

Grade IV blunt pancreatic trauma and pseudocyst successfully treated with Ultrasound-guided percutaneous catheter drainage

Ang Li¹, Jun jie Xiong², WeiMing-Hu³, ZhaoDaZhang⁴

ABSTRACT

We present a 16-year-old boy with complete major pancreatic duct disruption in pancreatic neck. According to the American Association of Surgical Trauma Classification, the patient was diagnosed with pancreatic injuries grade IV and pseudocyst which was managed successfully by way of Ultrasound-guided percutaneous catheter drainage.

KEY WORDS: Pancreatic trauma, Major pancreatic duct disruption, Pancreatic pseudocyst, Drainage.

Pak J Med Sci April - June 2012 Vol. 28 No. 3 546-549

How to cite this article:

Li A, Xiong JJ, WeiMing-Hu, Zhang ZD. Grade IV blunt pancreatic trauma and pseudocyst successfully treated with Ultrasound-guided percutaneous catheter drainage. Pak J Med Sci 2012;28(3):546-549

INTRODUCTION

Injury to the pancreas is a rare occurrence because of its retroperitoneal location, most commonly seen with penetrating injuries. Blunt pancreatic trauma (BPT) is said to be uncommon with published reports of incidence ranging from 0.2% to 12%.^{1,2} Currently, according to the American Association for the Surgery of Trauma (AAST), pancreas organ injury scale is divided into five grades (I-V).³ Generally speaking, conservative management of stable patients with blunt pancreatic injury is the

norm in cases of low-grade (I-II) injuries. However, the patients with high-grade (III-IV) injuries who are managed by the non-operative care is rare and controversial.^{4,5}

CASE REPORT

A 16-year-old boy was admitted to our hospital following a handlebar injury to the abdomen when falling from a bike. He suffered from episodic abdominal pain and recurrent vomiting. Through physical examination (PE), his vital signs were stable, especially the blood pressure and breathing. Laboratory studies revealed a white blood cell (WBC) count of $13.99 \times 10^9/L$ (normal range, $4.0-10.0 \times 10^9/L$), serum amylase (AMY) 459 IU/L (normal range 25-125 IU/L), serum lipase 658.0 IU/L (normal range 13-60 IU/L) and calcium level 2.04 mmol/L (normal range 2.1-2.7 mmol/L). Furthermore, the initial abdominal enhanced computed tomography (CT) scan demonstrated injury to the proximal neck of the pancreas with evidence of complete ductal disruption and a large amount of fluids in abdomen and pelvic but only some free fluid in the retroperitoneal area (Fig.1). Based on symptoms, laboratory examinations and imaging findings, he was diagnosed with grade IV blunt pancreatic trauma and secondary peritonitis.

1. Ang-Li, MD,
 2. Junjie-Xiong, MD,
 3. WeiMing-Hu, MD,
 4. ZhaoDa-Zhang, MD,
- 1-4: Department of Hepato-Biliary-Pancreatic Surgery, West China Hospital, Sichuan University, 37 GuoXue Rd, Chengdu 610041, Sichuan Province, China.

Correspondence:

ZhaoDa-Zhang,
Professor,
Department of Hepato-Biliary-Pancreatic Surgery,
West China Hospital, 37 GuoXue Rd,
Chengdu 610041,
Sichuan Province, China.
E-mail: westch2011@163.com

* Received for Publication: December 6, 2011

* Accepted: February 18, 2012

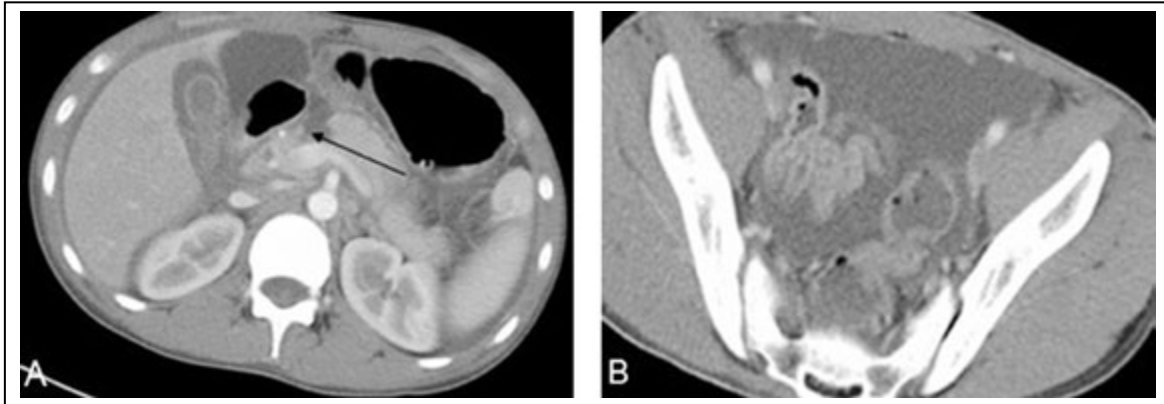


Fig.1: (A) The initial computed tomography (CT) scan suggested a lesion of the pancreatic neck associated with main duct injury (arrow) and a large number of fluids in abdomen. (B) The initial computed tomography (CT) scan suggested a great many fluids in pelvic.

Considering both hemodynamic stability and no other serious multiple organ injury, we decided to manage the patient conservatively with bowel rest, total parenteral nutrition, electrolyte replacement, analgesics, proton pump inhibitors, octreotide, tienam and Ultrasound-guided percutaneous catheter drainage in the pelvic. The biochemical examination of the drainage fluid showed amylase and lipase were 11080 IU/L, 16971 IU/L respectively. The abdominal pain of the patient was relieved after appropriate treatment. However, in the next five days, the patient had gradually increased abdominal distension and vomit. The second CT showed a large number of parcel fluids on the pancreatic head, namely immature pseudocyst. In addition, the CT clearly disclosed pancreas neck fracture and a small amount of abdominal fluids (Fig.2).

Considering immature pseudocyst, we conducted an Ultrasound-guided percutaneous drainage of pancreatic pseudocyst and a drainage tube with multi-side holes was placed in the centre of the cyst. At this stage, previous conservative treatment was kept on continuing. Six days later, the nasointestinal tube was placed in the distal duodenum through the gastroscopy. After that, liquid nutrients were given via the nasointestinal tube. Unexpectedly, in this way, the patient had rapid recovery after treatment, since there were no worse symptoms such as abdominal distention, fever, nausea and vomit. Several days later, drainage fluids were reduced to less than 400ml everyday. To confirm the improvement of the condition, blood examinations showed white blood cell (WBC) count of $7.97 \times 10^9/L$, serum AMY 315 IU/L, serum lipase 354.0 IU/L and calcium level 2.19mmol/L. Therefore, it suggested

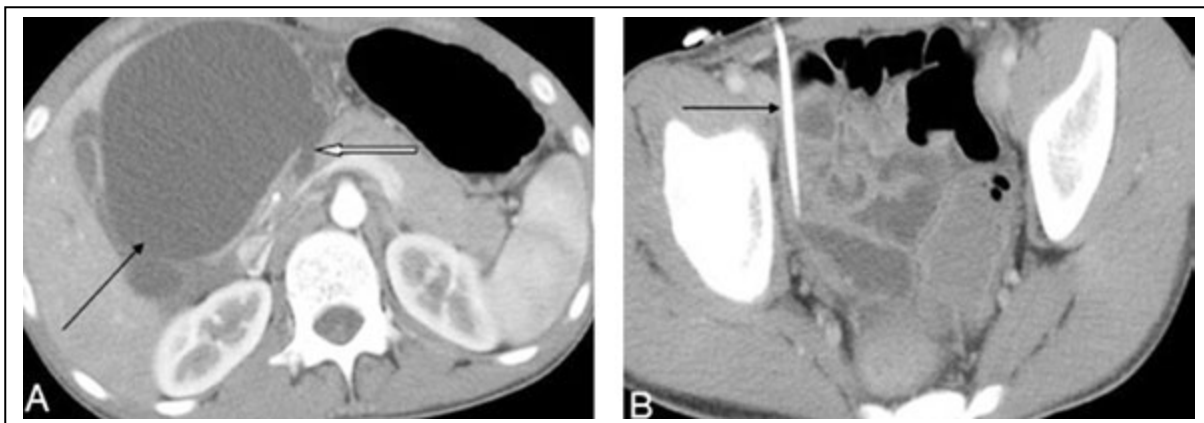


Fig.2: (A) CT on the 5th hospital day showed pancreatic pseudocyst in the right epigastrium (black arrow) and a deep laceration transected the pancreas (white arrow). (B) CT on the 5th hospital day showed reductive fluids in pelvic comparing with previous image. A drainage tube was placed in pelvic (black arrow).



Fig.3: CT on the 9th day showed contractible pancreatic pseudocyst, drainage tube (black arrow) and the department of pancreatic injury (white arrow)

that the peritonitis of the patient had disappeared through the treatment. To our surprise, when re-reviewing abdominal CT for the patient after 10 days, only a very small amount of fluids in the pancreatic head were found. However, the disruption of the pancreatic parenchyma tended to close (Fig.3).

One month later, a follow-up CT scan showed the pancreas to be normal and the pseudocyst at the pancreatic head disappeared (Fig.4). So, the drainage tube was pulled out. In order to keep close follow-up, seven months later, the abdominal CT showed that patient had fully recovered and had no complication (Fig.5).

DISCUSSION

Blunt pancreatic trauma is a rare occurrence and so a consensus about optimal management is not readily available. The severity of pancreatic trauma is primarily dependent on the associated injuries and secondarily related to main pancreatic duct injury responsible for complications: pancreatitis, pancreatic fistula and pancreatic pseudocysts.³ At present, treatment of pancreatic trauma-related complications often requires a combination of endoscopic, interventional and surgical approaches.⁶ Generally, in the absence of main pancreatic duct lesions, nonoperative treatment is advocated.⁷ Traditionally, severe pancreatic trauma involving disruption of the main pancreatic duct usually requires operative management.⁸

Recently, the successful non-operative treatment of Grade IV pancreatic injuries by pancreatic stent has been described as having good results.⁹

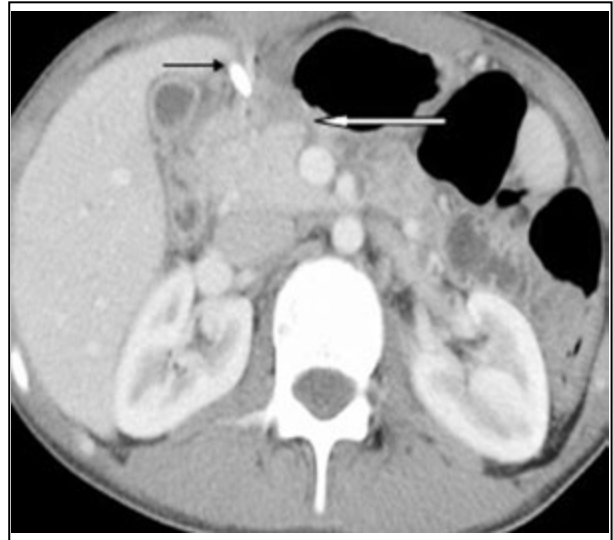


Fig.4: The CT at 1 months showed disappearance of the pseudocysts at the pancreatic head, drainage tube (black arrow) and the closed place of pancreatic disruption (white arrow).

However, post-ERCP pancreatitis occurred from 3% to 14% as a result of this strategy. Currently, there is no major pancreatic duct injury or the injury involves only the distal duct, percutaneous drainage should be considered the primary therapeutic procedure for traumatic pancreatic pseudocyst.

However, in our case, special condition was that the patient had the main pancreatic duct injury. Moreover, as result of the thin cyst wall, internal drainage such as cystogastrostomy or Roux-Y cystojejunostomy was inappropriate which might

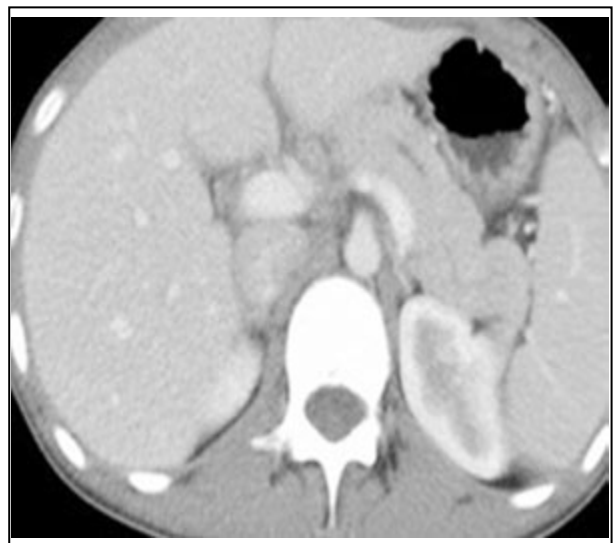


Fig.5: The CT at 7 months showed no occurrence of the complications in abdomen.

give rise to a large number of complications such as anastomotic fistula, infection and cyst recurrence.

From our treatment, we speculate that the following factors determine the good outcome of the patient. At first, Ultrasound-guided percutaneous catheter pelvic drainage played an important role in reducing the rate from chemical peritonitis to bacterial peritonitis and maintained hemodynamic stability of patient. Additionally, the drainage of pancreatic pseudocyst quickly alleviated the symptoms of the patient. Finally, it is also important that the disruption of major pancreatic duct without obstruction which made the closure of the pancreatic duct was possible.

In conclusion, the presenting case demonstrated that Ultrasound-guided percutaneous catheter drainage for grade IV blunt pancreatic injury with pseudocyst may avoid endoscopic stent placement or surgery. However, the selection of such strategy demands that there is no obstruction in major pancreatic duct. In the meantime, continuous physical, laboratory, and radiological monitoring during follow-up are also important. When it comes to deteriorating state of an illness, surgical treatment is necessary for the patient.

REFERENCES

1. Cirillo RL Jr, Koniaris LG. Detecting blunt pancreatic injuries. *J Gastrointest Surg* 2002;6(4):587-598.
2. Gupta A, Stuhlfaut JW, Fleming KW, Lucey BC, Soto JA. Blunt trauma of the pancreas and biliary tract: a multimodality imaging approach to diagnosis. *Radiographics* 2004;24(5):1381-1395.
3. Moore EE, Cogbill TH, Malangoni MA, Jurkovich GJ, Champion HR, Gennarelli TA, et al. Organ injury scaling, II: pancreas, duodenum, small bowel, colon and rectum. *J Trauma* 1990;30(11):1427-1429.
4. Wales PW, Shuckett B, Kim PC. Long-term outcome after nonoperative management of complete traumatic pancreatic transection in children. *J Pediatr Surg* 2001;36(5):823-827.
5. Mercantini P, Virgilio E, Bocchetti T, Capurso G, Nava AK, Ziparo V. Is Entirely Conservative Management a Correct Strategy for Hemodynamically Stable Patient with a Grade IV Blunt Pancreatic Injury? *World J Surg* 2011;35(4):933-934.
6. Stawicki SP, Schwab CW: Pancreatic trauma: demographics, diagnosis, and management. *Am Surg* 2008;74(12):1133-1145.
7. Malgras B, Douard R, Siauve N, Wind P. Management of left pancreatic trauma. *Am Surg* 2011;77(1):1-9.
8. Hsieh CH, Liu NJ, Chen RJ, Fang JF, Lin BC. Endoscopically placed pancreatic stent in a patient with concomitant two locations of main pancreatic duct disruption following pancreatic trauma. *Hepatogastroenterology* 2003;50(49):269-271.
9. Abe T, Nagai T, Murakami K, Anan J, Uchida M, Ono H, et al. Pancreatic Injury Successfully Treated with Endoscopic Stenting for Major Pancreatic Duct Disruption. *Intern Med* 2009;48(21):1889-1892.

Authors' contributions:

Ang Li and Jun jieXiong collected research data and drafted the manuscript. WeiMing-Hu and ZhaoDa-Zhang reviewed the literature. ZhaoDa-Zhang revised the manuscript. All authors read and approved the final manuscript.