

Accuracy of Doppler Ultrasound for Covered TIPS

The Problem

- Transjugular Intrahepatic Portosystemic Shunts (TIPS) have provided a life altering and life-saving treatment for patients with symptomatic portal hypertension.
- TIPS were first placed with uncovered metal stents, which had high rates of stenosis and occlusion leading to practice of routine ultrasound screening for TIPS malfunction.
- TIPS are now placed with polytetrafluoroethylene (PTFE) covered stents that have significantly higher patency rates compared to uncovered TIPS.
- Ultrasound criteria for TIPS evaluation are based on data from uncovered TIPS.
- The accuracy and need of ultrasound surveillance for covered TIPS have been questioned.
- As an academic and liver transplant center, BIDMC cares for a large population of patients with end stage liver disease (ESLD) and portal hypertension.
- Studying the accuracy of ultrasound in examining for covered TIPS malfunction will assess what role, if any, ultrasound plays in covered TIPS evaluation.
- Such knowledge will lead to more effective care for TIPS patients as well as efficient use of resources.

Aim/Goal

The goal of our study was to assess the predictive value and accuracy of Doppler ultrasound in the evaluation of covered TIPS, to evaluate the role of Doppler ultrasound in covered TIPS management, and to characterize factors contributing to inaccuracy of TIPS ultrasound in evaluating covered TIPS patency.

The Team

- Ultrasound Division – Department of Radiology
- Interventional Radiology

The Interventions

- Patients who underwent TIPS revision or venography from 1/1/2005-12/31/2013 and who had TIPS placed at BIDMC and were evaluated by ultrasound were reviewed.
- Ultrasound results were compared with venography for accuracy regarding TIPS patency, stenosis, and occlusion.

The Results/Progress to Date

Covered TIPS Ultrasound for TIPS Malfunction (n=360)

Sensitivity	Specificity	Accuracy	False Positive	False Negative
85%	98%	97%	6	5

Covered TIPS malfunctions

34

Asymptomatic Covered TIPS malfunctions

16 (47%)

5 of 16 occluded at venography

Lessons Learned

We found ultrasound to be an accurate method to evaluate for covered TIPS malfunction.

We also found surveillance of covered TIPS in asymptomatic patients has a role in patient management due to the discovery of malfunctioning covered TIPS in asymptomatic patients.

Review of the false positive and false negative ultrasound examinations has provided valuable sources of improvement in examination performance and examination interpretation.

Next Steps/What Should Happen Next

- Review the small number of false positive and false negative ultrasound examinations with sonographers and radiologists to attempt to decrease the small number of false positive and false negative ultrasound examinations.
- Ultrasound data should be further analyzed to evaluate if optimal criteria for covered TIPS malfunction differ from previously published uncovered TIPS data.
- Findings to be published in the scientific literature to advance covered TIPS evaluation.