

Procedure Overview

Insertion of a low-resistance percutaneous shunt between the **portal venous system and hepatic vein** to decompress portal hypertension. Goal hepatic venous pressure gradient is < 12mmHg.

Indications:

- Variceal hemorrhage refractory to medical/endoscopic therapy
- Refractory ascites or hepatic hydrothorax
- Portal vein thrombosis or Budd-Chiari syndrome

IR access sites: RIJ > LIJ > Femoral. Difficult cases may require multiple access sites.

Anesthetic Summary

Category	Recommendation
Anesthetic type	General anesthesia
Premedication	Avoid benzodiazepines (can precipitate/worsen encephalopathy) *If periprocedural large-volume paracentesis (> 4-5L) is performed, consider albumin replacement ~6–8 g/liter removed
Airway	ETT; RSI if aspiration risk (active/recent GI bleed, ascites, encephalopathy)
Lines & access	Two large-bore PIVs minimum; Consider central access (often placed by IR)
Labs	CBC, CMP, PT/INR, PTT, Fibrinogen Goal INR ≤1.8 Goal Platelets ≥ 50,000 *Reverse significant coagulopathy when <i>clinically</i> indicated
Monitoring	Standard ASA monitors; arterial line recommended
Blood Preparation	High bleeding risk Type & Cross 2 units pRBCs; massive transfusion readiness
Neuromuscular blockade	Rocuronium acceptable, consider quantitative TOF monitoring
Induction	Propofol titrated to effect Antibiotics: 1-2 g ceftriaxone (or 1.5 – 3g amp/sulbactam) *Avoid long-acting opioids (not a very painful procedure)
Disposition	Most patients will go to PACU To ICU if MELD > 25, hemodynamic instability, or complications

Primary Anesthetic Considerations

Phase	Key Issues
Preoperative	ESLD physiology, encephalopathy, aspiration risk, coagulopathy, cardiac dysfunction (cirrhotic cardiomyopathy, pulmonary hypertension)
Intraoperative	potential massive hemorrhage, arrhythmias during guidewire manipulation, sudden preload increase after shunt creation
Postoperative	Hepatic encephalopathy, bleeding, hemodynamic instability, thrombosis, fluid/electrolyte shifts

PREOPERATIVE

System-Based Assessment

Neurologic

- Assess hepatic encephalopathy
- High sensitivity to sedatives and narcotics

Cardiovascular

- Hyperdynamic circulation
- Cirrhotic cardiomyopathy
- Coronary artery disease risk
- Review echocardiogram
- Screen for pulmonary hypertension

Pulmonary

- Reduced functional residual capacity
- Pleural effusions
- Hepatopulmonary syndrome
- Hypoxemia risk

Gastrointestinal

- Often full stomach
- High aspiration risk

Hematologic

- Expected coagulopathy and thrombocytopenia

Renal

- Evaluate for hepatorenal syndrome and renal dysfunction

Labs & Studies

Typically within 24 hours:

- CBC, CMP
- PT/INR, PTT, Fibrinogen
- Type & cross ≥ 2 units PRBC
- Consider TEG/ROTEM (if active bleeding/resuscitation)
- Pre-procedure echocardiogram recommended

OR Setup & Preparedness

- Two large-bore IVs
- Arterial line setup
- Crystalloids, albumin, and blood products available
- Blood/fluid warmer
- Consider rapid infuser

INTRAOPERATIVE

Anesthetic Technique

Induction

Propofol is appropriate in ESLD, with generally preserved clearance but potential for prolonged recovery after longer infusions. Titrate carefully to effect.

General Anesthesia

Advantages:

- Airway protection
- Controlled ventilation; breath holding for stent positioning
- Hemodynamic control
- Rapid response to bleeding or arrhythmias

Strongly favored in:

- Active bleeding
- Significant ascites
- Encephalopathy
- High MELD
- Complex procedures

Neuromuscular Blockade

Rocuronium is acceptable and commonly used.

Practice points:

- Expect possible prolonged duration → redose conservatively
- Use quantitative TOF monitoring
- Ensure TOF ratio ≥ 0.9 prior to extubation

Hemodynamics

ESLD Physiology

- Low systemic vascular resistance
- High baseline cardiac output
- Relative intravascular depletion

Post-TIPS Effects

- Sudden increase in venous return and preload may precipitate:
- Heart failure
- Pulmonary edema

Goals

- Maintain organ perfusion
- Avoid hypotension
- Prefer vasopressors over excessive fluid boluses

Bleeding Preparedness

Potential catastrophic bleeding from:

- Portal vein rupture
- Hepatic capsule perforation

Be prepared for:

- Massive transfusion
- Rapid resuscitation
- Possible emergent surgical intervention

Arrhythmias & Cardiac Effects

Guidewire traversal of the heart can mechanically irritate the myocardium and conduction system, leading to:

- Transient ectopy
- Bradycardia
- High-grade AV block or heart block. Risk increased with preexisting conduction disease (especially LBBB).

Practice points:

- Communicate with IR during wire advancement
- Expect transient rhythm changes
- Have resuscitation equipment readily available. (*Routine prophylactic pacing pads are not required in stable patients.*)

Communication with IR

- Notify anesthesia before portal puncture or balloon dilation
- Anticipate hemodynamic shifts and arrhythmias during wire manipulation

POSTOPERATIVE & DISPOSITION

Immediate Concerns

- Hemodynamic instability and/or hemorrhage
- Respiratory compromise
- Arrhythmias

Hepatic Encephalopathy Occurs in ~ **20–30%** of patients post-TIPS. Monitor closely for mental status changes and escalate early.

Disposition Planning Should be discussed with the IR team at case completion.

ICU recommended if:

- High MELD score
- Renal dysfunction or dialysis risk
- Hemodynamic instability
- Procedural complications

Patients arriving intubated from ICU should generally return to ICU post-procedure.

Stable patients may be transferred to monitored/step-down units.

Pain Management

TIPS is typically **not a painful procedure**.

- Avoid long-acting opioids. Titrate opioids cautiously, when needed.
- Avoid oversedation in encephalopathic patients

REFERENCES

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