 months.[1] Sloth and Jorgensen found that 81% of patients with chronic abdominal pain still had pain after 5–7 yr.[2] The options for these patients include long-term medical treatment, behavioral and psychological therapy, and surgery.

The advantages of the celiac plexus block for selected cases are its rapid results and few side effects. We report a case of a woman who has had longstanding relief of benign chronic abdominal pain after a series of celiac plexus blocks. We discuss why we chose this aggressive procedure for a patient who was not terminally ill.

CASE REPORT

A 27-yr-old woman developed burning epigastric pain in 1984. The pain occurred after meals and exercise and was accompanied by severe nausea. It was not relieved by cimetidine or antacids. An extensive work-up, including upper and lower gastrointestinal series, abdominal ultrasound, and esophagogastroendoscopy found no abnormalities except mild gastritis. In 1987, angiography showed that she had nearly complete occlusion of the proximal celiac artery, and celiac axis compression syndrome was diagnosed. Surgical decompression of the artery in May 1987 relieved her symptoms completely.

The patient did well until January 1988, when the pain and nausea recurred. She lost 3.6 kg because of poor appetite and was unable to work or exercise. A trial of imipramine up to 50 mg per day was unsuccessful because of side effects. Dietary modification was ineffective. Cimetidine, Phenergan 50 mg per day, and Vicodin 2–3 tablets per day partially relieved the pain and nausea, but the patient suffered from intolerable drowsiness. She refused other opioids because of excess sedation. She began psychological and behavioral therapy for chronic pain and returned for follow-up with her vascular surgeon at the University of California, San Francisco (UCSF). He referred her to the UCSF Pain Management Center for evaluation in August 1988 after a repeat angiogram showed a widely patent celiac artery.

The patient's past medical history was unremarkable. She weighed 54.5 kg, and her abdomen was not tender and its upper midline scar well-healed. There was no epigastric bruit. She complained of severe epigastric burning pain.

We did not know the etiology of the chronic abdominal pain. Celiac axis compression syndrome seemed to be responsible when the decompression operation relieved her pain, but the pain returned with the celiac artery still patent. An extensive work-up eliminated other causes of abdominal pain, such as cholecystitis or peptic ulcer disease. Irritable bowel syndrome was not considered because the patient had normal bowel function.

A diagnosis of visceral pain was made because of its dull, burning, poorly localized quality, and we recommended a diagnostic celiac plexus block. A neurolytic block was planned if the diagnostic block relieved the pain. More conservative therapy was not chosen because the woman had been incapacitated with pain for 4 yr, excluding the 6 months after her operation, and alterations in medication regime and diet and psychological therapy had not been successful. The neurolytic block offered the chance of immediate relief and improvement in lifestyle. As discussed later, we believed the benefits of the neurolytic celiac plexus block outweighed the risks.

Using a single-needle transaortic technique with the patient prone, a 20-G 6-inch needle was inserted through the skin approximately 6 cm to the left of the spinous process of L1 under the twelfth rib and passed through the aorta. An injection of 20 ml 2% lidocaine was made, and this relieved the pain. The next day, using the same technique, a neurolytic celiac plexus block with computed tomography (CT) guidance was performed. The CT scan showed preaortic spread of injected contrast. Fifteen milliliters 0.5% bupivacaine and then 20 ml 6% phenol were injected. Pain and nausea worsened but then subsided completely in a few days. The patient remained pain-free until a smaller area of epigastric tenderness returned 3 months later.

The patient underwent three additional neurolytic celiac plexus blocks over the next eight months for progressively smaller residual areas of pain. Since the last celiac plexus block in August 1989, she has been completely free of pain and nausea. Her appetite has improved, and she has regained her lost weight. Her energy also has returned, and she is now able to work, play tennis, ski, and exercise at her previous level. She is no longer taking the cimetidine, Phenergan, or Vicodin. The latest follow-up was 28 months after the initial celiac plexus block and 16 months after the last block.

DISCUSSION

The neurolytic celiac plexus block is an effective tool for treating pain from abdominal malignancies, and particularly pancreatic carcinoma. It relieves pain in 70–90% of cancer patients, often for the duration of the patient's

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life.[3-5] Pain relief has been reported in 70% of patients with chronic pancreatitis for periods as long as 7 yr.[3,6] Patients with abdominal pain from other causes could benefit from the celiac plexus block, which could provide reduced pain, improved lifestyle and function, decreased analgetic and antiemetic medication side effects, increased appetite, and decreased chance of surgery. However, anesthesiologists have been hesitant to use neurolytic blocks to treat pain in patients who are not terminally ill. The perceived limitations of the neurolytic celiac plexus block are: the risk of causing new neurologic deficits or new pain; the risk of other complications in patients who may be otherwise healthy; the fear that the block may slow recognition and diagnosis of an acute abdomen[3,7]; and the impression that pain relief will be much shorter than the patient's life expectancy. We believe that the risks of the celiac plexus block may be small compared to the benefit in some patients and that it may have a role in the treatment of benign abdominal pain. The following discussion addresses the major issues.

Brown and Moore‡ report knowledge of seven cases of paralysis after neurolytic celiac plexus block, but the incidence of disastrous neurologic complication cannot be estimated since the total number of blocks performed is unknown. The incidence of neurologic deficit was 0–1.5% in several retrospective studies.[3-5,8,‡] In most cases the deficits were sensory or motor changes in the distribution of lower thoracic or upper lumbar nerve roots and were probably caused by spread of neurolytic agent posteriorly into the psoas compartment or onto somatic nerves while withdrawing the needle. This may be avoided by clearing the phenol or alcohol from the needle before withdrawal. The transaortic technique may minimize the risk of spreading neurolytic agent into the psoas compartment or the epidural or subarachnoid spaces because the agent is deposited anteriorly to the aorta, where the celiac plexus lies, and because a smaller volume is used. We use no more than 25 ml, compared to the 50 ml used in the classical technique described by Moore.[4] Ischia *et al.* reported no neurologic deficits in their original description of the transaortic technique in 28 patients,[5] and Lieberman and Waldman found none in 124 patients.[9]

Other potential complications of the celiac plexus block are puncture of abdominal organs, pneumothorax, and retroperitoneal hematoma. Puncture of the kidney can be avoided by inserting the needle no more than 7.5 cm from the midline[4] and by using CT guidance. Pneumothorax occurs in 1–2% of blind or fluoroscopically guided blocks‡ but should not happen with CT guidance. Bleeding has not been a problem with the transaortic approach. In Ischia *et al.*'s study, serial CT scans showed no sign of retroperitoneal hematoma after the block in 6 patients, and the other 22 patients had no symptoms or signs of bleeding.[5] In Lieberman and Waldman's series, 124 patients had no signs of bleeding.[9] Thus, the major potential complications are infrequent and may well be avoided by using CT guidance and the transaortic technique.

Sympathetic nerves may regenerate after chemical neurolysis, leading to recurrent pain. However, Brown and colleagues[8] reported that if patients with pancreatic cancer developed recurrent pain after a neurolytic celiac plexus block, repeating the block had an 80% success rate and no increased incidence of complications. The block was repeated twice, at 2–6-month intervals, in three patients.[8] Our patient had four blocks separated by 2–4 months before longer-lasting pain relief was achieved. There is no data about the incidence of complications with multiple procedures, which may be necessary for patients with benign pain.

The side effects of celiac plexus block are minor and include nausea, diarrhea, and sharp abdominal pain upon injecting alcohol or phenol. Pain may worsen for a few days after the block but can be lessened by including local anesthetic in the neurolytic solution and giving analgesics as needed. Diarrhea occurs in up to 60% of patients but lasts no more than 48 h.[5] Hypotension may occur because of loss of sympathetic tone to the visceral vasculature. It is not as severe as the hypotension that may accompany epidural or spinal anesthesia and is uncommon in hydrated, healthy patients.[10] Mild postural hypotension occurs in 20–60% of patients in the first 12–36 h.[5]

A final objection to the neurolytic celiac plexus block is that it may mask signs and symptoms of an intraabdominal surgical emergency. This has never been observed in cancer patients[7] but might be more likely in patients with longer lifespans. After a celiac plexus block, abdominal processes with peritoneal inflammation will still cause pain, carried through spinal nerves from the body wall adjacent to the inflamed organ. The large bowel distal to the left colonic flexure and the pelvic organs send visceral sympathetic nerves through the hypogastric plexus and will retain intact visceral pain sensation. Sensation also should be intact in the retroperitoneal organs and mesentery, which send afferent nerves directly to the spinal nerves.[11] The neurolytic celiac plexus block may mask early signs of obstruction or ischemia of the small and large bowel for which the pain is entirely visceral if there is no peritonitis. Bowel obstruction may eventually cause vomiting, distention, and cessation of flatus, but bowel ischemia does not always present with pain. Chronic pain may interfere with the recognition of pain from an acute process, so all patients with chronic abdominal pain, and not just those treated by celiac plexus block, deserve vigilance for the signs and symptoms of acute abdomen.

‡ Brown DL, Moore DC: THe use of neurolytic celiac plexus block for pancreatic cancer: Anatomy and technique. Journal of Pain and Symptom Management 3:206–209, 1988.

We chose to treat our patient with neurolytic celiac plexus blocks for several reasons. She had experienced pain for 4 yr and was severely incapacitated. She was receiving conservative treatment with poor results and had also undergone upper abdominal vascular surgery, the most invasive possible treatment. Finally, since we find no evidence of significant morbidity associated with the neurolytic celiac plexus block, we felt that her young age and long life expectancy were reasons to proceed, rather than contraindications to this immediately beneficial procedure.

It was important to discuss thoroughly the risks and benefits of the procedure with the patient, since neurolytic blocks are not commonly used for benign pain. We told her that neurolytic celiac plexus block worked well for cancer pain but had not been studied for treating benign abdominal pain, so we could not predict the chance for success. Furthermore, her pain might return after a period of relief or pain relief might not result from the procedure. Other risks included neurologic deficits, transient hypotension or diarrhea, bleeding, and puncture of various organs. The possible benefits included rapid relief of pain and nausea, reduction in medication use, increased appetite, and improved bowel function. The alternatives included alterations in medication regime and continued psychological therapy.

We performed only one diagnostic block. A placebo response would have been apparent if the therapeutic block had not been effective. The decision to limit the number of diagnostic celiac plexus blocks was based on our estimation that the risks due to the neurolytic agent are probably no greater than the immediate risks of the block procedure. The acute risks are present whether one uses local anesthetic or neurolytic agent.

In summary, we report a case of patient with chronic benign abdominal pain of unknown etiology who has enjoyed pain relief and restoration of lifestyle for more than 1 yr after a series of neurolytic celiac plexus blocks. Repeat blocks effectively treat recurrent pain in cancer patients and have worked also for our patient. The reported incidence of minor neurologic deficits after this procedure is less than 1%, and catastrophic complications have appeared only in isolated reports. Thus, celiac plexus block may be indicated for some patients with chronic upper abdominal pain of nonmalignant origin. They may have pain for many years longer than cancer patients and hence have much to gain from including the neurolytic celiac plexus block in their treatment plan. In the absence of controlled studies of the efficacy of this form of therapy in patients with benign pain (as well as those with malignant pain),[12] the anesthesiologist must exercise judgment about the appropriateness of the procedure.

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