

CONTINUOUS EPIDURAL BLOCK IN THE TREATMENT OF PANCREATITIS* †

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In pancreatitis the clinician is faced with a difficult situation in which the patients frequently are extremely ill. Treatment consists largely of supportive measures; surgical intervention to establish drainage has largely been abandoned (1). The pain of pancreatitis is often difficult to relieve and contributes to the shock and general deterioration of the patient; frequently, it is not relieved by large doses of morphine or other analgesics and, theoretically, morphine may aggravate the condition by increasing the spasm of the sphincter of Oddi. Nitroglycerine, atropine and ephedrine have been tried as adjuvants in relieving pain, but usually they are not effective.

ETIOLOGY

The etiology of pancreatitis is not definitely established. An attack frequently follows dietary indiscretion and occasionally an inflammatory disease, such as the mumps. Pancreatitis is frequently associated with disease of the biliary tract and it has been thought for some time that there is a reflux of bile into the pancreatic ducts by way of a common channel (2, 3). This could occur with spasm of the sphincter of Oddi; it has been shown that spasm can be produced by the presence of dilute hydrochloric acid in the proximity of the duodenal papillae and it has been suggested that it also may be produced by emotional disturbance or by drugs such as morphine. Another possible mechanism of injury to pancreatic tissue is by means of intrapancreatic obstruction as a result of metaplasia of duct epithelium (4).

TREATMENT

Splanchnic anesthesia in the treatment of pancreatitis was reported by Marion in 1945 (4) and by Gage in 1948 (6). The theoretical basis for this form of therapy was that it would relax the sphincter and allow drainage of the necrotizing and digestive fluid from the pancreas into the duodenum, and would dilate the spastic blood vessels in the involved

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region. Gage reported complete relief in a number of cases from a single injection blocking the splanchnic nerves, but Orr and Warren, reporting from the Lahey Clinic in 1950 (7), stated that a single injection gave only partial and temporary relief, and repeated injections were required for adequate treatment.

Because of the good results reported by others we performed splanchnic blocks and obtained relief of pain and other symptoms from a single injection in the first patients on whom the method was tried, thus demonstrating the efficacy of the procedure. It seemed worth while, however, to have a means of obtaining block of the splanchnic nerves for a longer period of time, and continuous epidural block was instituted in the next patients. It has been used in 17 cases.

TECHNIC

The epidural space is readily located in the average individual. As the spinal needle traverses the dense interspinous ligament and then the ligamentum flavum, there is a sudden decrease in resistance as the epidural space is entered; this may readily be felt in the plunger of a small syringe containing some solution and attached to the needle. Negative pressure either exists or is produced in the epidural space as a result of the introduction of the needle. This may be demonstrated by placing a drop of fluid in the hub of the needle or attaching a capillary tube containing fluid to the needle; when the epidural space is entered, the fluid will be drawn into the needle. A small, "U" shaped manometer may be attached to the needle to record negative pressure when the space is entered. To establish a continuous epidural block, a Huber tipped needle is inserted into the space in the lower thoracic or lumbar region and a plastic catheter is introduced through the needle, which is then withdrawn. An attempt is made to insert the catheter about 10 cm. cephalad; however, this is not always possible since the catheter may curl up on itself or at times paresthesias may be elicited; occasionally a continuous paresthesia occurs and in such an instance the catheter must be withdrawn and replaced. Procaine, 1 per cent or 0.5 per cent, with epinephrine, or xylocaine with epinephrine has been used for the block. An initial injection of about 2 cc. is given and an interval of about five minutes is allowed to elapse before the patient is checked to determine whether spinal anesthesia has been induced. When it is certain that a subarachnoid injection has not been made, 10 cc. of the solution is given. This will frequently give relief, but sometimes a second injection of 10 cc. of solution is necessary before the pain is relieved. Relief may occur at once or after several minutes. If it has not been possible to insert the catheter well cephalad, it may be necessary to lower the head of the patient or inject more solution to raise the level of the block to the proper segment.

The sixth, seventh, eighth and ninth thoracic segments of the cord

must be reached to obtain a block of the splanchnic nerves. The nerve supply of the pancreas is said to be mainly sympathetic fibers from cell bodies in the seventh, eighth and ninth segments of the cord (8); the axons leave the cord through the ventral roots where they are accessible for blocking in the epidural space, and reach the celiac ganglion as the splanchnic nerves. The splanchnic nerves also contain some visceral afferent fibers which carry sensory impulses.

Once the block has been established, the catheter is taped in place and the patients are allowed to assume any position or may even get out of bed. Injections have been repeated at intervals of from four hours to once daily, depending on the requirements of the individual patient. In our series, the catheter was allowed to remain *in situ* for four hours to several days. The longest period was five days in one patient. The catheter occasionally becomes obstructed because of a growth of granulation tissue at the tip, and it must be replaced. In his series, Orr used a continuous drip of 0.5 per cent procaine at the rate of about 10 cc. per hour, but we have not found this necessary to obtain adequate relief. Hypotension has been a complication in some of the cases but it is slower in onset than the hypotension associated with spinal anesthesia and has been adequately treated by the use of a vasopressor. Hypotension has been the only complication to date but a full armamentarium for resuscitation is kept immediately available, including a soluble barbiturate (sodium pentothal) to counteract a possible reaction to the local drug. Some of the patients are extremely ill and tolerate any procedure poorly so that they must be carefully observed.

RESULTS

In this series, 17 patients were given an epidural block by the continuous catheter technic. Subsequently, it was demonstrated that 2 of the patients did not have pancreatitis and the diagnosis was presumptive in some of the remaining patients, but the criteria for making the diagnosis were fulfilled. At autopsy, one of the patients was found to have a dissecting aneurysm of the abdominal aorta, and it is interesting to note that the epidural block gave complete relief for a few hours. Another patient, in whom the block had not given relief, died and a carcinoma of the pancreas was disclosed at autopsy. This patient had a serum amylase of 23 units, which is a normal level. Gage and others have stated that the diagnosis should be made without difficulty, but in our experience pancreatitis may be confused with other acute abdominal conditions. The serum amylase was elevated in all but 3 of our patients, but the degree of elevation was inconsistent. The lowest was 12 units; all other patients who are believed to have had pancreatitis had levels of from 42 to 118 units. This variation probably is due to the fact that the values for serum amylase fluctuate quite markedly and the level will be determined by the time at which the serum is taken. Symp-

toms which aid in making the diagnosis are nausea and vomiting, constant, severe abdominal pain, abdominal distention, tenderness in the upper portion of the abdomen, leukocytosis, toxicity, prostration and shock.

All 15 patients who are believed to have had pancreatitis obtained relief of symptoms from the block. The pain relief afforded offers a means of controlling one of the most severe manifestations of disease encountered in any patient. In addition, the block appears to have an effect on the course of the disease; it is uncertain what it accomplishes but the theory is that drainage of the pancreatic enzymes into the duodenum is brought about by relaxation of the sphincter of Oddi and that the spastic blood vessels in the involved area become dilated. The institution of the block coincided with the onset of improvement in these patients. In the words of one of them, "It was the turning point." In another patient an exploratory laparotomy was done because of the presence of an acute abdominal condition, and hemorrhagic pancreatitis was found. Because this patient was not as desperately ill as such patients frequently are, and since the pain could be relieved with moderate doses of morphine, it was decided to institute supportive treatment without the epidural block, and the patient subsequently made a satisfactory recovery. The disease, then, is self-limited in certain cases.

In chronic relapsing pancreatitis, subdiaphragmatic splanchnicectomies and unilateral or bilateral thoracolumbar sympathectomies have been done, with varying results reported (9). An occasional patient obtained relief following unilateral sympathectomy and others obtained only moderate relief after extensive bilateral sympathectomy; some obtained no relief following bilateral sympathectomies and some good results were only temporary. Therefore, proper appraisal of this form of treatment is difficult, but some type of nerve resection appears to offer the only possibility of permanent relief in these cases.

SUMMARY

Continuous epidural block was used in the treatment of 15 patients who are believed to have had pancreatitis. Relief of symptoms and apparently a favorable effect on the course of the disease was obtained in each instance. The continuous technic offers a simple means of repeating the blocks as long as necessary.

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THIRD BIENNIAL WESTERN CONFERENCE

The advance program for the Third Biennial Western Conference on Anesthesiology to be held at the Ambassador Hotel, Los Angeles, California, April 8-10, has been released by the Program Chairman, Dr. Francis E. Guinney. Continuing the precedent which was established at the two previous Western Conferences, one main subject, The Nervous System, has been elected for this conference. The program follows:

Wednesday, April 8, 1953

Anatomy of the Nervous System as Applied to Anesthesiology—Verne T. Inman, M.D., Professor of Anatomy, University of California School of Medicine, San Francisco.

Physiology of the Nervous System Applicable to Anesthesiology—John Field III, M.D., Chairman, Department of Physiology, University of California School of Medicine, Los Angeles.

Pathology of the Nervous System Complicating Anesthesia—Cyril B. Courville, M. D., Professor of Pathology, College of Medical Evangelists, Los Angeles.

Round Table—Anesthesia for Central Nervous System Surgery.

E. M. Papper, M.D.—Moderator
C. Hunter Sheldon, M.D.—Neuro-surgeon
John Dillon, M.D.—Physiologist
Cyril B. Courville, M.D.—Pathologist

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