

A case of acute pancreatitis secondary to spinal cord injury

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Abstract

Acute pancreatitis (AP) is a frequent and potentially life-threatening disease with high morbidity and mortality. The overall mortality of AP is approximately 5%. Alcohol consumption and gallstones are the main etiology of AP. Hypertriglyceridemia, idiosyncratic reactions to drugs, anatomic alterations and ascaris lumbricoides can also give rise to AP. Although spinal cord injury (SCI) can cause AP, however, the case of induced by cervical spine surgery has not been reported. A 61-year-old man with quadriplegic and respiratory distress received cervical spine surgery for spinal cervical spondylosis and multi-stage longitudinal ligament. He was admitted to intensive care unit (ICU) after tracheotomy for progressive dyspnea, one day after the cervical spine surgery. The patient was diagnosed with AP, in the absence of any identifiable causes of pancreatitis. He was treated with intravenous fluids, no oral feeding, enteral and parenteral nutrition, antibiotic and mechanical ventilation. The patient's condition gradually improved after the treatment. This case describes a case of postoperative cervical spondylosis that led to AP. In this report, we highlight the importance of early diagnosis and subsequent appropriate treatment. We conclude that the outcome can be favorable, if the treatment is appropriate.

INTRODUCTION

Spinal cord injury (SCI) due to spinal cord trauma (SCT) has increased steadily with frequent traffic accidents recently. Damage to the spinal cord results in the impairment of specific functions controlled by the nerves located at, or below, the level of spinal cord. SCI is a life-altering event for the injured individual that is usually associated with loss of motor and sensory function, and sexual impotence, with decreased bowel and bladder sensation with poor or no voluntary control of evacu-

ation that can lead to decreased quality of life. But SCI has rarely been implicated as a cause of AP.

AP is characterized by aseptic pancreatic inflammation. AP is not a rare disease and may be life-threatening if it is severe, therefore is an important condition leading to considerable morbidity and mortality. Overall, 15% of AP patients may develop severe acute pancreatitis (SAP) (Guo *et al.* 2014), and the mortality of SAP is approximately 13%. Early and accurate diagnosis and subsequent appropriate treatment can achieve better therapeutic effect. We herein present a case of AP

caused by SCI which was improved following appropriate treatment.

CASE REPORT

The patient, a 61-year-old man, 172 cm in height and 65 kg in weight, was hospitalized at our hospital for quadriplegic and respiratory distress. The patient received cervical spine surgery for spinal cervical spondylosis and multi-stage longitudinal ligament. The procedure was uncomplicated and the estimated intraoperative blood loss was 0.8 L. The patient was admitted to intensive care unit (ICU) after tracheotomy for progressive dyspnea, one day after the cervical spine surgery. Clinical examination revealed that his respiratory rate was 20 times/min, blood pressure 89/49 mmHg, body temperature 38.3 and pulse rate 72 bpm. His abdomen was found to be distended. The muscle power on the bilateral upper limbs and lower extremity was 0/5. The sensation of the four limbs was loss.

Lower extremity reflexes were diminished with bilateral extensor plantar responses. A magnetic resonance imaging (MRI) revealed high intensity at the C4 and C5 spinal cord. The initial laboratory studies showed a serum lipase level of 1069, blood amylase 981 U/L, WBC $8.58 \times 10^9/L$, N 92.3%, RBC $2.8 \times 10^{12}/L$, Hb 88 g/L, urine amylase enzyme 3077 U/L, iCa 1.19 mmol/L. A follow-up abdominal computed tomography (CT) revealed an enlarged pancreatic with increased infiltration around the pancreas, consistent with a diagnosis of acute pancreatitis (Figure 1).

The patient was diagnosed with AP, in the absence of any identifiable causes of pancreatitis. Considering the temporal sequence of events, the cervical spine injury was highly suspected to be the triggering factor.

He was treated with intravenous fluids, no oral feeding, enteral and parenteral nutrition, antibiotic and

mechanical ventilation. The patient's condition gradually improved after the treatment. He was transferred to the orthopedics ward 50 days after admission and was discharged to rehabilitation facility 20 days later.

DISCUSSION

It is extremely difficult to assessing abdominal complications in patients who have previously suffered high SCI because the resultant loss of sensory, motor, and reflux function of the abdominal wall can mask the typical signs of acute abdomen such as tenderness, muscle rigidity, and peritoneal rebound pain (Berlly *et al.* 1984). Although the retrospective study conducted by Nobel *et al.* (2002) demonstrates an average incidence of 3% of acute pancreatitis in cases of SCI, but acute pancreatitis caused by iatrogenic Spinal cord injury has been rarely reported. Compared to acute pancreatitis caused by other reasons, the typical clinical manifestations of abdominal pain, nausea, vomiting and other gastrointestinal symptoms may not occur due to neurological damage. The other atypical signs, such as fever, bloating, low blood pressure and heart rate often are considered symptoms of cervical spinal cord injury. We argued that, in this case, it would develop into severe acute pancreatitis if accurate diagnosis were not made timely. The identification of the etiology of acute pancreatitis is crucial for the management during the early phase of the disease and also for the prevention of recurrence of AP (Phillip *et al.* 2014).

The patient showed only mild abdominal distension and hyperamylasemia. But kidney disease, mumps, intestinal obstruction, gastrointestinal perforation and other reasons all can also cause Hyperamylasemia. Therefore abdominal computed tomography (CT) was ordered, and it revealed pancreatic edema. So the diagnosis of acute pancreatitis was clinically and biologically suggested and confirmed by CT-scan. Based on this case, we suggested that for patients with no history of alcohol abuse, without hyperlipidemia, or biliary disease or other causes, while excluding drugs, metabolic diseases, connective tissue disease and other rare causes of pancreatitis, cervical spinal cord injury may be considered for causing acute pancreatitis.

In this case, the diagnosis of AP was based only on laboratory methods with serum amylase, lipase tests and with radiographic examinations (CT or MRI) (Pirolla *et al.* 2014). The radiographic examinations as is very important as typical clinical parameters could be absent because of either the neurological deficit by the SCI.

The mechanism of AP caused by spinal cord injury is not clear. There are several possibilities. Firstly, AP in the setting of high-level spinal cord injury may result from a combination of locally mediated sphincter of Oddi dysfunction due to failure of autonomic vagal innervations of the pancreatic gland (Nobel *et al.* 2002; Gore *et al.* 1981; Di Francesco *et al.* 1996). Secondly,



Fig. 1. Abdominal computed tomography reveals enlarged pancreas and increased infiltration around pancreas (arrow).

it was reported that the hemodynamic changing of pancreas after SCI can cause pancreatitis (Carey *et al.* 1977). Thirdly, the gastrointestinal dysfunction caused by SCI can result in stasis of pancreatic secretions and pancreatitis.

Although Spinal cord injuries-induced pancreatitis is rarely reported, iatrogenic invasive procedures of cervical spine should be included as a potential etiology of AP. So pancreatitis should be considered when persistent abdominal symptoms are encountered in patients after spinal surgery. Overall, with appropriate treatment, the outcome can be favorable.

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