Brief Reports

Partial Pancreatic Transection Due to Chiropractic Manipulation

Isolated blunt pancreatic injuries are rare, comprising less than 1 per cent of abdominal trauma and are usually the result of compression of the pancreas over the vertebral column between T12 and L2. Data regarding the incidence of abdominal complications after spinal manipulation are lacking. However, reports of serious complications including spinal cord injury, vertebral artery dissection, stroke, and transient increase in pain have been described. We present a rare case of partial pancreatic transection after spinal manipulation.

A 55-year-old man presented to the emergency department with escalating severe left upper quadrant abdominal pain. Onset occurred 15 hours before presentation and coincided with a spinal manipulation. The patient stated that his chiropractic visit consisted of spinal vibration followed by high-velocity, low-amplitude manipulation. The patient’s surgical history was significant for an abdominal gunshot wound with splenectomy and an appendectomy. His medical history was positive for hypertension, gout, and chronic back pain. The only medication before admission was ibuprofen. The patient strongly denied any recent abdominal trauma.

On presentation to the emergency department, the patient was diaphoretic, pale, and initially had a blood pressure of 123/89 mmHg and heart rate of 61 beats/min. Within 30 minutes of arrival, his blood pressure had dropped to 66/40 mmHg with a heart rate of 51 beats/min. The patient was started on 10 μg/kg/min dopamine, given 2 L lactated Ringer’s, and the surgeon was notified of the patient’s clinical status and abdominal findings. On physical examination the patient had peritoneal signs of involuntary guarding and rebound tenderness with a distended abdomen. Abdominal computed tomography (CT) scan showed blood in the left upper quadrant, subphrenic recess, and in Morrison’s pouch (Fig. 1). The abdominal aorta and the retroperitoneum were normal.

The patient failed to respond to intravenous fluids and transfusion and was taken to the operating room for surgical exploration. Approximately 3 L of blood was found in the left upper quadrant and the lesser sac. Significant adhesive disease was appreciated in the left upper quadrant. Pancreatic capsular disruption was noted and the pancreatic parenchyma was actively bleeding. The tail of the pancreas was firmly adherent to the patient’s floating left rib. Bleeding was initially controlled with compression across the midbody of the pancreas. The splenic artery was ligated as it ran superiorly to the pancreas, distal pancreatectomy was performed using a stapled technique, and the pancreatic capsule was oversewn. The remainder of the abdomen was explored and no other injury was identified. A 19-Fr drain was placed adjacent to the pancreatic stump and the abdominal incision was closed with a modified vacuum dressing because of significant

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Fig. 1. Abdominal computed tomography scan with contrast demonstrating loss of definition of the pancreatic tail associated with disruption of the capsule and parenchymal hemorrhage.
bowel edema. The patient was then transferred to a tertiary-care center for continued care. The abdomen was temporarily closed with a Whittman patch and wound vac dressing. Over 5 days, the patient’s fascial defect of 15 cm was approximated with serial tightening of the Whittman patch and then closed primarily. He was weaned off ventilatory support and discharged to home on postoperative Day 17.

On postoperative Day 33, the patient returned to the tertiary-care center with symptoms of malaise and fever of 39.4°C (103°F). The patient was admitted with an initial white blood cell count of 25.7 thousand cells/μL. Levofloxacin and metronidazole were started. An abdominal CT scan demonstrated a left upper quadrant fluid collection consistent with a peripancreatic abscess. CT-guided drainage was performed. Serum lipase and amylase values were within the normal range; however, the drained fluid levels were elevated to 5468 U/L and 7504 U/L, respectively. Culture of the drained fluid revealed coagulase-negative Staphylococcus aureus and enterococci. The patient was discharged home on the second hospital day with the drain in place. The drain “fell out” 1 week later. A CT scan at that time revealed inflammation without further abscess formation.

Isolated blunt pancreatic injuries are relatively rare and may not present with symptoms until several hours after injury. Most cases of pancreatic injury are the result of penetrating trauma. Blunt pancreatic injury is most commonly the result of compression of the pancreas over the vertebrae between T12 and L2, usually with an anteroposterior force vector such as an epigastric blow. Although this patient’s surgical history may play some role in the overall pattern of injury, this patient experienced an isolated pancreatic injury associated with a posterior mechanism of chiropractic manipulation, most likely as a result of compression or fixation of the pancreas against the vertebrae.

Diagnosis of pancreatic injury can be difficult because the symptoms are commonly nonspecific. Initial symptoms often consist of moderate epigastric pain that can radiate to the back and can then progress to peritoneal signs. Blunt abdominal trauma is commonly evaluated by ultrasound in trauma centers. Ultrasound can detect the presence of intraperitoneal fluid (greater than 250 mL) and is useful in evaluating specific anatomic regions including Morrison’s pouch, the splenorenal recess, and the pouch of Douglas. Endoscopic retrograde cholangiopancreatography is specific for main pancreatic ductal injury. Computed axial tomography is currently the test of choice for diagnosing blunt abdominal trauma. Findings on CT highly suggestive of pancreatic injury include peripancreatic hemorrhage, pancreatic edema, fluid in the lesser sac, and fluid between the splenic vein and pancreas. However, it has been shown that up to 40 per cent of patients with pancreatic ductal injury have normal CT examinations. In this case, CT revealed peripancreatic hemorrhage and loss of definition of the tail of the pancreas. Most pancreatic injuries are diagnosed, or further defined like in this case, on abdominal surgical exploration as a result of the frequent association with other abdominal organ injuries. Clinical correlation of physical findings complimented by imaging studies is important for timely diagnosis of pancreatic injury.

The American College of Surgeons Committee on Trauma defined a grading system to classify pancreatic injury by severity and recommended that treatment be guided by the grade of injury. It has been shown that the grade of pancreatic injury is predictive of development of complications as well as mortality. The pancreatic injury described in this case was consistent with a Grade III injury with distal ductal disruption. Lillian et al. reported a mortality rate of 30 per cent and morbidity of 64 per cent for Grade III pancreatic injuries. Mortality associated with blunt pancreatic injury is high and is associated with a progressive increase with a delay in diagnosis. Complications seen after pancreatic injury include development of pseudocysts, abscess formation, and fistula formation. Such complications are reported in 11 to 62 per cent of patients with pancreatic injury and their occurrence increases morbidity and mortality. The strongest predictive factors for morbidity and mortality are location of injury and integrity of the main pancreatic duct.

Most spinal manipulations performed by chiropractors consist of a thrust of high velocity through either a long or short lever arm. Although the amount and quality of research describing risks and benefits of spinal manipulation are quite limited, a systematic review by Ernst et al. showed that spinal manipulation results in a mild adverse event in 30 to 61 per cent of all patients, most of which are transient in nature. Transient adverse effects include increased discomfort, headaches, and tiredness. Several serious adverse effects have also been described including vertebral artery dissection, disk herniation, cerebellar infarction, cauda equina syndrome, and phrenic nerve injury. The occurrence of such events is unknown as a result of underreporting and failure of clinicians to pursue a history of spinal manipulation in such patients. No literature was found describing an incidence of abdominal organ injury after spinal manipulation.

Isolated pancreatic injury is rare, difficult to diagnose, is associated with significant morbidity and mortality, and should always be considered in cases of blunt abdominal trauma. Diagnosis of pancreatic...
injury can be accomplished in the trauma setting with identification of free abdominal fluid by ultrasound or abdominal CT in hemodynamically stable patients. Spinal manipulations have been associated with several adverse effects, although their frequency is not well known. In this case, the patient’s history of a previous gunshot wound to the abdomen with surgical splenectomy resulted in the pancreatic adherence around the vertebrae and ribs. It is speculated that the posterior force of chiropractic manipulation caused the pancreatic injury resulting from its compression against the vertebrae. Although isolated pancreatic injury is rare, and often difficult to diagnose, this injury should be considered in any patient presenting with a history of abdominal trauma.

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