Alcohol block of the celiac plexus for control of upper abdominal pain caused by cancer and pancreatitis

Technical note

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A modified technique for alcohol block of the celiac plexus in cases of upper abdominal visceral pain is described. The hazards and complications of the procedure are discussed. The results in 11 patients are reported.

Key Words • intractable visceral pain • celiac plexus • alcohol block

Patients with malignant tumors in the pancreas, bile ducts, gallbladder, stomach, liver, or colon and patients with pancreatitis often develop pain in the upper abdomen and back. When this pain persists after primary treatment of the disease, a pain-relieving procedure is indicated.

The celiac plexus and splanchnic nerves contain pain-mediating fibers as well as sympathetic nervous system fibers which innervate the upper abdominal viscera. When the disease is confined to the upper abdominal viscera and does not involve the abdominal wall, intercostal nerves, or lumbar plexus, pain in the upper abdomen and back can be relieved by a celiac plexus block. This paper presents a technique of celiac plexus alcohol block, which is a modification of that of Bridenbaugh, et al.¹,²

Technique

The patient is questioned regarding distribution of pain and the presence or absence of numbness or weakness. A neurological examination is done to determine whether there is involvement of somatic structures. If it is clear neurologically that visceral pain is the sole or primary pain problem, a celiac plexus alcohol block is advised.

Preliminary Precautions

As recommended by Bridenbaugh and colleagues,¹ we discontinue ganglionic blocking agents such as antihypertensive drugs, antiemetic agents, and tranquilizers 24 hours before the celiac block. Narcotics are discontinued 2 to 4 hours before the block. The patient is told the alcohol injection will be quite painful for several minutes, that he may experience a feeling of difficulty in breathing, a burning sensation, or a feeling of being kicked in the stomach. The patient is also told of the possible side effects of postural hypotension, with dizziness and fainting on sitting and standing. The hypotension symptoms may be modified by the use of support stockings and abdominal binder, and the tilt table to get the patient used to the upright position.
Operative Procedure

The block is done with biplane x-ray control, using Polaroid film. The patient is placed in the prone position on the x-ray table, with a pillow under the abdomen. If pain prevents the patient from remaining in the prone position long enough for performing the block procedure, narcotics are given to reduce the pain. With the use of a sterile technique, a triangle is drawn on the patient's back. One corner is the caudal margin of the twelfth thoracic spinous process. The other two corners are 6 to 8 cm lateral to the first lumbar spinous process and on the lower margins of the twelfth ribs. Novocain (1%) is injected into the skin at the two lateral corners of the triangle.

We use an 18-gauge Teflon catheter, 15 cm (6 in.) long, which contains a 20-gauge metal spinal needle with a metal stilette (Fig. 1). The spinal needle protrudes about 2 mm beyond the tip of the Teflon catheter. The catheter has a Teflon stilette, which is put in place when the metal spinal needle is removed. The Teflon catheter containing spinal needles is introduced at the lateral corner of the triangle and directed in the perpendicular plane through the side of the triangle. The needle is directed toward the body of L-1 at an angle of 45° with the skin of the back (Fig. 2). The tip of the needle may encounter the transverse process of L-1 and have to be directed more caudally or more ce-
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Fig. 3. Left: Anteroposterior x-ray film showing the needles in position opposite the body of L-1 in a patient with carcinoma of the pancreas. Right: Lateral film showing the needles in the optimal position along the anterior aspect of the body of L-1.

phasisologically. After passing the transverse spine at L-1, the tip usually comes into contact with the lateral margin of the body of L-1. The angle of direction of the needle will then have to be increased from 45° to 60°, in order for the tip to slide past the lateral aspect of the L-1 vertebral body. Visualization by x-ray is used when placing the tip of the needle on the anterolateral aspect of the body of L-1 (Fig. 3).

The needles are placed bilaterally. Both needles are aspirated to be sure the needle tips are not in a vessel. The metal needles are removed, leaving the Teflon catheters in place. Both catheters are aspirated again to be sure that their tips are not in a vessel. Then 5 cc of 1% Novocain are injected into each catheter. Partial or complete relief of pain is considered evidence that an alcohol block will probably give satisfactory relief. Only a small amount of local anesthetic is injected to avoid interference with the effect of the alcohol.

After injection of the Novocain, the Teflon stilettes are placed in the catheters. The catheters are sutured to the skin to maintain their positions, and the external end of the catheters are tied together and covered with a sterile dressing. The patient is moved in the prone position to his room, or to the recovery room, and remains in that position for 2 to 3 hours, allowing for absorption of the Novocain and return of the pain. Then, 25 cc of 50% alcohol are injected into each catheter. This causes severe abdominal, chest, and back pain as well as shortness of breath for several minutes.

Relief of old pain may be complete and dramatic. After the alcohol injection, the Teflon stilettes are put back into the catheters, and the catheters are removed. The patient remains in the prone position for another 30 min after the alcohol injection. The following day the patient is allowed to sit and stand with supervision. Walking is allowed if there is no postural hypotension.

This technique has the advantage that a single placement of catheters under x-ray control can be used for both the diagnostic and the alcohol celiac plexus blocks. The Bridenbaugh report indicated that nerve fibers degenerate gradually over a period of several days after an alcohol injection, and that the immediate effects may not be as pronounced as the effects several days after the block.

Results

We have had experience with 11 patients using this modified technique with a single placement of catheters. Six patients had carcinoma of the pancreas. Of these, one had good relief for 3 months and fair relief for another 2 months before death. One had
50% relief of pain for 1 month between the block and death. One had complete relief of abdominal and back pain, but had persisting minimal right costal margin pain for 1 month between block and death. In one severely debilitated patient, the diagnostic block resulted in marked hypotension and the alcohol block was not done. Two patients had complete relief while in the hospital, but have been lost to follow-up.

One patient who had carcinoma of the bile duct with involvement of the pancreas experienced excellent relief of pain for 4 months between block and death.

One patient with carcinoma of the colon had complete relief of abdominal pain, but persisting right costal margin pain, which was relieved by percutaneous cordotomy. Four months after the block, some left hip pain, which did not require treatment, developed. The patient died 8 months after the block.

Our last patient had back and upper abdominal pain due to carcinoma of the lung with liver metastasis. Her pain had been constant for about 2 weeks and was aggravated by eating; she was receiving Demerol 50 mg every 4 hours. She has had excellent relief of her back and abdominal pain since the block was done 1 month ago, and eating is no longer painful. This was the only one of our patients who received the alcohol block in the recovery room under intravenous Innovar* neuroleptanalgesia administered by the anesthesiologist. The patient grimaced and showed signs of pain while the alcohol was being injected but afterward was amnesic for the period around the time of the injection. Her blood pressure fell from 110/80 to 85/60 within a few minutes after the alcohol injection after she had time to recover from the Innovar anesthesia. This was severe at first and required narcotics but gradually disappeared in 48 hours. Two of our patients have had postural hypotension. In one patient debilitated with carcinoma of the pancreas the hypotension following the diagnostic block was severe enough to result in syncope and the alcohol block was not done. Another patient developed a sensation of dizziness on sitting the first day after the alcohol block. This was associated with a fall of blood pressure from 110/80 to 80/60, and relieved by wrapping her legs with elastic bandages. This postural hypotension disappeared in about 72 hours. After that she was able to walk without dizziness and without pressure bandages on her legs.

**Discussion**

We would like to emphasize certain points which may increase the effectiveness and reduce the complications of the celiac block procedure. X-ray control and aspiration of the catheter are the two safeguards used in placing the catheter in an optimal and safe position on the anterior and lateral aspect of the first lumbar vertebral body. Blind placement of catheters is dangerous. In our experience after the catheters have been introduced, the first posterior, anterior, and lateral x-ray films made show that the catheter tip is not in an optimal position; several corrections under x-ray guidance may be needed. The catheter must be aspirated before an injection is made. Faulty placement of the catheter tip is not in an optimal position; several corrections under x-ray guidance may be needed. The catheter must be aspirated before an injection is made. Faulty placement of the catheter tip is indicated by the aspiration of blood, CSF, or air. Repositioning of the catheter will prevent the morbidity or mortality that can result from making an injection into the spinal canal, a blood vessel, or abdominal viscus. This did not occur in any of our patients.

The alcohol injection is quite painful, and

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even unbearable for the patient with a low pain threshold. The suffering during the time of the alcohol injection can be eliminated by the anesthesiologist administering Innovar intravenously. This anesthetic aid is an improvement in the technique which we plan to use in our future patients. However, the hazards inherent in the use of this drug must be realized and anticipated by expert supervision in the proper setting.

Some patients have upper abdominal pain and back pain as well as pain around the abdomen or chest, with radiation of pain into the lower extremities, or both visceral pain and somatic pain. In such patients, although the visceral pain may be relieved by a celiac plexus block, the somatic pain persists and may require dorsal root rhizotomy or cordotomy for relief.

References


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