Spontaneous migration of thrombosed synthetic vascular graft to the duodenum after living-donor liver transplantation: A case-report

Ahmed Mohamed Sultan, Ahmed Shehta*, Tarek Salah, Mohamed Elshoubary, Mohamed Abdel Wahab

Liver Transplantation Unit, Gastrointestinal Surgery Center, College of Medicine, Mansoura University, Egypt

Abstract

INTRODUCTION: Spontaneous migration of synthetic grafts had been described after abdominal vascular procedures into the duodenum and small bowel. In the setting of liver transplantation, synthetic grafts are commonly used for overcoming shortened or poor-quality vasculatures. We describe a case of spontaneous migration of thrombosed synthetic vascular graft after living-donor liver transplantation (LDLT).

PRESENTATION: A 59 years male patient with end stage liver disease underwent LDLT utilizing a right hemi-liver graft. Drainage of segment V vein was done to inferior vena cava using a vascular graft. Graft patency was confirmed by regular follow up doppler ultrasound. Graft thrombosis was detected on the 4th postoperative month.

The patient developed anastomotic biliary stricture 3 months after LDLT, which required repeated endoscopic retrograde cholangio-pancreatography (ERCP).

During an ERCP set two and half years after LDLT, the thrombosed graft was seen eroding into the first part of the duodenum. The patient was generally stable and the decision was to follow up the condition.

Follow up computed tomography showed disappearance of the graft from the abdomen, and endoscopy revealed a small ulcer at the site of the migrated graft.

DISCUSSION: Reports regarding spontaneous migration of synthetic grafts in this setting of LDLT are extremely rare. We report a rare case of spontaneous migration of thrombosed synthetic vascular graft into the duodenum after LDLT.

CONCLUSION: We report a rare case of spontaneous migration of thrombosed synthetic vascular graft into the duodenum after LDLT.

© 2018 Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Spontaneous migration of synthetic grafts had been described after abdominal vascular procedures as inferior vena cava (IVC) replacement, porto-caval, and meso-caval shunts into the duodenum and small bowel [1–3].

Living donor liver transplantation (LDLT) has been a useful therapeutic option for end-stage liver disease because of the shortage of deceased donor liver grafts [4]. In the setting of liver transplantation, synthetic grafts are commonly used for overcoming shortened or poor-quality vasculatures of liver donors and/or recipients.

Reports regarding spontaneous migration of synthetic grafts in this setting is extremely rare. We report a case of spontaneous migration of thrombosed synthetic vascular graft after LDLT into the duodenum. This work has been reported in line with the SCARE criteria [5].

2. Case presentation

A 59 years old male patient with end stage liver disease due to chronic hepatitis C virus infection underwent living donor liver transplantation utilizing a right hemi-liver graft from his son. The graft weight was 834 gm, with graft to recipient weight ratio (GRWR) 0.88.

Right hepatic vein reconstruction was done by end-to-side anastomosis between donor right hepatic vein (30 mm in diameter) and IVC using continuous 4/0 polypropylene sutures with venoplasty. Drainage of segment V vein (5 mm) was done to side of IVC using

References

Abbreviations: GRWR, graft to recipient weight ratio; IVC, inferior vena cava; PTFE, polytetra-fluoroethylene; US, ultrasound; ERCP, endoscopic retrograde cholangio-pancreatography.

* Corresponding author at: Liver Transplantation Unit, Gastrointestinal Surgery Center, College of Medicine, Mansoura University, Gehan Street, Postal code, 35516, Egypt.

E-mail addresses: ahmedshehta@mans.edu.eg, dr_ahmedshehta@yahoo.com (A. Shehta).

https://doi.org/10.1016/j.ijscr.2018.03.013
2210-2612/© 2018 Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
an externally supported polytetra-fluoroethylene (PTFE) synthetic vascular graft (Gore-Tex 6 mm in diameter) by 4/0 polypropylene sutures (posterior continuous sutures and anterior interrupted sutures). In Egypt, there are no available cryopreserved grafts from cadavers.

Reconstruction of the portal vein was done by end-to-end anastomosis between donor right portal vein (8 mm in diameter) and recipient main portal vein (12 mm in diameter) using continuous 5/0 polypropylene sutures.

Reconstruction of the hepatic artery was done by end-to-end anastomosis between donor right hepatic artery (2 mm in diameter) and recipient right hepatic artery (4 mm in diameter) using interrupted 8/0 polypropylene sutures.

Doppler ultrasound (US) examination was done after completion of vascular anastomoses and at the end of operation which confirmed patency of all vascular anastomoses.

Two biliary anastomoses were done for biliary reconstruction between donor right posterior sectorial duct (3 mm in diameter) and right anterior sectorial duct (3 mm in diameter) to recipient left hepatic duct (4 mm in diameter) and right hepatic duct (4 mm in diameter), respectively. Biliary reconstruction was done by interrupted polydioxanone (PDS) 6/0 sutures over two trans-biliary stents.

Doppler US was performed daily in the first postoperative week to evaluate patency of vascular anastomoses, and twice weekly afterwards till patient discharge. The patient had smooth postoperative course, and was discharged without complications. The patient was scheduled to regular follow up through regular outpatient clinic visits (including clinical, laboratory, and Doppler US examinations).

The patient developed anastomotic biliary strictures, in both biliary anastomoses, 3 months after transplantation, which required repeated sets of endoscopic retrograde cholangio-pancreatography (ERCP). ERCP cholangiogram confirmed the presence of anastomotic stricture that required endoscopic graduated balloon dilatation and stenting.

Follow up Doppler US was done regularly to confirm patency of vascular anastomoses. No vascular abnormalities were detected apart from thrombosis of segment V vein, which was detected in the fourth postoperative month (Fig. 1).

During an ERCP set that was done two and half years after transplantation, the thrombosed synthetic vascular graft was seen eroding into the first part of the duodenum (Fig. 2). The procedure was completed and balloon dilatation of the anastomotic stricture and re-stenting was done. The patient was generally stable and the decision was to follow up the condition of the eroding synthetic vascular graft.

A computed tomography was done 1 week later and showed disappearance of the synthetic vascular graft from the abdomen. Follow up endoscopy afterwards revealed a small ulcer in the first part of the duodenum at the site of the migrated synthetic vascular graft with no other abnormalities.

3. Discussion

Spontaneous migration of synthetic grafts had been described after abdominal vascular procedures as IVC replacement, porto-caval, and meso-caval shunts into the duodenum and small bowel [1-3]. Most of these cases presented with emergency situations such as intra-abdominal sepsis, hematemesis and melena, and intestinal obstruction necessitating emergency intervention.

In the setting of liver transplantation, synthetic grafts are commonly used for overcoming shortened or poor-quality vasculatures of donors and/or recipients. Synthetic grafts are used mainly for reconstruction of anterior sector veins of right hemi-liver grafts, portal vein, and less commonly arterial reconstruction. Reports regarding spontaneous migration of synthetic grafts in this setting are extremely rare. Recently, Esposito et al. [4] reported the
first case of spontaneous migration of a mesenterico-portal PTFE graft to the stomach following cadaveric liver transplantation. This required emergent exploration and removal of the thrombosed graft and repair of the stomach. Hscu et al. [7], recently reported migration of infected thrombosed PTFE to the duodenum and LDLT in 3 cases. This increases the risk of mortality due to impending perforation and subsequent risk of sepsis. Those cases also required surgical exploration and extraction of the thrombosed graft.

In this report, we describe a rare case of spontaneous migration of thrombosed synthetic vascular graft after LDLT. Migration was diagnosed endoscopically during an ERCP set for anastomotic biliary stricture. The patient did not have any emergency situation like intra-abdominal sepsis or bleeding or intestinal obstruction, and the decision to observe and follow up the patient was wise enough to avoid unnecessary surgical exploration. Spontaneous expulsion of the migrated vascular graft from the digestive tract occurred without any complications.

The real mechanism for the migration of the thrombosed graft is not fully understood. We think that repeated ERCP sets for the management of anastomotic biliary stricture and repeated stent placements may play the major role in synthetic graft thrombosis and subsequent migration into the first part of the duodenum. Hscu et al. [7] hypothesize that the acute thrombotic occlusion of the vascular graft increases the perigraft inflammation which increases the process of adhesion of the graft to adjacent organs, such as the stomach and the duodenum, which may potentiate the graft migration.

Some reports have described prophylactic methods to avoid such complications as placement of native tissue such as omentoplasty at the surgery field separating the graft from the surrounding stomach and bowel [6]. Such practice was not routinely done in our liver transplant recipients before this case report.

Finally, to the best of our knowledge, reports describing spontaneous migration of thrombosed synthetic vascular graft after LDLT are extremely rare. We report a rare case of spontaneous migration of thrombosed synthetic vascular graft into the duodenum after LDLT.

**Conflicts of interest**

No conflicts of interest were declared.

**Funding**

No external funding resources.

**Ethical approval**

This case report was accepted by the local ethical committee.

**Consent**

We obtained a written informed consent from the patient for the publication of this case report and accompanying images. A copy of this written consent is available for review by the editor-in-chief of the International Journal of Surgery Case Reports on request.

**Author contribution**

Conception and design of the study: Shehta A, Sultan AM, Wahab MA.

Collection and assembly of the data: Shehta A, Sultan AM.

Data analysis and interpretation: Shehta A, Sultan AM, Wahab MA.

Drafting the manuscript: All authors.

**Guarantor**

Mohamed Abdel Wahab, Ahmed Shehta.

**Acknowledgments**

None.

**References**

[1] S. Samaullah, K. Kim, E. Yoon, et al., What goes in should not always come out: migration of a prosthetic mesocaval shunt via erosion through the duodenum, Gastrointest. Endosc. 81 (May 1 (5)) (2015) 1298–1299.

[2] S.S. Rana, A. Behera, N. Kalra, et al., Spontaneous migration of a prosthetic mesocaval shunt to the duodenum: endoscopic diagnosis of an unusual complication of shunt surgery, Gastrointest. Endosc. 70 (August 31 (2)) (2009) 387–389.

[3] V. Guru, O.D. Rotstein, Small bowel obstruction due to intestinal migration of an inferior vena cava polytetrafluoroethylene graft, Surgery 131 (April 3 (4)) (2002) 465–467.

[4] S. I. Eguchi, M. Takatsuki, M. Hidaka, et al., Evolution of living donor liver transplantation over 10 years: experience of a single center, Surg. Today 38 (2008) 795–800.

[5] R.A. Agha, A.J. Fowler, A. Saeta, et al., The SCARE Statement: consensus-based surgical case report guidelines, Int. J. Surg. (September 6) (2016), http://dx.doi.org/10.1016/j.ijsu.2016.08.014.

[6] F. Esposito, C. Lim, C. Salloum, et al., Intragastrectomy migration of a mesentericoportal polytetrafluoroethylene jump graft after liver transplantation, Liver Transpl. 23 (May 1 (5)) (2017) 696–697.

[7] S.C. Hsu, A. Thorat, H.R. Yang, et al., Assessing the safety of expanded polytetrafluoroethylene synthetic grafts in living donor liver transplantation: graft migration into hollow viscous organs—diagnosis and treatment options, Med. Sci. Monit. 23 (2017) 3284–3292.