



Spontaneous and uneventful anal expulsion of expanded polytetrafluoroethylene (e-PTFE) vascular graft after living donor liver transplantation

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ABSTRACT

Living donor liver transplantation (LDLT) is a useful therapeutic option for end-stage liver disease due to the shortage of deceased donor liver grafts, particularly in Asia and Türkiye. Right liver LDLT is frequently performed in adults and some cases require anterior section venous drainage. Synthetic grafts, particularly expanded polytetrafluoroethylene (e-PTFE), are often preferred for venoplasties. Despite its many advantages, some complications associated with these grafts have been reported, such as gastrointestinal tract migration, perforation, and bleeding. Here we present an extremely rare case about an e-PTFE graft.

Keywords: Liver transplantation, venous drainage, venoplasty, vascular graft, complication

INTRODUCTION

Living donor liver transplantation (LDLT) has been a useful therapeutic method for end-stage liver disease due to the shortage of deceased donor liver grafts (1). Right liver LDLT (RLDLT) is frequently performed in adults (2). In RLDLT procedures, it is preferred to keep the middle hepatic vein on the donor side to protect venous drainage of donor segment 4's venous drainage. Thus, drainage of large-diameter veins (>5 mm) of segment 5 and 8, must be reestablished. Also, in some cases, large inferior hepatic veins draining segment 6 or segment 7 require reconstruction for venous drainage due to the same reason (3,4). Various venoplasty techniques can be applied utilizing autologous or synthetic vascular grafts (5-7). When compared to autologous grafts, synthetic grafts are easy to obtain, less time-wasting, and satisfying (5-9). Consequently, synthetic grafts, particularly expanded polytetrafluoroethylene (e-PTFE) (Gore Tex®, W.L. Gore & Associates, Inc. Medical Products Division Flagstaff, Arizona, USA), have been more often preferred for venoplasties. Although e-PTFE grafts have many advantages, some rare complications such as gastrointestinal migration, penetration and bleeding have also been reported. Here we report an unusual case, in which an e-PTFE graft totally and uneventfully passed through the gastrointestinal tract and was excreted anally.

CASE REPORT

A 30-year-old female patient with end stage liver disease due to primary sclerosing cholangitis, underwent RLDLT in 2011. The living liver donor was her husband and according to our laws it was officially allowed. Six millimeter (mm) segment 5 vein, which was draining to the donor's middle hepatic vein, was reconstructed by means of an 8 mm diameter e-PTFE graft during the back table procedure. This graft was anastomosed to the inferior vena cava (IVC). Thus, segment 5 venous drainage to the IVC was reestablished via e-PTFE vascular graft. Graft patency was confirmed

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by regular follow-up Doppler ultrasonography. The patient was discharged uneventfully, and regular follow-up was continued. Graft thrombosis was detected on abdominal computed tomography (CT) on the 3rd postoperative month (Figure 1, yellow arrows).

Eight years after surgery, the patient was admitted to the transplantation outpatient clinic because of a tubular-shaped foreign body in her stool. The examination revealed that the foreign body was an e-PTFE vascular graft, which was used in the LDLT surgery (Figure 2). The patient did not describe any gastrointestinal system complaints. The patient indicated that she applied to a local hospital due to slight abdominal pain before she came to us, where she underwent an abdominal CT. We investigated these CT scans and realized that the e-PTFE graft was transmigrated to the patient's duodenum without complication (Figure 1, red arrows). We performed a novel CT to assess any abdominal pathology resulting from vascular graft migration. No problems were detected in the gastrointestinal system or in IVC (Figure 1). The vascular graft, which was obviously seen in the previous CT, was not observed in this new study. This proved that the graft was rejected by the body. There were no further remarkable findings in the CT. Also, no traumatic changes or signs of complications were detected in endoscopic examinations. Apparently, e-PTFE graft was

completely transmigrated through the gastrointestinal tract and excreted through the anus without causing any complications. Patient did not have any complaints, and she continued her routine outpatient clinic follow-up.

DISCUSSION

In RLLDT LDLT, veins other than right hepatic vein which size bigger than 5 mm in graft side must be drained to recipients IVC directly or by way of grafts (9). Recently, e-PTFE synthetic vascular grafts are mostly preferred for this purpose due to its many advantages (5-9). Main complications regarding e-PTFE vascular grafts are infection and thrombosis, but they develop rarely. Also, it is clinically sufficient for the e-PTFE grafts to remain open for 2 weeks (3,5,10,11), thus late thrombosis of e-PTFE grafts have been shown no effect on survival. The use of e-PTFE grafts has proven to be reliable in LDLT (3,5).

Spontaneous migration of thrombosed synthetic grafts to the duodenum or the small bowel has been reported after abdominal vascular surgeries (12,13). However they are unusual, some complications such as penetration, perforation, obstruction, fistulization and bleeding can occur in the long-term period due to graft migration (3,12,13). The first reported case was e-PTFE vascular graft migration to the stomach following a deceased donor liver transplantation. Graft migration caused stomach perforation and required urgent surgery (14). Similarly, Hsu et al. (4) reported 3 duodenal perforation cases due to e-PTFE vascular graft migration that necessitated immediate abdominal exploration after LDLT. The first spontaneous and uneventful migration of a thrombosed e-PTFE graft to the duodenum 3 months after LDLT was reported by Sultan et al. (15). In that case, thrombosed e-PTFE graft, eroding the first

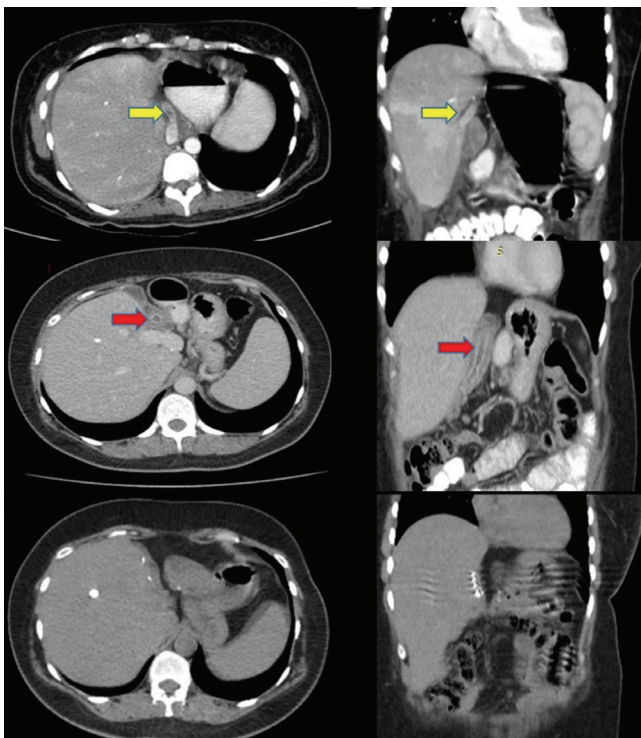


Figure 1. Thrombosis in vascular graft on the 3rd postoperative month. Computed tomography, coronal and axial views (yellow arrows). Vascular graft transmigration into duodenum (red arrows). Vascular graft was not seen in the new computed tomography.



Figure 2. Expulsed expanded polytetrafluoroethylene vascular graft after defecation.

part of the duodenum, was seen during ERCP. There was no remarkable duodenal wall destruction or perforation, and patients were stable. They did not perform any intervention for this, only followed up on the condition. Follow-up CT showed disappearance of the graft from the abdomen, and endoscopic examination revealed a small ulcer at the site of the migrated graft. Probably the graft was excreted via the anal route.

In our case, the patient brought the e-PTFE vascular graft, which was used in LDLT, after observing it in her stool. This was an extremely odd, and, according to our knowledge, the first entity in the literature regarding e-PTFE vascular graft migration. Fortunately, no complication occurred regarding this complete and uneventful graft migration after the follow-up period.

CONCLUSION

Although synthetic vascular grafts such as e-PTFE are useful and reliable materials for venoplasties in LDLT, they may lead to some potential complications. Particularly in the long term, after surgery, surgeons must be careful about complications due to graft migration to the gastrointestinal tract. In case of doubt, patients should be evaluated with CT and endoscopy immediately.

Ethics

Informed Consent: Informed consent was obtained from the patient who participated in this study.

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Footnotes

Author Contributions

Concept - T.E., T.Ü., C.A., M.B.S.; Design - T.E., T.Ü., C.A., M.B.S.; Supervision - T.Ü., F.O., M.A., İ.A.; Data Collection or Processing - T.E., T.Ü., C.A., M.B.S., M.Ö., C.A.; Analysis or Interpretation - T.E., T.Ü., C.A., M.B.S., M.Ö., C.A.; Literature Search - T.E., T.Ü., C.A., M.B.S., M.Ö., C.A.; Critical Review - T.E., T.Ü., C.A., F.O., M.A., İ.A.; Writing - T.E., T.Ü., C.A., M.B.S.

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