Conservative Management of Isolated Proximal Traumatic Pancreatic Injury: A Case Report

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ABSTRACT

Background: Blunt traumatic pancreatic injuries are rare conditions in case of motor vehicle collision (MVC) and isolated injuries even rarer. Surgical approach is usually preferred in case of advanced pancreatic injuries. In this study we try to shed the light on the role of completely conservative approach in the management of a proximal pancreatic injury.

Case Summary: A 19-year-old male patient presented to the ER three days following MVC with upper abdominal pain. Abdominal US showed free intraperitoneal fluids and laboratory results showed elevated total leukocyte count, serum amylase and lipase. CT showed transection at pancreatic head which was grade 5 with free intrabdominal fluids; hence isolated pancreatic injury was diagnosed. At that point, the patient was hemodynamically stable and conservative management was implemented. He was admitted in the ICU for three days followed by 28 days in the ward where patient condition was closely monitored on daily bases. Serial interval imaging showed spontaneous resolution of the intraperitoneal collection together with improvement of the injury, respectively. After completing his course, the patient was discharged and monitored as an outpatient.

Conclusion: Conservative treatment can be adopted in patients with proximal pancreatic injuries with complete duct disruption in otherwise hemodynamically stable patients.

Keywords: isolated, pancreas, proximal, trauma.

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I. INTRODUCTION

Traumatic pancreatic injury (TPI) is a relatively uncommon condition due to the retroperitoneal position of the pancreas. The pancreas is closely related to important structures like the duodenum, stomach, renal veins, and splenic vessels. To have an isolated TPI is quite rare as it is usually associated with multiple organ injuries after a motor vehicle accident [1]. The prevalence of the condition ranges from 2% to 5% of the blunt trauma cases. However, it is often associated with serious complications that increase the rates of morbidity and mortality [2], [3]. The acceleration-deceleration property of the blunt trauma induces a crushing injury to the organ, especially the body of the pancreas, against the first and second lumbar vertebrae (L1, L2). [4], [5].

One of the most fatal complications of pancreatic injuries is the damage of the pancreatic duct which leads to leakage of the pancreatic enzymes into the abdomen and inducing an inflammatory process and generalized septic shock that can be fatal in some cases [6]. Clinical presentation and physical examination are usually not reliable factors in the diagnosis and management of the condition [7]. The picture of acute pancreatitis, caused by pancreatic trauma, usually presents

with upper abdominal pain (specifically epigastric pain) radiating to the back, elevated leucocytic count, and raised serum amylase. Early detection and proper management can considerably change the outcome of the condition [8]. However, the symptoms are usually insignificant and sometimes masked or misdiagnosed by the other symptoms associated with the coexisting abdominal organ injury. [9], [10]. Therefore, it is quite challenging to early diagnose and manage the case.

The management of blunt TPIs is determined by several factors like the grade of the injury, the involvement of the pancreatic duct, the condition of the patient, and the associated abdominal organ injuries [11]. Hemodynamically stable patients with intact pancreatic duct (Confirmed by Magnetic Resonance Cholangiopancreatography MRCP) are usually treated conservatively. However, if one of the previously mentioned serious signs presents, then a surgical approach is determined for the patient [12]. Most of the literature discussed the surgical approach for managing TPI cases and few studies reported the role of conservative treatment with the condition. In this case report, we adopted the conservative approach with a case of TPI and discussed the main findings in the following sections.

II. CASE PRESENTATION

A 19-year-old male patient presented to the emergency room (ER) with acute upper abdominal pain. The pain was of sudden onset, progressive nature and lasted for a few hours. It was not radiating to any region nor associated with nausea or vomiting. The patient denies any change in bowel habits. History revealed that the patient experienced a motor vehicle collision (MVC) three days ago and was admitted to his local hospital for 24 hours under observation. At that time, his biochemical markers and ultrasound abdomen were unremarkable.

A. Physical Examination

primary survey was assessed, and the vital signs were: Heart Rate (HR) was 103 beats/ minute, Blood pressure was 127/90, Respiratory Rate was 18 breaths/minute, Temperature was 36.6, and oxygen saturation SPO₂ was 100% on room air. Local examination revealed mild abdominal tenderness and guarding in the upper abdominal quadrant.

B. Laboratory Investigations

Primary laboratory tests were ordered for the patient. CBC gave a picture of leukocytosis $20.1 \times 10^9/L$. Liver Function Tests (LFTs) and Renal Function Tests (RFTs) were normal. There was a significant increase in serum amylase and lipase, (1280 IU/L for a normal value of 30-110 IU/L) and (300 IU/L for a normal value of 0-160 IU/L), respectively.

C. Radiological Investigations

In his primary Chest X-Ray, there was no air under the diaphragm. Upon suspecting TPI, CT abdomen with contrast was ordered which revealed a transection at pancreatic head grade 5 (Fig. 1).

Fig. 1. CECT abdomen, showing Transaction of the pancreatic head, grade 5.

D. Management

The patient was initially admitted to the Intensive Care Unit (ICU), Non-Per Oral (NPO), and Total Parenteral Nutrition (TPN) were determined. He was also prescribed broad-spectrum antibiotics mainly Piperacillin/tazobactam 4.5 g IV q 8 h, analgesics, omeprazole 40 mg IV OD and short acting somatostatin analogue Octreotide. Pancreatic

endocrine and exocrine functions were supported with insulin and Creon respectively.

Multi-disciplinary team approach implemented, including radiologists, interventional radiologists, intensivists, microbiologist, infectious disease team, dietitian, and physiotherapist whom they were all involved in the management of this patient in a regular basis. He underwent percutaneous drainage of the intra-abdominal collection as the ultrasound revealed free fluid collection in the abdomen and pelvis.

There was discussion to prepare the patient for exploratory laparotomy, central pancreatectomy + pancreatojejunostomy versus spleen-preserving distal pancreatectomy versus pancreaticoduodenectomy. However, the decision for surgery was postponed for three main reasons:

1. The patient was hemodynamically stable with no evidence of pancreatic insufficiency.
2. The level of pancreatic transaction is very proximal, so he will need to have pancreaticoduodenectomy which carry high morbidity and mortality in his condition especially he was delayed diagnosis.
3. There was only duodenal contusion with no evidence of perforated viscus or other intra-abdominal injuries.

Because of these reasons, surgical intervention would have been unjustified at this stage; in particular, patient showed good response to conservative measures.

Follow up with MRCP confirmed accuracy of the pancreatic head injury with complete pancreatic duct disruption and fluid leakage despite intra-abdominal drains. (Fig. 2-4).

Fig. 2. Transverse view of MRCP, showing a pancreatic head injury and complete main pancreatic duct disruption.

Fig. 3. Coronal view of MRCP, showing a pancreatic head injury and complete main pancreatic duct disruption.

Fig. 4. 3D view of MRCP, showing a pancreatic head injury and complete main pancreatic duct disruption.

The patient's general condition was stable. His symptoms continued to improve on the medical regimen. Thereby, we decided to complete the course of conservative treatment and regularly assess the patient's condition for any complications. In regard to the intrabdominal collection, it resolved, and drain removed on day 27 of admission.

He stayed 3 days in ICU followed by 28 days in the ward. During this time interval, the patient's vital signs, clinical examination and investigations were carefully assessed and remained normal. He was discharged from the hospital on day 34 post injury and kept for regular visits in outpatient department.

Follow up abdominal CT done after 6 weeks of discharge, showed resolution of the intra-abdominal fluid, resolution of the duodenal contusions, and the pancreatic head injury (Fig. 5). Thereafter, patient developed pancreatic pseudocyst which spontaneously resolved on follow up and he was followed up for a total of twelve months period uneventfully.

Fig. 5. CECT Abdomen transverse view, 10 weeks after the injury, showing complete resolution of the intra-abdominal fluid.

III. DISCUSSION

Blunt traumatic pancreatic injuries are rare conditions in case of MVC. They are usually presented as combined injuries with other major organ injury like liver or spleen. (2) According to the American Association for Surgery of Trauma (AAST), pancreatic injuries are classified into five main grades. (13) (Table I).

TABLE I: AMERICAN ASSOCIATION OF THE SURGERY OF TRAUMA CLASSIFICATION OF PANCREATIC TRAUMA ORGAN-INJURY-SCALE (AAST-OIS)

Grade	Injury	Description of pancreatic injury
I	Hematoma	Minor contusion without ductal injury
	Laceration	Superficial laceration without ductal injury
II	Hematoma	Major contusion without ductal injury or tissue loss
	Laceration	Major laceration without ductal injury or tissue loss
III	Laceration	Distal transection or pancreatic parenchymal injury with ductal injury
IV	Laceration	Proximal transection or pancreatic parenchymal injury involving the ampulla
V	Laceration	Massive disruption of the pancreatic head

The management of each pancreatic injury depends on the previous grading and consideration of patient condition and other injuries. Usually, surgical intervention is the preferred approach in grade three to five [14]. In our case, the patient was quite younger than the average age of the patients presented with pancreatic injuries [15], [17], [18]. Menahem et al. reported that mean age of the patients ranges from 20 to 45 years old [14]. In addition, studies showed that pancreatic injuries are more common in males than females and mostly caused by road traffic accidents and this was consistent with our patient [19].

Clinical diagnosis of pancreatic injury is clinically challenging and needs high index of suspicion. The patient may present with upper abdominal pain radiating to the back together with a history of recent blunt trauma [20], [21]. This is the case in our patient who presented with upper abdominal pain and previous history of MVC. Although the pain was not typically radiating to the back.

Laboratory examination revealed mild leukocytosis associated with significant elevation in serum amylase and lipase. Mayer et al. and Simon et al. emphasized on the importance of serum amylase and lipase as early detectors of pancreatic injury in pediatric age group [22], [23]. Singh et al. concluded that serum amylase and lipase are elevated in 90% and 95% of the studied patient, respectively.

In our case, abdominal CT showed a transaction of the pancreatic head, grade 5 which we were able to successfully manage conservatively. In contrast, studies showed that advanced grades of pancreatic injuries are managed surgically [14]. Cogbill et al. showed that grade III and IV of pancreatic injuries are managed by distal pancreatectomy or surgical drainage [15]. Sharpe et al. reported the same results for the management of grade III or IV [16]. In addition, the suggested approach for grade five is pancreatic jejunostomy of the caudal stump and suturing of the cephalic stump [14].

If the traumatic pancreatic injury diagnosed late as in our case, surgical intervention would be associated with high mortality and morbidity [24]. In our study, the patient was late diagnosis and hemodynamically stable. Hence, we tried to follow a non-operative approach and kept the patient on a close follow up monitoring of his vital signs, intraperitoneal collections and we supported his pancreatic function by resting the pancreas in which he was kept nil by mouth and on parenteral nutrition. When we started feeding him orally, we supplemented pancreatic enzyme Creon with his feeds to minimize exocrine dysfunction. Regular follow up showed a significant reduction in the intraperitoneal collection and stabilization of the vital signs. This is consistent with Akhrass et al. who suggested that serial clinical examination and repeated CT scans needed to follow an isolated pancreatic injury if decided for conservative management. [17] The patient was discharged after completing the conservative course.

IV. CONCLUSION

Conservative approach can be adopted even in cases of advanced pancreatic injury with main pancreatic duct complete disruption if the patient was hemodynamically stable, showed no sepsis and responded well to non-operative measures. Surgical management is still an option if patient developed any complication or his clinical condition not improving with conservative approach.

Multidisciplinary team approach needs to be implemented when managing those patients and nevertheless involving patient and family in regular updates accordingly.

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