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Case Report

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Major abdominal haemorrhage following total pancreatectomy. How late can it be?

William Howden MD, MS[1]; Sam Alhayo MD, MPH[1], Ramesh Damodaran Prabha MBBS, FRACS[1]; Ross Copping MBBS, FRANZCR[2], Yehia El Hgar MBBS, FRANZCR[2, 3]; Amitabha Das FRACS[1]

1. Department of Gastrointestinal Surgery, Liverpool Hospital, NSW, Australia
2. Department of Interventional Radiology, Liverpool Hospital, NSW, Australia
3. Department of Medicine, University of NSW, Australia

Abstract

Introduction: This report presents the second case and most delayed case to-date of a ruptured pseudoaneurysm following-total pancreatectomy. Pseudoaneuryms post-*partial* pancreatoduodenectomy are a rare, but well documented event. A ruptured pseudoaneurysm following *total* pancreatectomy is extremely uncommon, and without a clear pathophysiological mechanism.

Case description: A 60 year old male presents to ED moribund following acute onset abdominal pain, 321 days post total pancreatectomy. A multi-phase CT scan demonstrated a large ruptured pseudoaneurysm in the periportal area. The patient is resuscitated, receiving 16 units of packed red blood cells and the aneurysm is embolised by interventional radiology and makes a full recovery after recovering in intensive care before being discharged two weeks later.

Conclusion: This case highlights the need for the treating doctor to consider post-pancreatectomy haemorrhage in any total pancreatectomy patient, even without remnant pancreatic parenchyma and almost a year post-operatively.

Keywords Pseudoaneurysm, angioembolisation

Introduction

Post-pancreatectomy haemorrhage (PPH) is well documented as one of the leading causes of morbidity and mortality following pancreatic surgery. All but one of the cases available in the English literature are following partial pancreatectomy, and therefore have remnant pancreatic parenchyma [1, 2]. PPH following total pancreatectomy is extremely uncommon and without a clear pathophysiological mechanism. This report presents the second case and most delayed case to-date of a ruptured pseudoaneurysm following-total pancreatectomy.

The International Study Group of Pancreatic Surgery (ISGPS) defines PPH based on three parameters of its onset, site of bleeding, severity and clinical impact into grades of A, B and C [3]. It is more common in the immediate or early post-operative period following subtotal pancreatectomy procedures. Delayed PPH following total

Address for correspondence and reprint requests to:
Liverpool Hospital, 75 Elizabeth St, Liverpool, 2170, NSW
Email address - ramdp27@yahoo.co.uk

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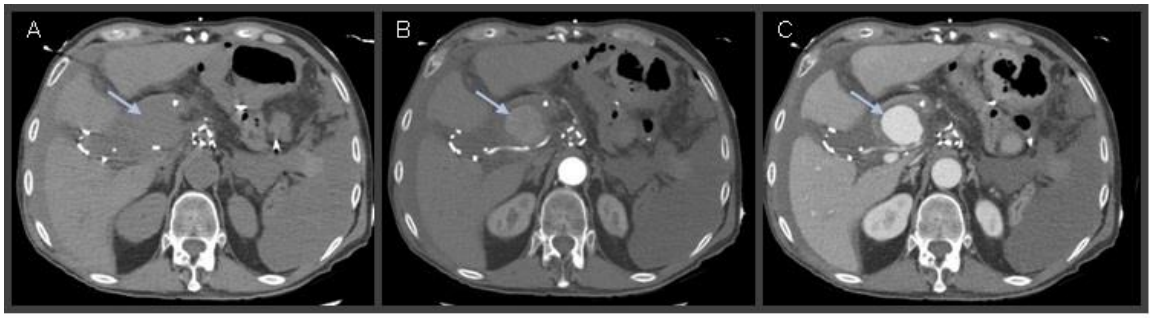

Figure 1 - Axial images of the triple-phase CT scan demonstrating progressive contrast enhancement of the lesion (arrow) across non-contrast (A), arterial (B) and delayed (C) phases

pancreatectomy (TP) is exceptionally uncommon.

Pseudoaneurysms are a common cause of delayed post-operative haemorrhage following pancreatectomy. This occurs secondary to intrabdominal abscesses or pancreatic fistulae causing enzymatic degradation and weakening of the vessel wall [4, 5]. A review of current English literature demonstrates only one example of a comparable case, presenting a presentation of PPH occurring 35 days post completion pancreatectomy [1, 2].

In the case of ruptured pseudoaneurysms, a high index of suspicion and prompt management is paramount to patient survival. Minimally invasive endovascular management, such as that of transcatheter arterial embolisation or placement of an arterial stent is often considered first-line intervention at most centres worldwide [5, 6], and certainly in Australia [4]. Endovascular control of bleeding is associated with a significantly lower rate of mortality than laparotomy (16% vs 37% respectively) [1]. A high index of suspicion is essential to minimise the significant morbidity and mortality associated with PPH.

Case Report

A 60year old male was admitted to an Australian tertiary hospital moribund following acute onset abdominal pain. Notably, 321 days prior he had undergone total pancreatectomy, splenectomy and cholecystectomy for a pancreatic adenocarcinoma at another hospital. His post-operative course was complicated by emergency returns to theatre for a post op haematoma and complete wound dehiscence. He recovered well enough to receive adjuvant chemotherapy, however this was ceased just short of completion due to therapeutic agent intolerance. His post-operative surveillance scan at eight months showed nil disease recurrence.

On presentation to our hospital, the patient was tachycardic with an undetectable blood pressure. Appropriate resuscitation including activation of massive transfusion protocol (MTP) was undertaken. Permissive hypotension was allowed whilst a multi-phase CT scan of his abdomen was performed to demonstrated large volume peritoneal fluid and 37x35mm density at the porta hepatis with progressive contrast enhancement on arterial and delayed phases (Figure 1). These findings were in keeping with a ruptured pseudoaneurysm without confident identification of the feeding vessel.

The patient proceeded to angiography, identifying the vessel as the common hepatic artery (CHA), just proximal to the gastroduodenal stump (Figure 2). The pseudoaneurysm and CHA were embolised with a cast of histoacryl glue and lipiodol emulsion. Repeat angiography demonstrated no residual filling of the pseudoaneurysm and complete embolisation of the CHA (Figure 3)

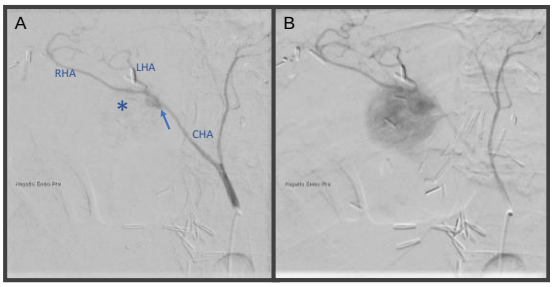

Figure 2 - Pre-embolisation angiogram demonstrating the neck of the pseudoaneurysm (arrow) proximal to the gastroduodenal stump clipsa

No additional feeding vessels via the superior mesenteric artery were identified.

He was transferred to the intensive care unit. A total of 16 units of packed red blood cells with fresh frozen plasma and pooled platelets were received by the end of the procedure at a 1:1:1 ratio, with intermittent haemodynamic instability within the procedure.

The patient's liver function deteriorated briefly, returning to baseline over the following week supported by a N-acetylcysteine infusion. The patient was discharged two weeks after admission without significant morbidity.

Discussion

This case reports a patient with ISGPS C PPH. As discussed previously, it is of great importance to recognise a patient with PPH quickly in the emergency department or ward and to instigate appropriate resuscitation and definitive or temporising management in due course due to its high morbidity and mortality.

The pathophysiology of our encountered pseudoaneurysm is unclear; however, a possible cause could have been a periportal abscess causing weakness and fibrosis of the arterial wall. A microscopic intraabdominal abscess unable to be detected by CT may still have existed. Although less likely, the possibility of recurrence of the malignancy and subsequent vascular wall damage remains a consideration.

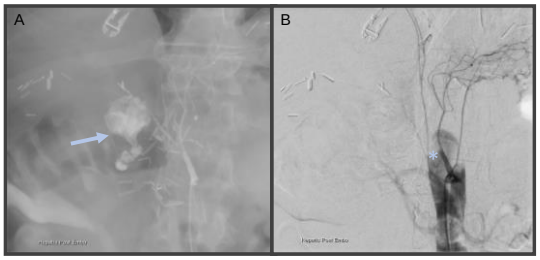

Figure 3 - Post-embolisation angiogram demonstrating successful embolisation of the pseudoaneurysm (arrow) extending into the inferior site of rupture with absence of flow into the proximal common hepatic artery (*)

In the case presented, the decision made by the interventionalist to embolise both the aneurysm and the CHA was multifactorial, primarily due to the risk of rebleed or other nearby feeding vessels. No variant or accessory left hepatic artery was evident on angiography (Figure 2) which suggests tolerance of portal vein perfusion alone

Conclusions

This case presents an extraordinarily rare case of PPH following total pancreatectomy. It is only the second case [3] of its kind reported in the literature and presents the longest reported interval between index operation and haemorrhage at 321 days. Pseudoaneurysm and rupture should be an important differential in any post-pancreatectomy patient presenting with haemodynamic instability, even in the absence remnant parenchyma.

Learning points

- Post-pancreatectomy haemorrhage (PPH) is a rare event, but carries significant morbidity and mortality
- PPH is usually associated with remnant pancreatic parenchyma and pancreatic fistula formation
- For the post-pancreatectomy patient presenting with signs of shock, even in the absence of remnant pancreatic parenchyma (i.e., following total pancreatectomy), a high index of suspicion

for PPH should remain

- Angioembolisation is an effective first-line management strategy in most cases of PPH.

Consent

Written informed consent for publication of this case and accompanying images was obtained from the patient

Competing interests

The authors declare that there are no competing interests

Authors' contributions

WH carried out the literature search, draft of manuscript and editing of manuscript. **SA** carried out editing of the manuscript and clinical management of the patient. **RC** and **YE** carried out clinical management of the patient and input and editing of the manuscript. **AD** supervised and edited the manuscript. All authors read and approved the final version for publication.

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