CIRA Case of the Week
May 2016

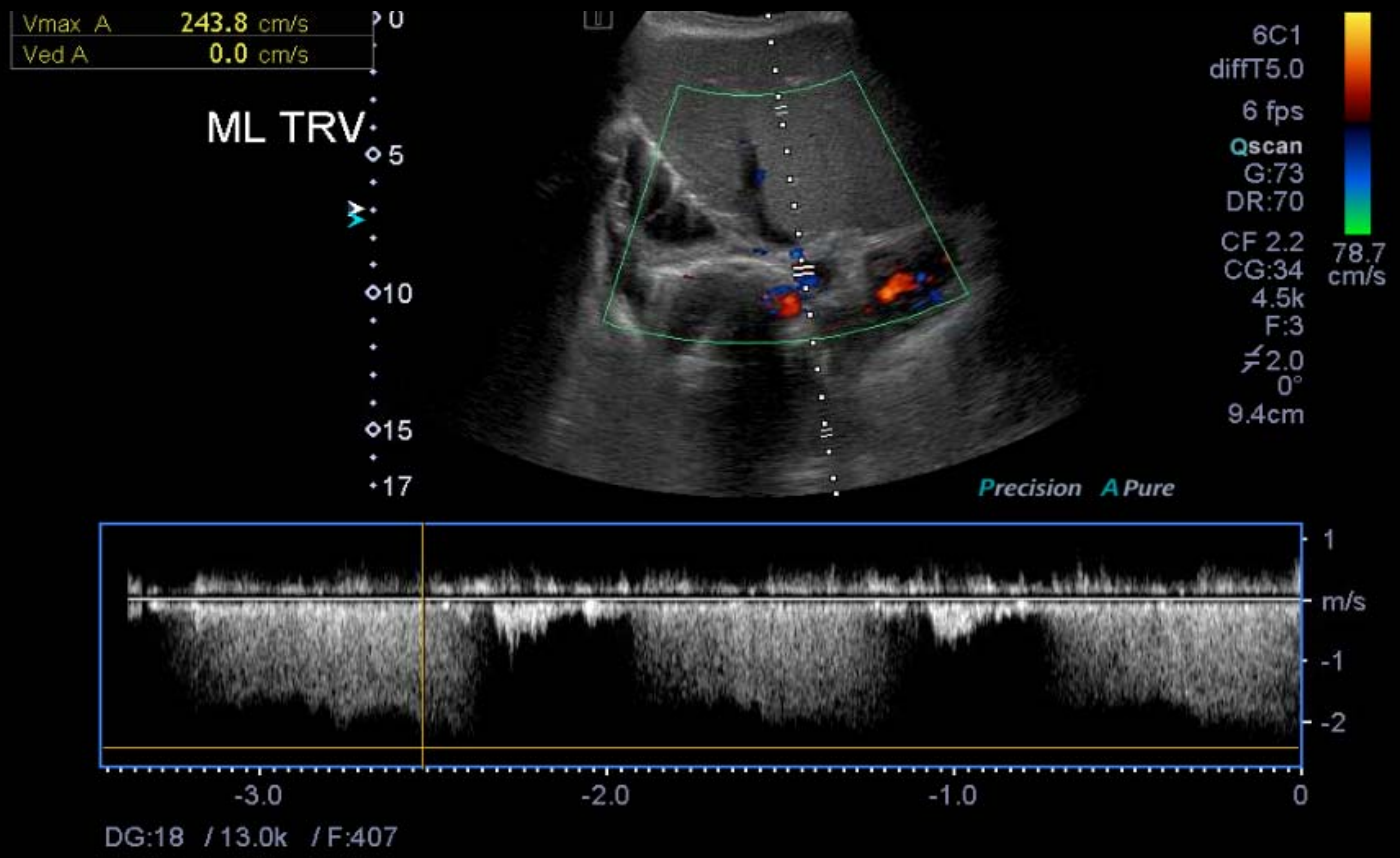
Case Courtesy of Drs. Avnesh Thakor and Michael Temple

University of Toronto

CLINICAL HISTORY

- 1 year old boy
- Split liver transplant (Segments II and III) - Uneventful
- 3 weeks post transplant: Rising GGT (137) and Bilirubin (23)
  Dropping albumin (26)
  Increasing abdominal girth.

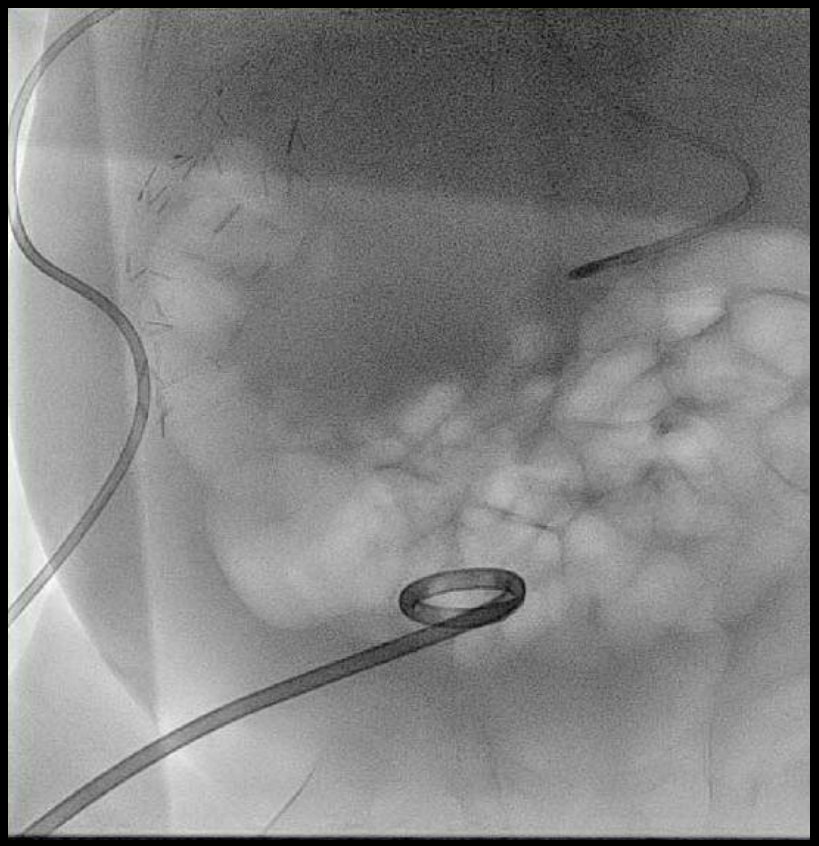
ULTRASOUND



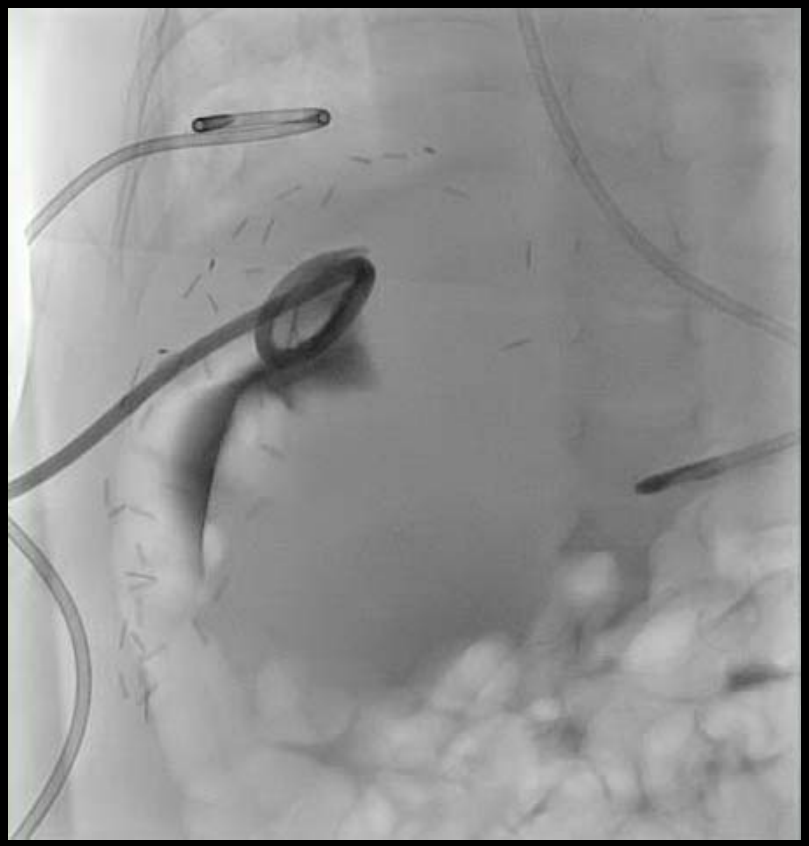
- High velocity at the HV anastomosis – 243 cm/s
- Normal hepatic arterial and portal venous Doppler examination
- Ascites, right subphrenic collection and right-sided pleural effusion

INTERVENTION

ABDOMINAL DRAIN INSERTION

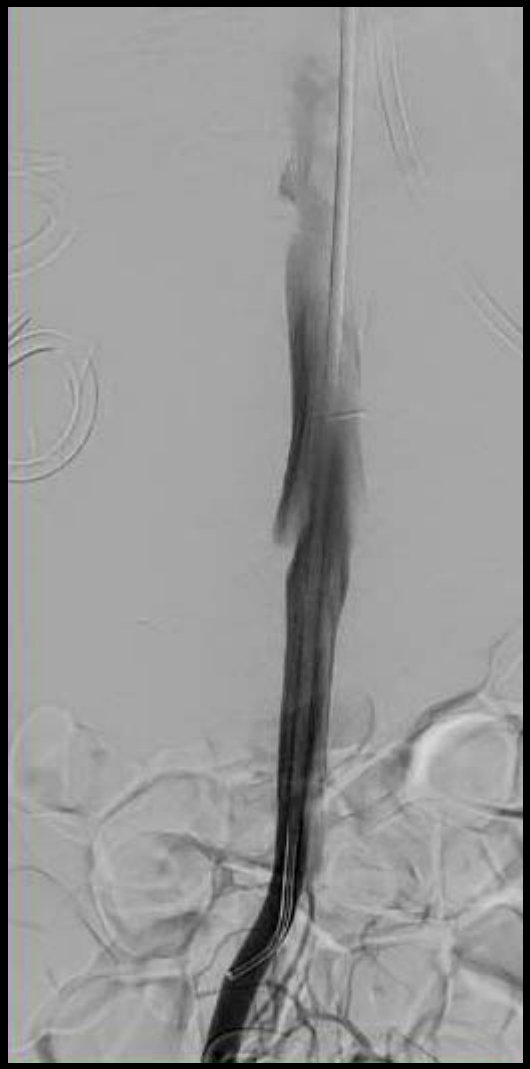


PLEURAL AND SUBPHRENIC DRAIN INSERTION

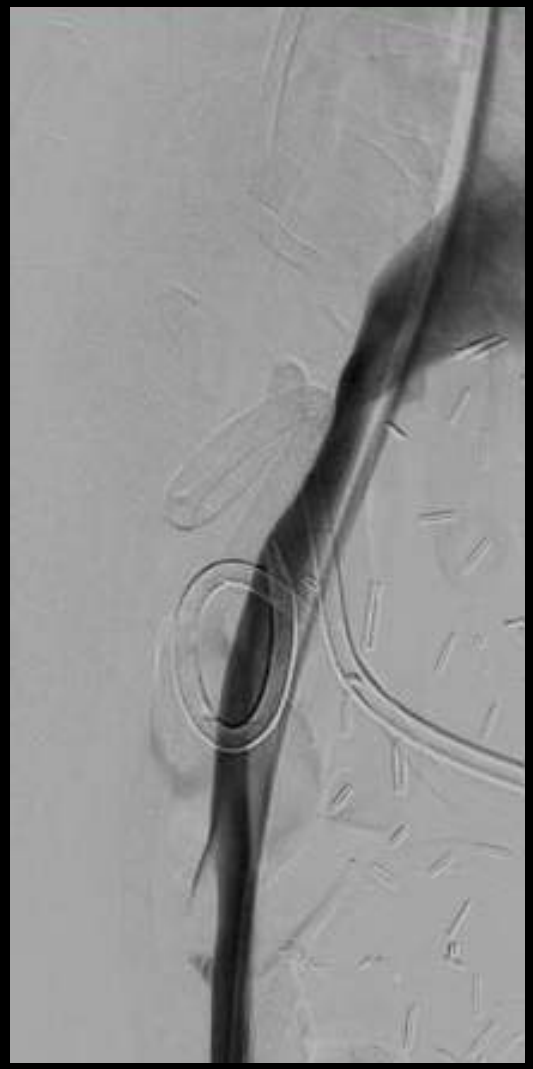


VENOGRAPHY

AP IVC VENOGRAM

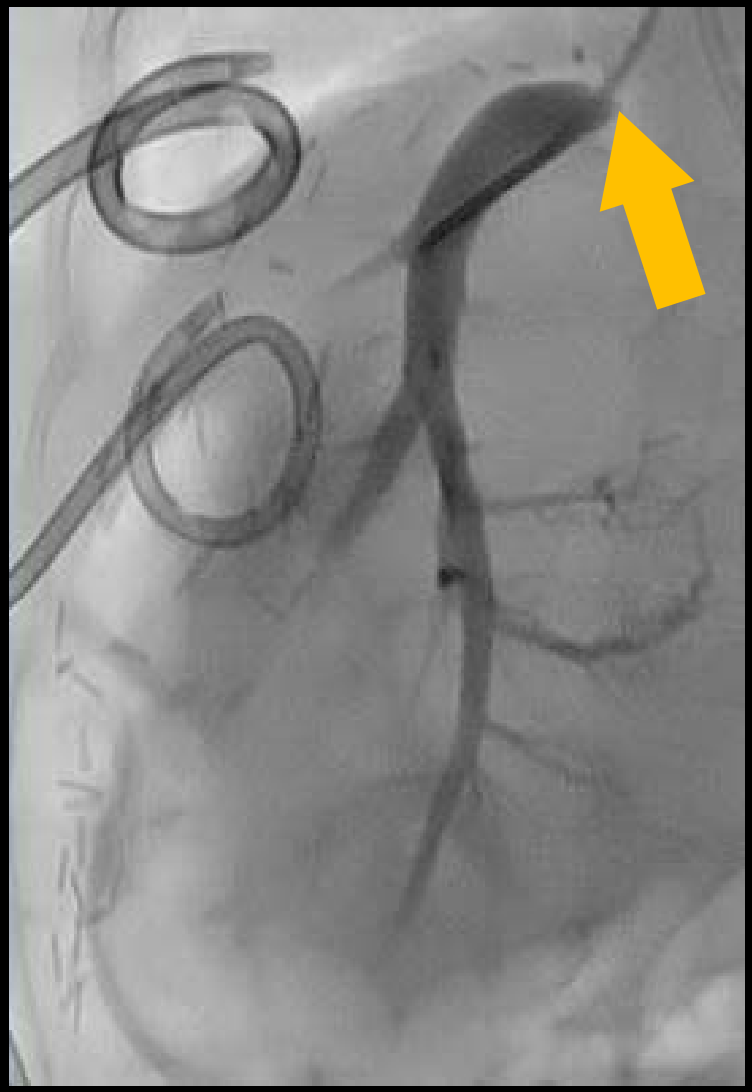


LATERAL IVC VENOGRAM

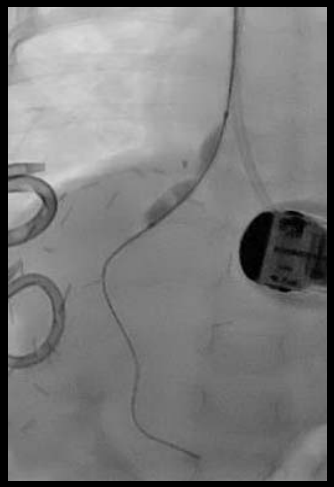


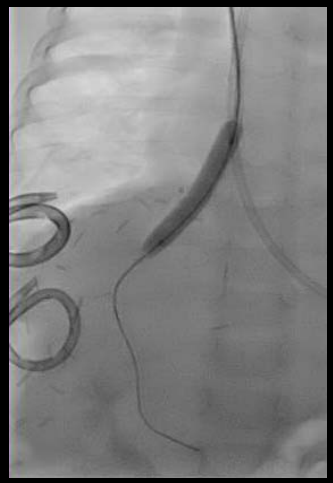
HEPATIC VENOGRAPHY AND INTERVENTION

HEPATIC VENOGRAPHY

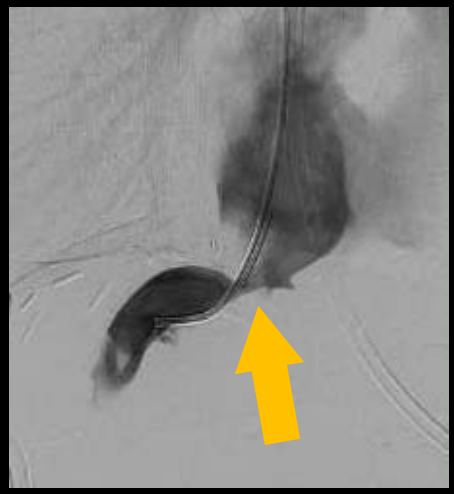


BALLOON DILATATION (8mm x 4cm)



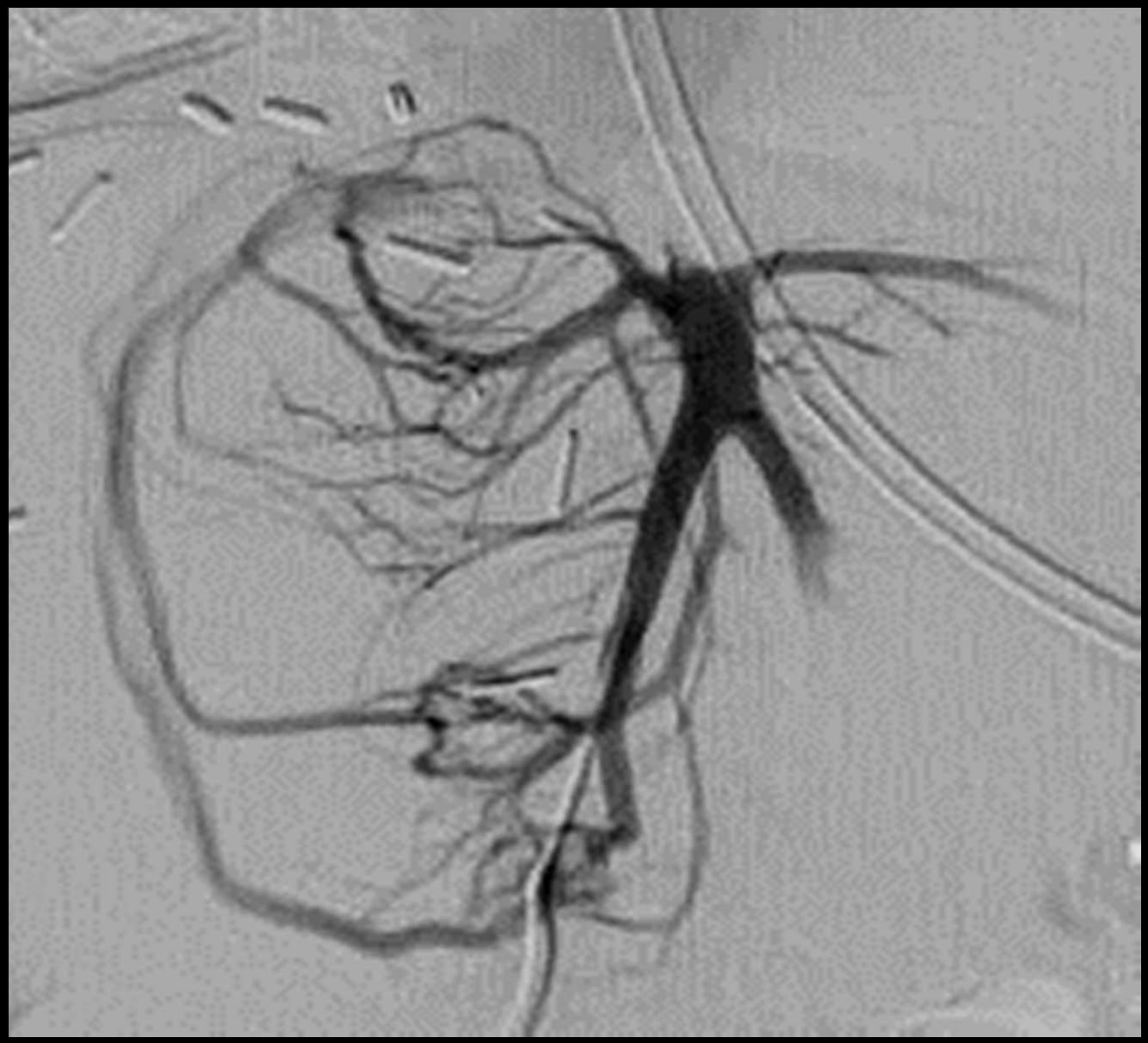


POST-DILATATION

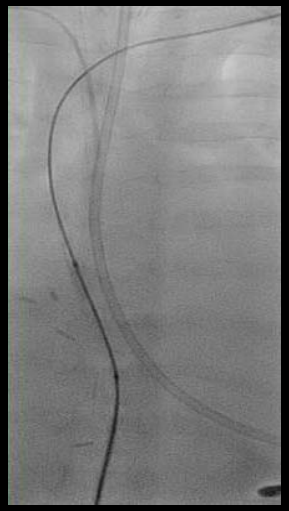


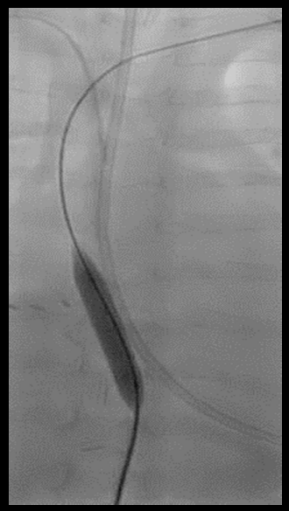
HEPATIC VENOGRAPHY AND INTERVENTION

HEPATIC VENOGRAPHY – PERCUTANEOUS PUNCTURE



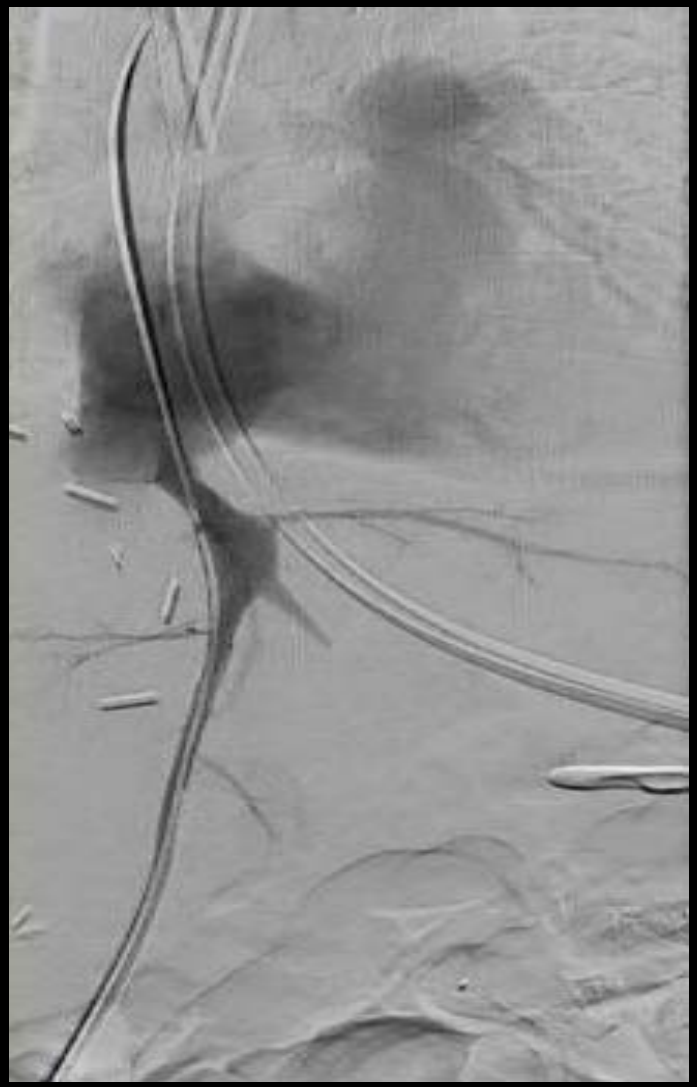
BALLOON DILATATION



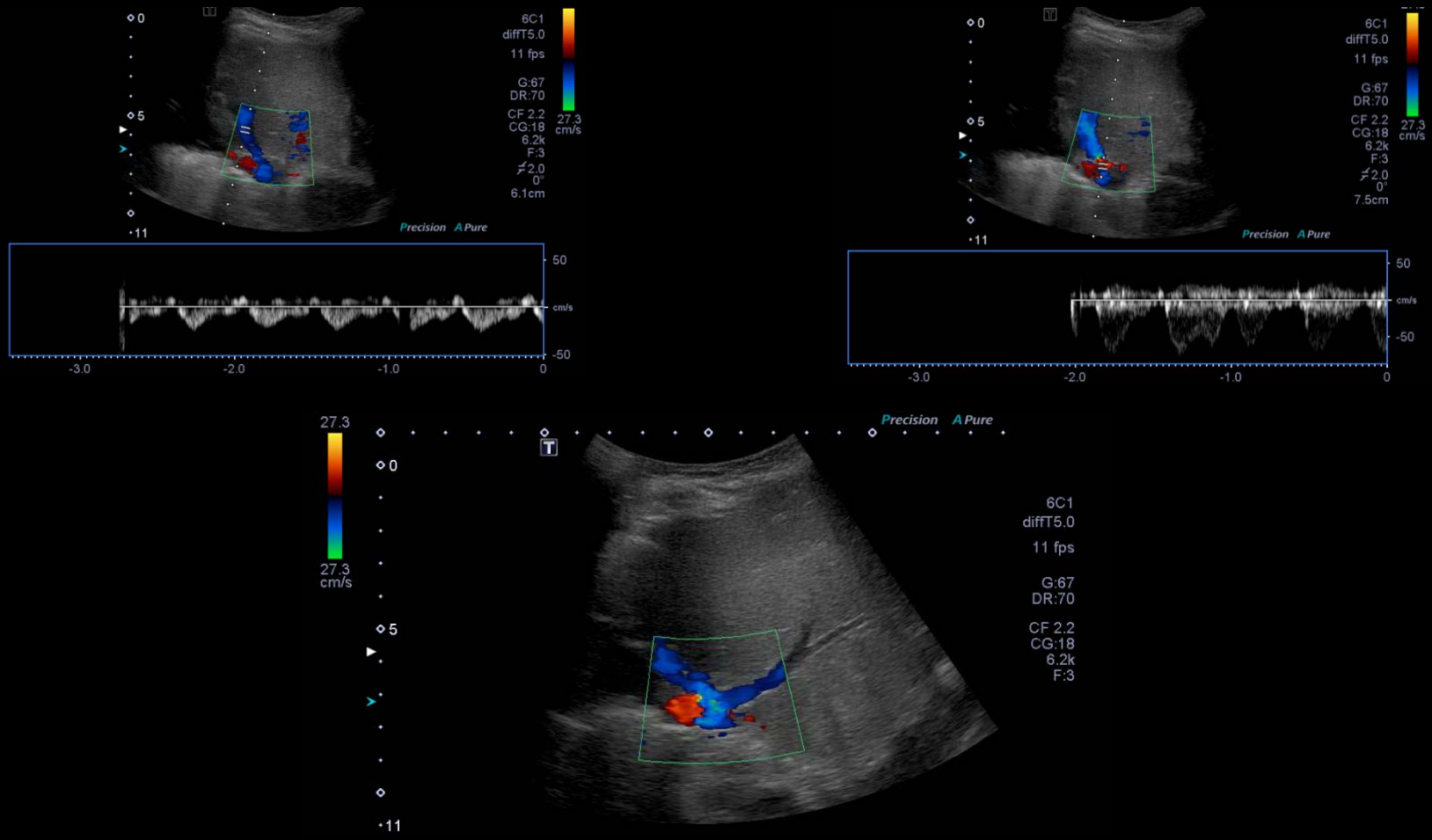


HEPATIC VENOGRAPHY AND INTERVENTION

POST-DILATATION



FOLLOW UP ULTRASOUND – NEXT DAY



Ultrasound shows normal velocity in both HV – 75 cm/s

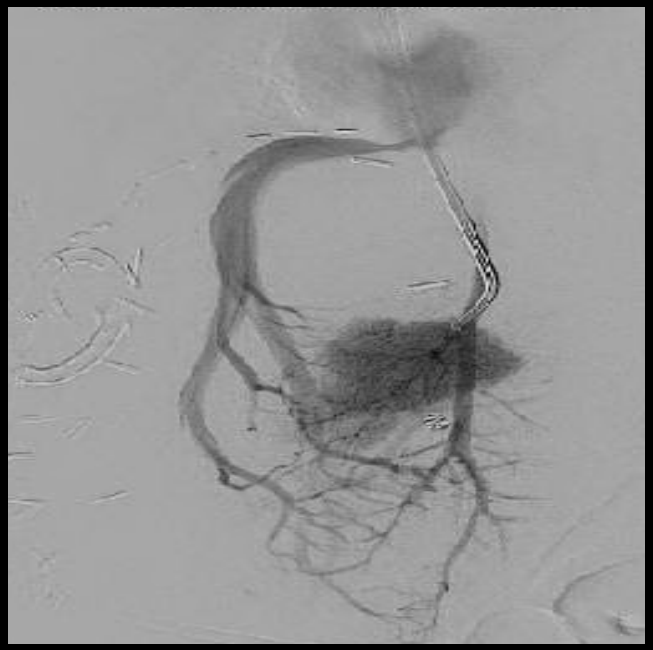
CLINICAL PROGRESSION

- Although the ascites improved, a repeat ultrasound a week later demonstrated increasing velocity at the HV anastomoses (196 cm/s) - ? restenosis

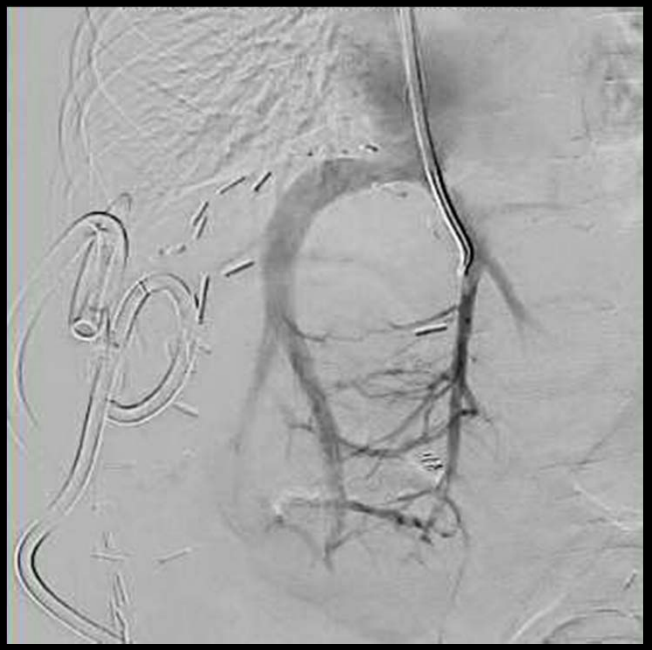
- Liver enzymes also started to rise again (GGT: 318, AST: 51 and ALT: 55)

REPEAT VENOPLASTY – 3 WEEKS LATER

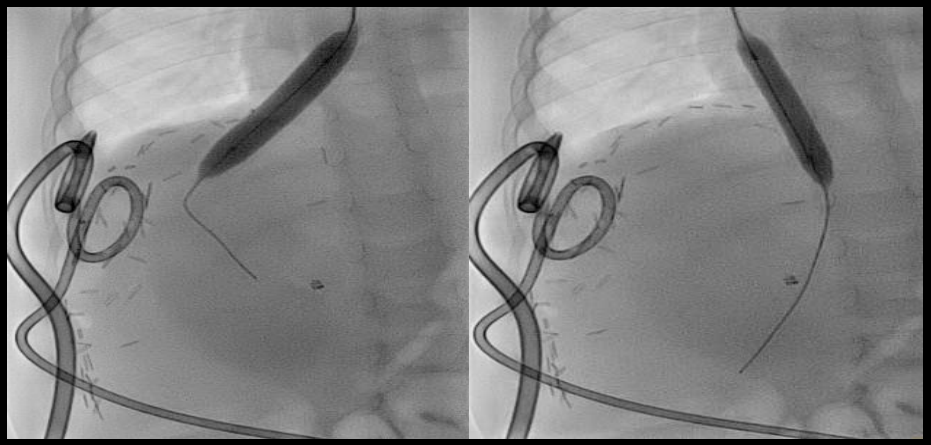
PRE-PLASTY



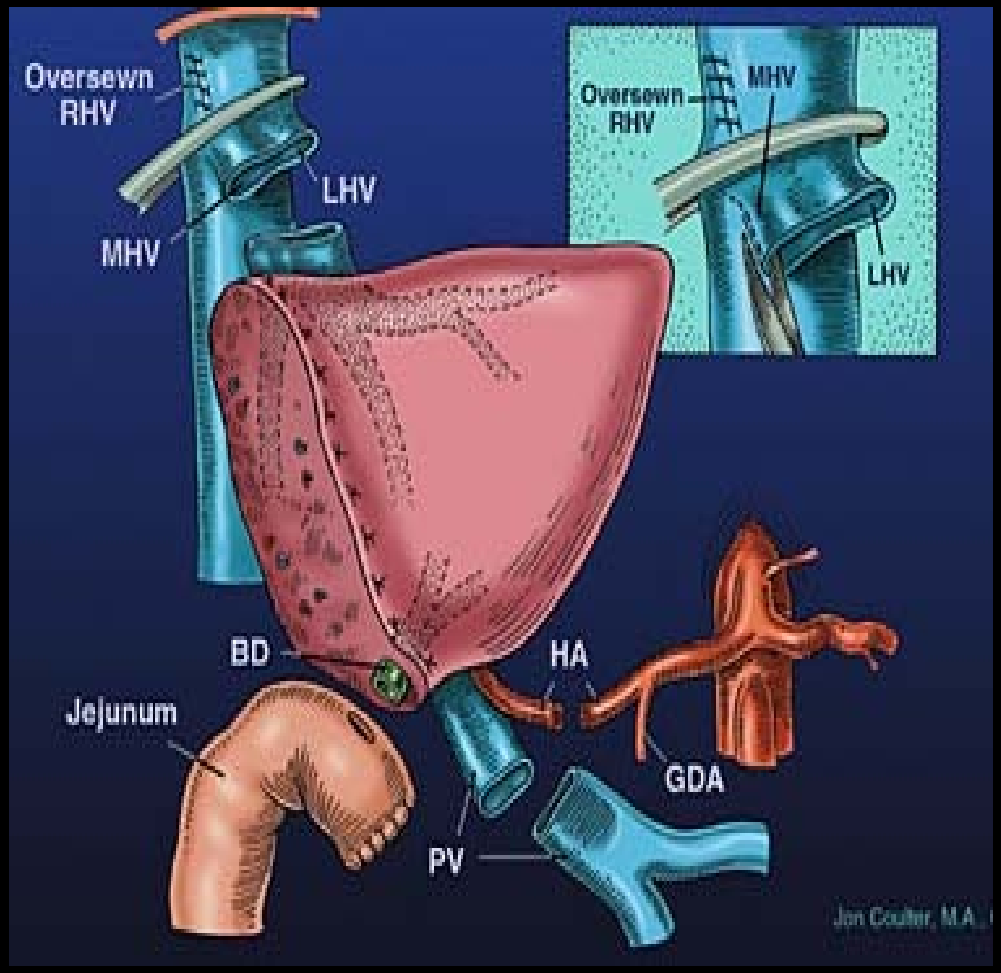
POST-PLASTY



BALLOON DILATATION



DISCUSSION - PEDIATRIC LIVER TRANSPLANT



Pediatrics, 1999; 20: 368-369

- Split liver transplant due to the lack of an adequate number of full size organs
- Usually segments II+III
- Hepatic arterial, hepatic venous, portal and bilioenteric anastomoses

Common trunk

vs.

individual segmental branches

DISCUSSION

- Split liver transplants in pediatric patients are technically challenging due to the short vascular pedicles.
  - Predisposes vessels to thrombosis and stenoses[1,2,3]
    - Portal vein stenosis - 4–8%
    - Inferior vena cava (IVC) stenosis - 1%
    - Hepatic vein stenosis - 2%
    - Hepatic artery stenosis - 11–20%
- Treatment is generally via a transjugular approach, but percutaneous transhepatic access may be needed when the anastomosis cannot be catheterized from the jugular access[4]
- Patency rates following percutaneous interventional procedures of venous outflow obstruction in PLT recipients[5]:
  - 70% at 3 months - 50% at 36 months

1. Broelsch CE et al. Ann Surg. 1991; 214:428–437
2. Buell JF et al. Ann Surg. 2002; 236:658–666
3. Uller et al. CVIR. 2013; 36:1562-1571
4. Darcy MD. Tech Vasc Interv Radiol. 2007; 10:240-245
5. Lorenz JM et al. JVIR. 2006; 17:1753-1761

DISCUSSION

What further interventions should be done if patient clinically deteriorates secondary to venous outflow obstruction?

- Drug-eluting balloon (neointimal hyperplasia due to differences in vessel diameters)

- Stent placement (pediatric patient, landing zone)

- Repeat surgical fixation of the liver (reduce torque/twist on the hepatic veins)