Liver Transplant Portal Vein Stenosis: Long Term Follow Up of Angioplasty and Stent Placement

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Background

- Portal vein stenosis (PVS) is a rare complication of liver transplant recipients occurring in 0.3-3.7%.
- Can occur in the perioperative period or many years later.
- The majority of PVS occur six months after transplant surgery, secondary to postoperative scarring/fibrosis and neointimal hyperplasia.

Purpose

To investigate patency of percutaneous transhepatic **angioplasty** and/or **stenting** of portal vein (PV) stenosis in adult liver transplant (LT) recipients.

Clinical Features/Sequela of PVS

Ascites	Graft Rejection
Variceal Bleeding	Graft Failure
Abnormal LFTs	Sepsis

Materials and Methods

A single-institution, retrospective study of patients treated between December 2000 to September 2021. From a total of 3387 deceased donor and living donor liver adult transplant (2533 DDLT and 854 LDLT) recipients, 13 were treated for clinically significant portal vein stenosis (PVS) with percutaneous transhepatic angioplasty and/or stenting. The primary endpoint was primary patency, compared between groups. Secondary endpoints included time to first intervention, time to recurrent stenosis, technical success, clinical success, and complications.

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Angioplasty

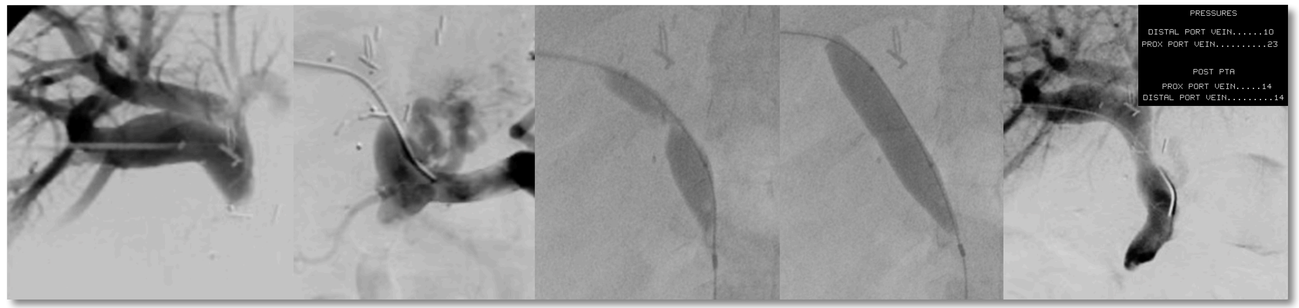

Figure 1: Successful angioplasty of portal vein stenosis with 14 mm diameter x 40 mm length Atlas balloon. Pre venoplasty gradient measured 13 mmHg and post venoplasty gradient measured 0 mmHg.

Results

- 13 patients with post-liver transplantation PVS (10 DDLT, 3 LDLT) underwent **primary angioplasty** (n=8) or **primary stenting** (n=5).
- Median time from LT to intervention was 7 months (range 2-29) for the angioplasty group and 6 months (range 4-65) for the stenting group.
- PVS was detected on pre-procedure imaging in all patients.
- The etiology of PVS was anastomotic stricture (n=11) and tumor recurrence (n=2).
- Primary patency was 100% for the angioplasty group and 80% for the stenting group.
- Technical success rate was 100%. Clinical success rate was 88% and 80% for angioplasty and stenting respectively.
- No PV thrombosis occurred in either group.
- No reinterventions were required in the stenting group.
- 4 of 8 patients in the angioplasty group required repeat angioplasty (n=2) or stenting (n=2).
- Median time to repeat intervention was 8 months (0-13).
- Clinical success in the repeat intervention group was 100%.
- There was one major complication (< 30) days in the stenting group resulting in hemothorax requiring chest tube placement.

Key Words

LT = liver transplant, PV = portal vein, PVS = portal vein stenosis, LDLT = living donor liver transplantation, DDLT = deceased donor liver transplant, PHT = portal hypertension

Stenting

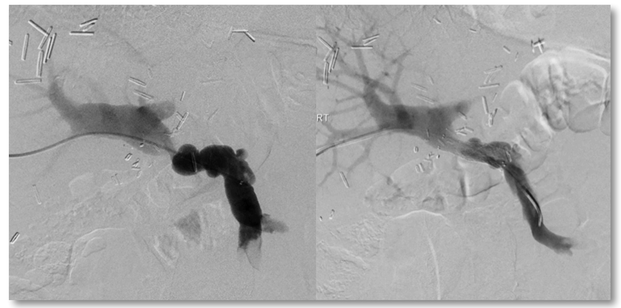

Figure 2 a): Successful stenting of portal vein stenosis with 12 mm diameter x 40 mm length Epic self expanding stent. This was followed by post dilation with a 10 mm diameter x 40 mm length Mustang balloon (not shown).

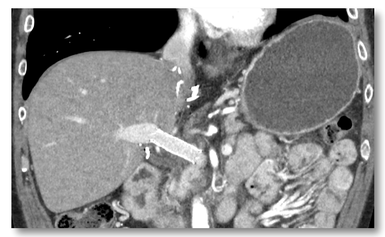

Figure 2 b): Follow up CT of the same patient demonstrates patent portal vein and stent status post stenting with 12 mm diameter x 40 mm length Epic self expanding stent.

Conclusion

- Percutaneous transhepatic PV angioplasty and stenting have a high technical success rate and favorable long-term patency.
- Despite shorter interval follow up for the stenting group, primary stenting for PVS is a durable approach which reduces the need for re-intervention.

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