

# Optimal Management of Splenic/Portal Vein Thrombosis

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# Overview

## ■ Portal Vein Thrombosis (PVT)

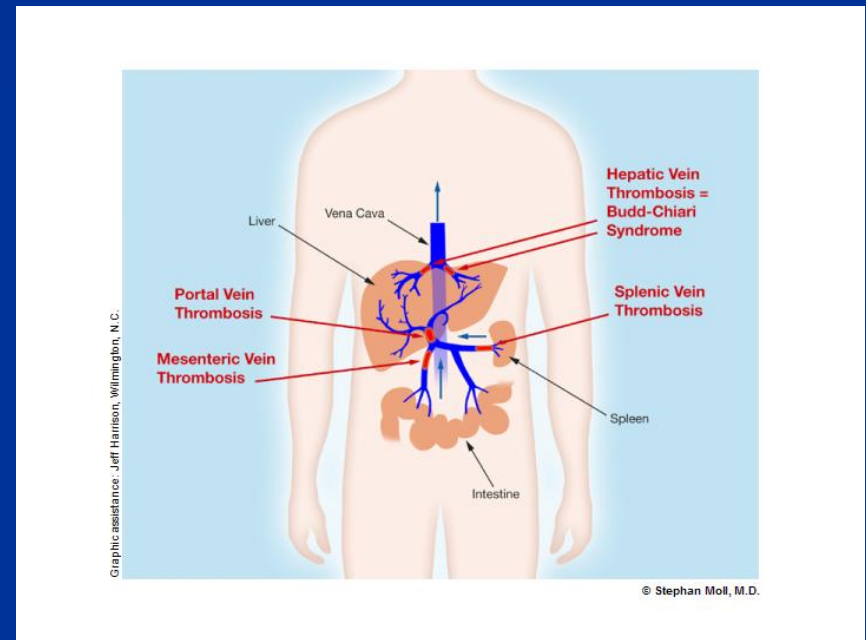
- Etiology
- Presentation/Clinical Aspects
- Diagnosis
- Management
  - Cirrhotic vs. non-cirrhotic
  - Medical vs. Invasive

## ■ Splenic Vein Thrombosis (SVT)

- Etiology
- Presentation/Clinical Aspects
- Diagnosis
- Management
  - Surgery vs. observation

# PVT: Management Dilemma

- Lack of randomized controlled data
- Determining acute vs. chronic disease
- Better understanding of etiology
- Perceived risks of anticoagulation



# PVT: Etiology

## ■ Common causes

- Cirrhosis
- Coagulation abnormalities
- Intra-abdominal infection
- Malignancy
- Umbilical vein catheterization (children)

## ■ Uncommon Causes

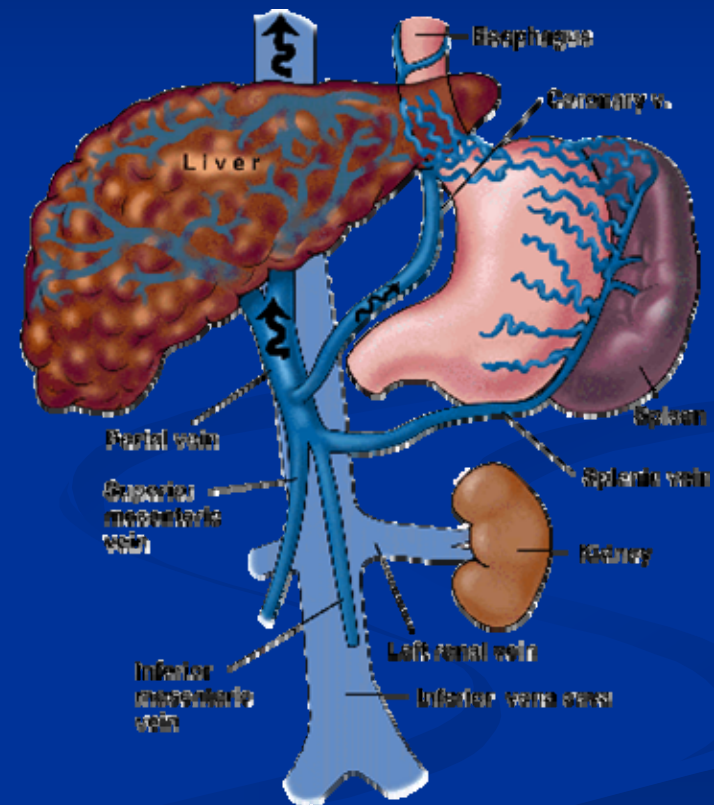
- Schistosomiasis
- Pancreatitis
- Postsurgical (splenectomy, liver tx)
- Compression by nodes
- Drugs (oral contraceptives)
- Pregnancy

# PVT: Presentation

- Can be asymptomatic
  - Increased hepatic arterial flow
  - Rapid development of collaterals (cavernomatous transformation)
- Acute PVT
  - <60 days prior to presentation
  - Abdominal pain, nausea, fever → symptoms related to extent of thrombosis (bowel ischemia)
  - Absence of clinical, endoscopic or radiological portal HTN

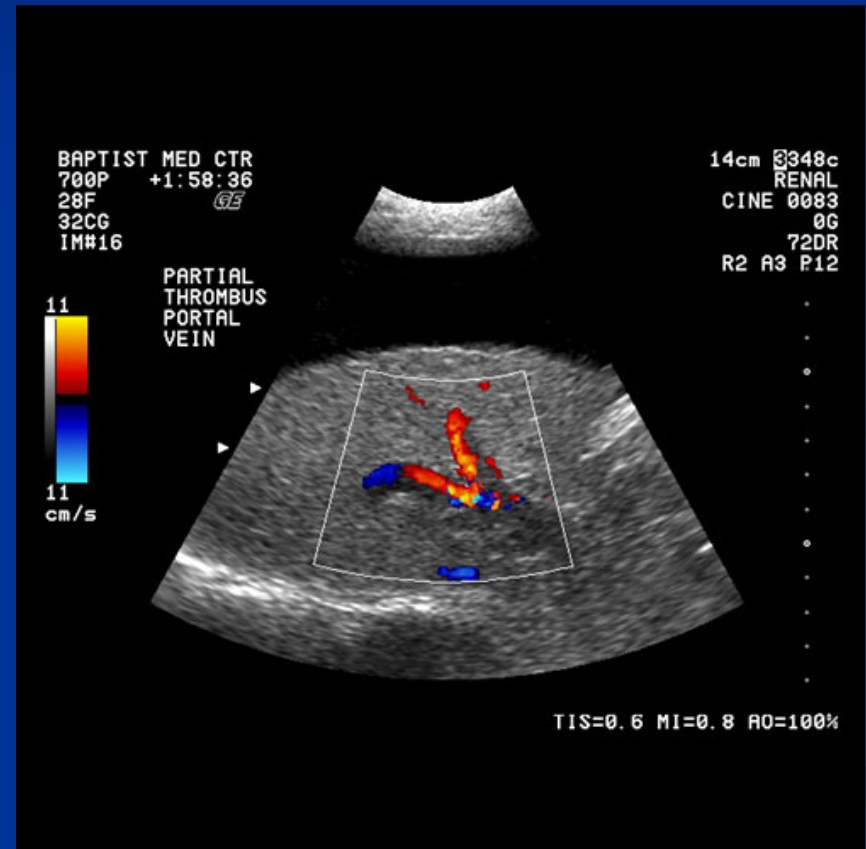
# PVT: Presentation

- Chronic PVT
  - Symptoms of portal HTN
    - Variceal bleeding
    - Ascites
    - Splenomegaly
    - Biliary obstruction (“cavernoma”)
- Growth retardation in children



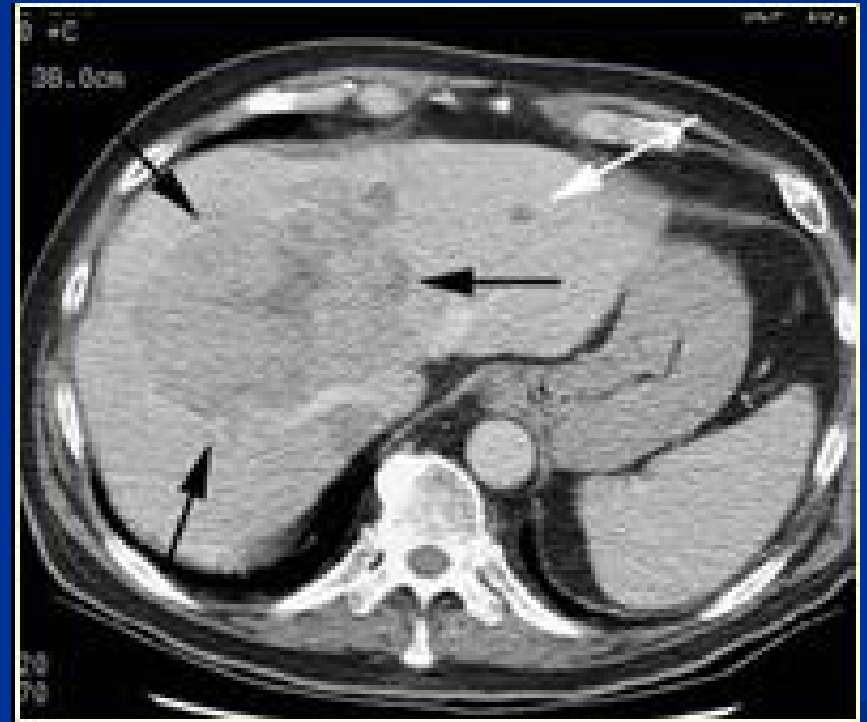
# PVT: Diagnosis (Ultrasound)

- Initial imaging method
- Color doppler ultrasound has 98% neg. predictive value



# PVT: Diagnosis (MRA/CT)

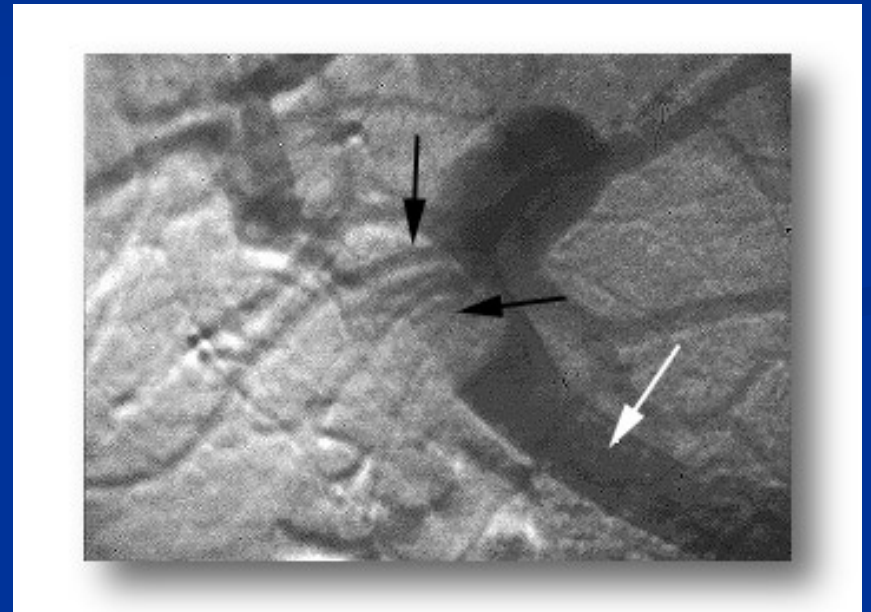
- MRA as accurate as angiography in detecting PVT
- CT allows diagnosis of etiology (malignancy)





# PVT: Diagnosis (angiography)

- “Gold standard” in diagnosis
- Invasive
- Useful when planning shunt surgery



# PVT: Management

- Goal of management is to reduce associated morbidity and mortality
- Two broad intentions:
  - Reverse or prevent advancement of thrombosis
  - Treat complications of established PVT (mainly variceal bleeding)

# Acute PVT: Anticoagulation

- Thrombolysis vs. systemic anticoagulation
  - No randomized data comparing the two methods
  - Evidence that early intervention is beneficial
- Malkowski *et al* (2003) studied 33 cases of acute PVT (symptoms 8-60 days prior to presentation)
  - Conservative mgmt. in first 5 pts → all died (variceal bleeding)
  - Thrombolysis in next 28
    - Recanalization if symptoms <14 days (n=10)
    - Restoration of hepatopetal flow in 13/18 remaining pts allowing normal liver function

# Acute PVT: Anticoagulation

- Condat *et al* (2000): retrospective review of 33 patients with acute PVT (recent abd pain, no evidence of portal HTN, no portal collaterals on imaging)
  - 27 pts received heparin/coumadin and had follow-up imaging → 25 showed recanalization
  - 2 pts received no anticoagulation and showed no recanalization on follow-up imaging
- Suggests early anticoagulation results in recanalization

# PVT: Anticoagulation

- Use in pts with chronic PVT varies secondary to presumed increased risk of bleeding
- Condat *et al* (2001) retrospectively reviewed 136 pts with PVT, but no cirrhosis or malignancy (84 pts with anticoagulation, 42 without)
  - No difference in bleeding rate, hemoglobin level on admission, or subsequent transfusion requirement
  - Anticoagulation associated with reduction in new thrombotic episodes
- Unclear whether group without anticoagulation was a better risk group (fewer comorbidities) at presentation

# Management of GE Varicies

- Several recent prospective randomized studies showing B-blockade and/or endoscopic therapy decreases rate of first bleed/rebleed
  - All studies done on cirrhotic pts without mention of PVT

# Mgmt of Varices in pts with PVT

- Vleggaar *et al* prospectively followed 21 pts with varices secondary to PVT (1982-1997)
  - All treated with sclerotherapy at initial bleed
  - Five pts rebled and were again treated with sclerotherapy (two had subsequent shunt procedure)
  - Pts had 95% survival at five years
    - 2 pts died from malignancy
    - 0 pts died from variceal bleeding
  - Conclusion: sclerotherapy should be primary treatment of bleeding varices in pts with PVT

# Mgmt of Varices in Pts with PVT

- Zargar *et al* prospectively randomized 49 children with bleeding varices secondary to extrahepatic portal venous obstruction (EHPVO) to sclerotherapy vs. band ligation
  - Both methods equal in arresting bleeding (100%) and eradication of varices (91.7% vs. 96%)
  - Fewer sessions required in band ligation (3.9(1.1) vs. 6.1(1.7)  $p < 0.0001$ )
  - Rebleeding higher in sclerotherapy group (25% vs. 4%  $p = 0.49$ )
- Conclusion: VBL safe/rapid means of eradicating varices associated with EHPVO in children



# Mgmt of Varices in Pts with PVT

- Use of B-blockers for prophylaxis of variceal bleeding
  - No studies on use in PVT
  - Theory that sluggish blood flow in the portal vein combined with prothrombotic state may encourage thrombotic progression
    - Argument favors endoscopic therapy over B-blockade

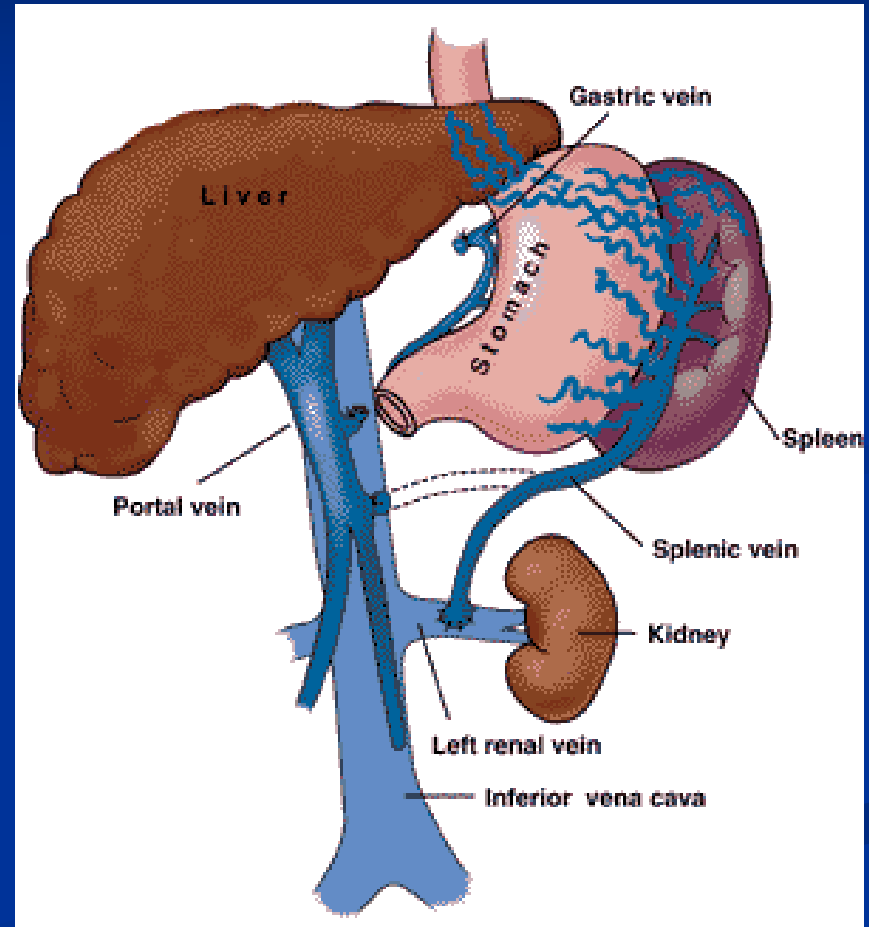
# Shunting Procedures in PVT

## ■ General Principles

- No consensus on optimal type of surgery or timing of surgery
- Permanently decompresses the portal system
  - Reduction in hypersplenism/spleen size
  - Improvement in growth retardation in children
- In general associated with low mortality and high shunt patency at 5 years (95% at 15 years in one series)

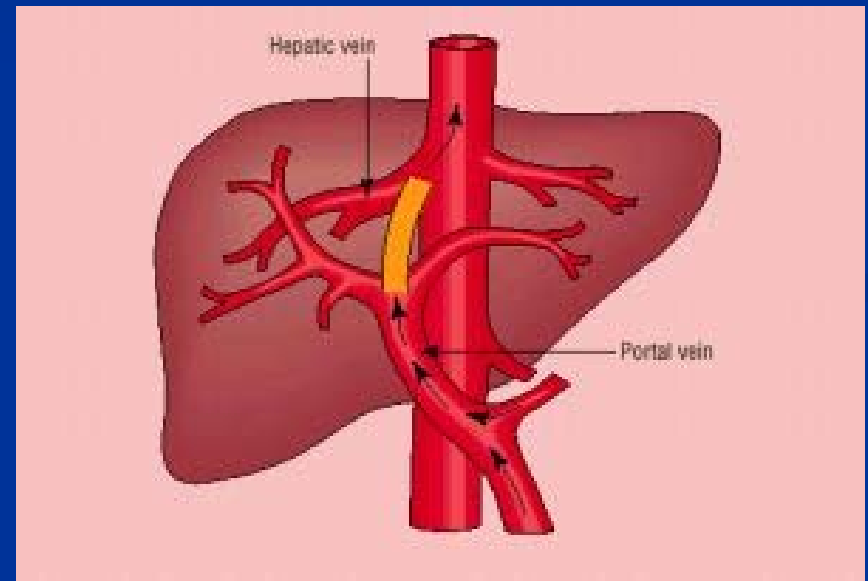
# Shunting Procedures in PVT

- Splenorenal or Mesocaval shunts used most frequently to avoid use of prosthetic material
  - Must have patent splenic vein for splenorenal shunt
  - Splenic vein  $>7\text{mm}$  preferred for patency



# Role of TIPS in Mgmt of PVT

- Useful in managing recurrent variceal bleeding in pts with cirrhosis and noncavernous PVT
- All series (3) reviewed consisted of 10 or less pts
- Thrombosis treated with either balloon angioplasty or thrombolysis with similar results
- Complications were minimal: recurrent bleeding after stent thrombosis

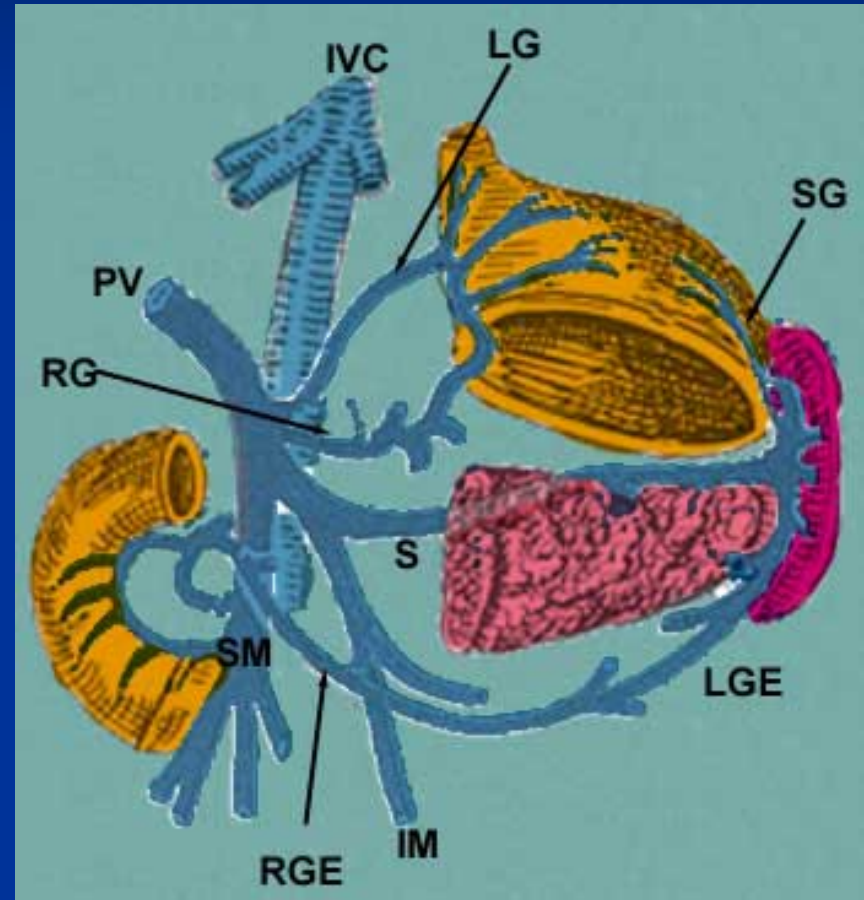


# SVT: Etiology

- Acute/chronic pancreatitis and pancreatic cancer most common causes
  - Historically pancreatic cancer more common cause
- Adenopathy from metastatic CA/lymphoma
- Iatrogenic causes (splenectomy, partial gastrectomy, distal splenorenal shunt)

# SVT: Pathophysiology

- Sinistral portal hypertension (left sided)
  - Collaterals most commonly use short gastrics
  - Short gastric → azygous (distal esophagus)
  - Short gastric → coronary vein → PV
  - Gastroepiploic vein → SMV
- Results in isolated gastric varices



# SVT: Clinical Manifestations

- Most patients asymptomatic
- Should be suspected in following group of pts:
  - History of pancreatitis and newly diagnosed GI bleeding
  - Splenomegaly without portal HTN, cirrhosis, or hematologic disease
  - Isolated gastric varices

# SVT: Clinical Manifestations

- Variceal Bleeding often first manifestation of SVT, but studies show risk is low
  - Bernades *et al* prospectively investigated 266 pts with chronic pancreatitis with US
    - 22 pts (8%) had isolated SVT, few had varices
    - On follow up endoscopic evaluation (up to 36 months), no change in appearance/location of varices
    - No episodes of bleeding during follow-up
  - Bradley *et al* prospectively followed 11 pts with SVT
    - Gastric or gastro-esophageal varices found in 6 pts (angiography)
    - At mean follow-up of 6.5 years, 2 pts developed bleeding



# SVT: Incidence of Varices

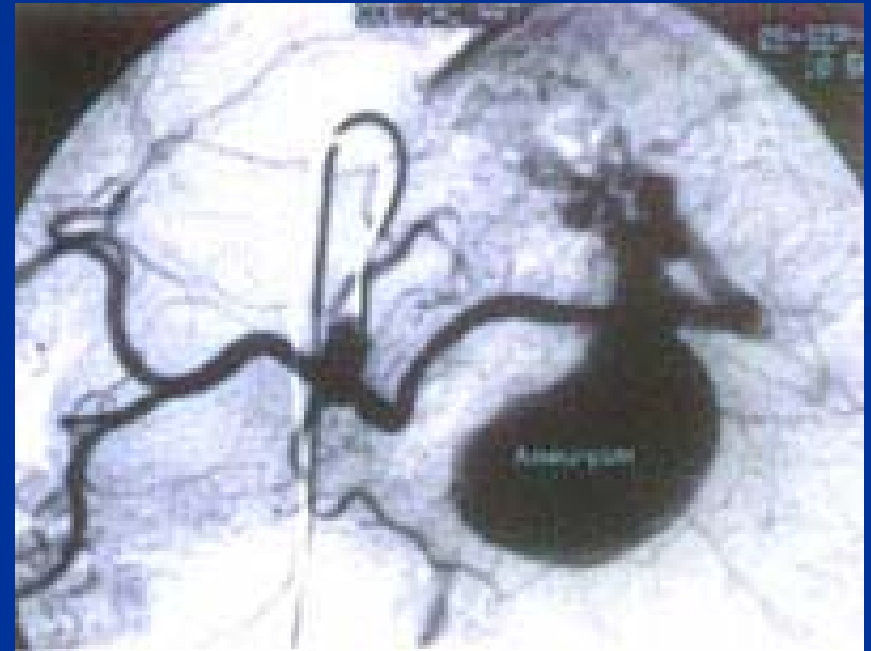
Author	n	Esophageal Varices	Gastric Varices	Combined Varices	GI bleeding due to varices
Warshaw <i>et al</i> (1987)	8	-	-	8	2
Bradley (1987)	11	-	6	-	2
Evans <i>et al</i> (1990)	12	-	10	-	10
Bernades <i>et al</i> (1992)	22	-	-	2	1

# SVT: Clinical Manifestations

- Other signs/symptoms:
  - Splenomegaly with rare leukopenia, thrombocytopenia, or splenic pain
  - Abdominal pain
    - Chronic pancreatitis, pseudocyst, carcinoma

# SVT: Diagnosis

- Ultrasonography initial test
  - Accuracy may be limited by size/location of vein
  - If patent, normal-appearing splenic vein seen, SVT unlikely
- Venous phase angiography
  - Gold standard confirmatory test
  - Localizes obstruction and routes of collateralization



# SVT: Management

- Sclerotherapy:
  - Gastric varices controlled in approx. 2/3 of active bleeds
- Gastric banding:
  - One prospective trial of 8 pts showed successful eradication of varices in 85% (7/8)
    - Only one pt had isolated gastric varices, none evaluated for SVT

# SVT: Management

- Splenectomy:
  - Treatment of choice for bleeding varices associated with isolated SVT
  - Eliminates venous collateral outflow, decompresses surrounding varices
  - Ability to treat pancreatic pathology



# SVT: Management

- Pts with asymptomatic varices:
  - Role of splenectomy is controversial
  - Due to relatively low risk of bleeding, observation is appropriate
  - If pt undergoing laparotomy for other reason, splenectomy is advised

# SVT: Management

- Splenic arterial embolization:
  - Rarely studied
  - Associated with splenic abscess (25%)
  - Pts with high operative risk
  - Pts with diffuse metastatic disease

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