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**Case report**

# Isolated Blunt Pancreatic Trauma: A Case of Spleen Preserving Distal Pancreatectomy and One-Stage Pancreaticoduodenectomy

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## Abstract

Isolated blunt pancreatic injuries are rare. Diagnosis is often delayed due to minimal symptoms and signs. Elevated serum amylase or lipase levels on routine pre-operative laboratory investigations makes pancreatic injury highly likely. Contrast Enhanced CT scan is usually confirmatory.
We are reporting on two patients who presented with blunt abdominal trauma, haemodynamically stable, and with epigastric tenderness. Pre-admission biochemical investigations revealed elevated serum amylase. CECT demonstrated Grade III and Grade IV injuries which were treated with spleen-preserving distal pancreatectomy and pancreaticoduodenectomy, respectively. Post-operatively, both developed amylase-rich fistulae which resolved on conservative management.

**Keywords:** ***pancreatic trauma, isolated blunt pancreatic trauma, spleen preserving distal pancreatectomy, pancreaticoduodenectomy***

## Introduction

Isolated blunt pancreatic trauma is rare. In the rural district hospital setting of South Africa where the hospitals are often manned by junior doctors, the diagnosis is often delayed or missed. The patients often present with pancreatic ascites or pseudocysts. Surgical, intervention is, therefore, often challenging and associated with high morbidity and mortality. When the diagnosis is made timely, the controversy is whether, in stable patients, the surgical approach for Grade III injuries is by distal pancreatectomy with spleen preservation (SPDP), or distal pancreatectomy and splenectomy, two or one-stage pancreaticoduodenectomy for Grade IV and V injuries.

Though controversial, the role of amylase and lipase levels as a component of routine laboratory work-up needs to be explored further for the identification of a likelihood of blunt pancreatic trauma in the resource-limited rural setting manned by junior doctors.

We present our experience at Nelson Mandela Academic Hospital, in the rural Eastern Cape of South Africa of how we diagnose and manage patients with isolated blunt pancreatic injuries.

## Case 1

A 19-year-old woman presented at the Emergency Department with a one-day history of abdominal pain after having been kicked in the upper abdomen. On examination, she was haemodynamically normal with a BP of 110/70 mmHg, Pulse of 90 beats/min. On examination of the abdomen, she had mild generalised tenderness, more marked in the epigastrium and left upper quadrant (LUQ). All other systems were unremarkable. Serum amylase was elevated: 1350 u/l.

Erect Chest XR was unremarkable. Abdominal ultrasound demonstrated peri-splenic fluid collection. We proceeded with contrasted enhanced computerised tomography (CECT) scan of the abdomen which demonstrated Grade III injury (**Fig. 1A**)

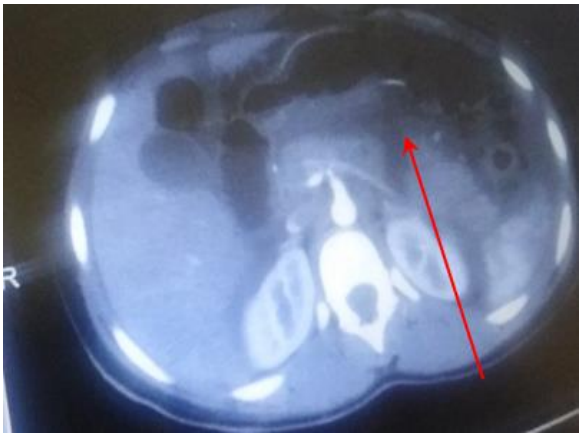

**Figure 1A: CECT illustrating transected body of pancreas (arrow)**

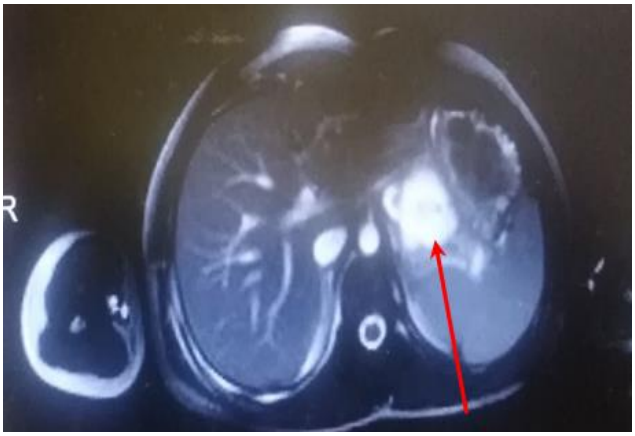

**Figure 1B: MRCP illustrating extravasation of the contrast into the pseudocyst (arrow)**

The patient underwent spleen preserving distal pancreatectomy (SPDP) which was non-eventful. The main pancreatic duct could not be identified intra-operatively. The proximal stump of the pancreas was sutured with a running vicryl 2/0. Post-operatively a sump drain was left in the lesser sac and was removed on postoperative day 10 after it had not been draining for two days. She was discharged on postoperative day 14. On subsequent review, a CECT demonstrated a pancreatic pseudocyst. MRCP demonstrated extravasation of contrast into the cyst (**Fig.1B**). A decision to manage her non-operatively was taken. Subsequent imaging demonstrated a complete resolution of the pseudocyst.

## Case 2

A 29-year-old man presented at the Emergency Department one day after having been involved in a motor vehicle crash as an unrestrained front-seat passenger. He was complaining of vague abdominal pain. On examination, on arrival, he was smelling of alcohol. He was fully orientated without any evidence of head and torso injuries. He had tenderness in the epigastrium. He was hemodynamically normal with a BP of 126/74 and a pulse of 100/min. Erect Chest X-ray was unremarkable. Serum lipase was elevated: 1732 iu/l. All other laboratory investigations were normal except for an elevated white cell count of 14 x 109/ /L. A CECT scan of the Abdomen demonstrated a Grade IV pancreatic injury (**Fig.2A**).

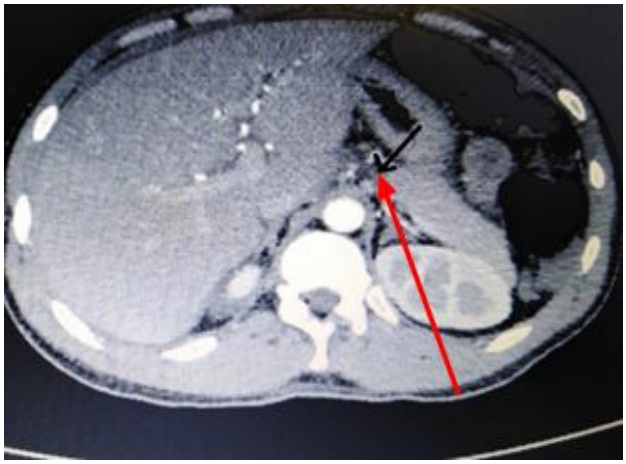

**Figure 2A: CECT depicting Grade IV pancreatic injury (Arrow)**

**Figure 2B: Pancreatico-duodenectomy specimen showing Grade IV pancreatic injury secondary to blunt abdominal trauma**

He was taken to theatre and an uneventful pancreaticoduodenectomy was done (**Fig.2B**). A narrow pancreatic duct was identified. A similarly narrow common hepatic duct (CHD) posed a challenge during the hepatico-jejunostomy stage of the operation. Reconstruction was achieved by pancreatico-gastrostomy and hepatico-jejunostomy. Post-operatively, a sump drain was left in the right sub-hepatic space and a feeding jejunostomy was constructed. He started on jejunostomy feeds on Day 3 post-operatively.

Post-operatively he developed both bile and pancreatic fistulae which resolved spontaneously. He was discharged home six weeks post-operatively. He was seen at OPD two months later whereupon physical examination and abdominal ultrasound demonstrated no abnormality.

## Discussion

The incidence of isolated pancreatic injuries due to blunt abdominal trauma is described in 0.7 to 7% of all abdominal injuries and accounts for 20.9% of all pancreatic injuries [1-4]. These injuries are associated with major morbidity and mortality because of concomitant injuries to the neighbouring major vascular structures and the delay in presentation caused by the retroperitoneal location of the organ [5].

The focus of this report is, therefore, on the timely diagnosis and management of these injuries. A high index of suspicion for pancreatic injury, therefore, must be maintained in all blunt abdominal trauma patients presenting with epigastric pain and tenderness [1]. The role of serum amylase and lipase levels in the diagnosis of blunt pancreatic trauma with main pancreatic duct (MPD) injury has been reported to have conflicting results, with some studies reporting within-normal limit amylase levels, whereas

others have reported constantly elevated amylase levels which may be observed after three hours post-injury [1-7]. In our cases, in routine pre-admission laboratory investigations, the serum amylase and lipase levels were elevated. A mandatory CECT of the abdomen in both cases demonstrated Grade III and IV pancreatic injury.

In our unit further imaging studies such as ERCP or MRCP aimed at demonstrating the status of the MPD recommended by other surgeons [3,8] are not done, as such injuries are presumed from CECT images demonstrating Grade III, IV, and V injuries of the pancreas.

The status of the MPD in these injuries is the main prognostic factor [1]. Non-operative management of low-grade injuries (grade I and II) is the recommended treatment modality and is associated with low (2.4%) mortality and shorter hospital stay. However, in grades III, IV, and V injuries, non-operative management is associated with high mortality and long hospital stay. Therefore, operative intervention is recommended for these injuries[2].

For grade III injuries interventions range from ERCP and stenting for partial disruption of the MPD, distal pancreatectomy with or without spleen preservation, to pancreatico-jejunostomy [6,9,10]. In our unit, we prefer distal pancreatectomy with or without spleen preservation. Spleen preserving distal pancreatectomy (SPDP) was done without complication in our patient who had a sustained Grade III injury. Distal pancreatectomy and splenectomy are advocated by other surgeons as spleen preservation may be associated with unnecessary blood loss, especially in an unstable patient [1]. Buccimazza et al (2006) [3], in their case series of 16 patients reported performing SPDP or pancreatico-jejunostomy with good outcome. The same procedure was performed by Barut, B., Ciftci, F. & Kayaalp, C. (2017) [4] with a similar outcome. In their series of seven patients with Grade III injuries, Chinnery et al (2008) [5] performed either pancreatico-gastrostomy or pancreatico-jejunostomy which they advocate as safer and easier alternatives to SPDP.

For Grade IV and V injuries in most case reports and case series, pancreaticoduodenectomy has been a procedure of choice with variable outcomes [1,6]. The exception is the partial disruption of MPD in Grade IV injuries which may be treated endoscopically with stenting of the MPD [1].

In our experience, both our patients developed pancreatic (amylase-rich) fistulae and an asymptomatic pseudocyst which resolved without intervention in the patient with Grade III injury. The one with Grade IV pancreatic injury developed both biliary and amylase rich- fistula after PD. Pancreatic fistulae and pseudocysts are common after pancreatic surgery. This has been reported in other series by, among others, Buccimazza et al (2006) [9].

## Conclusion

CECT of the abdomen should be done in all stable blunt abdominal trauma patients who otherwise do not need emergency surgery. Though the role of amylase and lipase levels needs further research because of the reported conflicting results, when these are elevated prompt CECT of the abdomen becomes mandatory. In selected stable patients, one-stage PD for Grade IV and V, and SPDP for Grade III pancreatic injuries are feasible and safe.

## List of abbreviations

CECT scan: contrast-enhanced-computarised tomography
ERCP: Endoscopic Retrograde Cholangio-Pancreaticography
MRCP: Magnetic resonant cholangio-pancreaticography
MPD: Major pancreatic duct
SPDP: spleen preserving distal pancreatectomy
PD: Pancreaticoduodenectomy
CBD: common bile duct
CHD: Common hepatic duct

## Ethics Approval

The study was approved by the Walter Sisulu institutional Ethics Research Committee. Clearance number: 105/2021 (annexure 1).

## Conflict of interest

The author declares no conflict of interest regarding the publication of this paper.

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## Authors' contributions

Stephen Molaoa: responsible for patient care, literature search, and case write-up.
Samuel Odunze and Yamkele Desemela: Case 1 care and related literature search.
Mvuyisi Mpikashe and Siyabonga Malongwe: Care of case 2 and related literature search.

## References

[1] Lahiri, R. & Bhattacharya, S., 2013. Pancreatic Trauma. Ann R Coll Surg Engl, Volume 95, pp. 241-245.
[2] Singh, M., Sarawagi, M., Kumar, A. & Kumar, U., 2019. Management of high-grade blunt pancreatic injury; Case report on lesser aggressive approach. International Surgery Journal, 6(5), pp. 1789-1791.
[3] Park, C. L., Park, S. J., Kim, J. H. & Baek, D. H., 2018. Isolated Pancreatic Injury Due to Motorcycle Accident with Endoscopic Treatment: A Case Report. J Acute Care Surgery, 8(2), pp. 74-77.
[4] Siboni, S. et al., 2016. Isolated blunt pancreatic trauma: A benign injury. Journal of Trauma and Acute Care Surgery, 81(5), pp. 855-859.
[5] Lin, B.-C., Chen, R.-J. & Hwang, T.-L., 2019. Lessons learned from isolated blunt major pancreatic injury: Surgical experience in one trauma centre. Injury, Volume 50, p. 152250.
[6] Barut, B., Ciftci, F. & Kayaalp, C., 2017. Spleen preserving distal pancreatectomy in isolated pancreatic trauma. ANNALI ITALIANI DI CHIRURGIA, Volume 6, pp. 1-3.
[7] Laing, G. L., Jeetoo, S. D., Oosthuizen, G. & Clarke, D. L., 2012. AAST grade III pancreatic injury following blunt abdominal trauma. South Africa Journal of Surgery, 50(3), p. 95.
[8] Gupta, A. et al., 2017. Magnitude, Severity, and Outcome of Traumatic Pancreatic Injury at a Level I Trauma Centre in India. Indian J Surg, 79(6), pp. 515-520.Use the "Insert Citation" button to add citations to this document.
[9] Buccimazza, et al., 2006. Isolated main pancreatic duct injuries spectrum and management. The American Journal of Surgery, 191(4), pp. 448-452.
[10] Chinnery, G. E., Thomson, S. R., Ghimenton, F. & Anderson, F., 2008. Pancreatico-enterostomy for isolated main pancreatic duct disruption. Injury, 39(1), pp. 50-56.