



The Endovascular Management of a Conduit Pseudoaneurysm in a Viable Allograft

Alfawaz A*, Kenel-Pierre S, Lacayo CM, Rey J, Jones K and Robinson H

Department of Surgery, University of Miami School of Medicine, USA

Abstract

Vascular complications following multivisceral transplantation is increasingly being reported in the literature. Among transplants, composite allografts are particularly at risk of developing pseudoaneurysms with or without a non-occlusive thrombus. Although historically open surgery was the only option in repair of pseudoaneurysms, the present day widespread adoption of endovascular techniques has significantly expanded our armamentarium. We present case of a patient with a hostile abdomen and pseudoaneurysm of the donor aorta that was excluded successfully following endovascular intervention.

Keywords: Allograft; Transplant; Pseudoaneurysm; Aorta; Endovascular repair

Introduction

Vascular complications following multivisceral transplantation are increasingly being reported in the literature, likely secondary to the combination of field contamination, malnutrition and immunosuppression. Among transplants, composite allografts are particularly at risk of developing pseudoaneurysms with or without a non-occlusive thrombus. This issue is further complicated by the complex anatomy of these transplant patients and the “hostile abdomen” attributed to their numerous previous operations. Although historically open surgery was the only option in repair of pseudoaneurysms, the present day widespread adoption of endovascular techniques has significantly expanded our armamentarium [1]. We present a case of a patient with a hostile abdomen and pseudoaneurysm of the thoracic donor aorta excluded successfully following endovascular intervention.

OPEN ACCESS

*Correspondence:

Abdullah Alfawaz, Department of Surgery, University of Miami School of Medicine DeWitt Daughtry Family, Surgical Education Office, Holtz Center 2169, Miami, FL 33136, USA, E-mail: abdullah.alfawaz@jhsmiami.org

Received Date: 22 May 2016

Accepted Date: 23 Jun 2016

Published Date: 28 Jun 2016

Citation:

Alfawaz A, Kenel-Pierre S, Lacayo CM, Rey J, Jones K, Robinson H. The Endovascular Management of a Conduit Pseudoaneurysm in a Viable Allograft. *Clin Surg*. 2016; 1: 1035.

Copyright © 2016 Alfawaz A. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Case Presentation

The patient is a 49-year-old male with a history of alcohol abuse and cirrhosis who developed necrotizing pancreatitis and gangrenous cholecystitis complicated by multiple enterocutaneous fistulae requiring several operations. This left the patient with short bowel syndrome, TPN dependence, and eventually liver failure. He underwent a multivisceral transplant one year prior with a composite allograft (stomach, duodenum, pancreas, small bowel, colon, and liver). The operation was complicated by dense intra-abdominal adhesions leading to multiple enterotomies and a significant intra-operative blood loss of 8 liters. After anastomosing the allograft, the patient was packed and sent to the ICU to reverse his coagulopathy and was brought back to the operating room within 48 hours to re-evaluate for hemostasis and closure. Four months post-operatively, the patient developed an intra-abdominal collection that was treated with percutaneous drainage. One year later, he was diagnosed with an enterocutaneous fistula, and subsequently had a CT to assess for additional intra-abdominal fluid collections.

The CT of the abdomen/pelvis demonstrated the fistula as well as a pseudoaneurysm of donor aorta with a diameter of 0.86cm, located approximately 2.4cm from the aorto-aortic anastomosis (Figure 1 and 2). Considering the proximity of the pseudoaneurysm to his visceral vessels including the SMA and the donor aortic anastomoses, vascular surgery was consulted. Given the significant surgical history and risk of contamination from the enterocutaneous fistula, we elected to proceed with an endovascular approach after obtaining negative blood cultures.

Following open exposure of the right common femoral artery, percutaneous access was obtained at the contralateral groin. Several aortograms were performed, identifying the infrarenal donor vessel anastomosis and the pseudoaneurysm in relation to mesenteric vasculature. Distal angiogram from within the donor thoracic aorta was able to adequately visualize the exact origin of the celiac and SMA in relation to the pseudoaneurysm. Via the contralateral groin, stiff Glidewires (Terumo



Figure 1: Demonstrates the pseudoaneurysm of the donor aorta allograft.



Figure 3: Angiographic image following deployment of the stent-graft with stiff Glidewires in the donor celiac trunk and SMA.



Figure 2: Another view of the pseudoaneurysm of the donor aorta allograft.



Figure 4: CT reconstruction demonstrating successful exclusion of the pseudoaneurysm 1 year later.

Interventional Systems, Tokyo, Japan) were advanced into the celiac trunk and SMA, in preparation for endovascular salvage in the setting of stent-graft maldeployment.

A stiff Glidewire was advanced to the level of the descending thoracic aorta and exchanged for a Lunderquist (Cook Medical Incorporated, Bloomington, IN, USA) wire using an angled Glidecath. An 18fr DrySeal sheath (W.L. Gore, Flagstaff, AZ, USA) was advanced over the wire and into the aorta. The Lunderquist wire was then exchanged for a stiff-angled glidewire and placed into the blind ending donor aorta. A Gore 23mmx3.3cm aortic cuff device was advanced into the donor aorta and successfully deployed distal to the aortic anastomosis and proximal to the mesenteric vessels, excluding the pseudoaneurysm (Figure 3).

The patient had an uncomplicated immediate peri-operative period and was discharged home. CT scan at one-year follow-up showed successful exclusion of the pseudoaneurysm (Figure 4).

Discussion

The endovascular management of transplant-associated pseudoaneurysms is not a novel concept. As Ginat et al. [2] have shown, these techniques have been applied to liver transplant patients who develop supraceliac pseudoaneurysms. Open repair of these lesions, although possible, are often difficult, lengthy cases, secondary to significant adhesions and inflammation. Shukla et al.

[3] recent study demonstrated that mortality rates are increased with the open management of visceral aneurysms. Accordingly, when discussing the management of multi-visceral transplant-associated pseudoaneurysms, an endovascular approach is not only preferable; it should be the standard.

Pseudoaneurysm rupture remains one of the most fatal complications in the multivisceral transplant population. Few reports have demonstrated the successful endovascular management of pseudoaneurysms in this particular cohort, with no reported case involving a viable conduit. In this case report, we present the successful stent-grafting of the donor thoracic aorta pseudoaneurysm with preservation of antegrade flow through the mesenteric vasculature.

There are several aspects to our patient’s immediate postoperative course that may have predisposed him to pseudoaneurysm formation. Beyond the operative blood loss and OR time during the index procedure, our patient returned 36 hours later for removal of intra-abdominal packs left for hemostasis. A lengthy postoperative course in the ICU complicated by intra-abdominal fluid collections and enterocutaneous fistulae requiring multiple surgical revisions certainly contributed to intra-abdominal contamination. Fortunately, he presented with an intact pseudoaneurysm and negative blood cultures, affording us the opportunity to plan our approach.

Conclusion

The endovascular approach for management of transplant associated pseudoaneurysms is gaining popularity and will be the standard approach for dealing with these post-operative complications. Patients should be evaluated with angiograms for favorable anatomy, and systemic infection has to be ruled out in the event a foreign body is to be placed in this immunosuppressed population. Considering the variant anatomy, dense adhesions, possibility of intra-abdominal contamination, lack of healing potential, and the overall frail nature of these transplant patients, endovascular therapeutic techniques provide a safer alternative to open repair with a lower immediate morbidity and mortality [3].

References

1. Amesur NB, Zajko AB, Costa G, Abu-Elmagd KM. Combined surgical and interventional radiologic management strategies in patients with arterial pseudo-aneurysms after multivisceral transplantation. *Transplantation*. 2014; 97: 235-244.
2. Ginat DT, Saad WE, Waldman DL, Davies MG. Stent-graft placement for management of iatrogenic hepatic artery branch pseudoaneurysm after liver transplantation. *Vasc Endovascular Surg*. 2009; 43: 513-517.
3. Shukla AJ, Eid R, Fish L, Avgerinos E, Marone L, Makaroun M, et al. Contemporary outcomes of intact and ruptured visceral artery aneurysms. *J Vasc Surg*. 2015; 61: 1442-1448.