

Management of Ascites

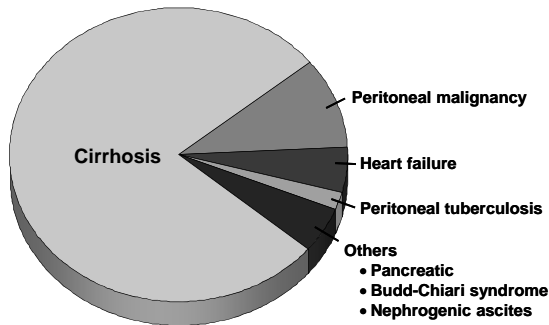
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I have no disclosures to make relative to my presentation.

CIRRHOSIS IS THE MOST COMMON CAUSE OF ASCITES

Cirrhosis is the Most Common Cause of Ascites



Source of the main 3 causes of ascites

Entity	Source	Pathophysiology
Cirrhosis	Hepatic sinusoid	Patients with cirrhotic ascites have an HVPG of at least 12 mmHg (nl 3-5) <i>Morali et al. J Hepatol 2002</i>
Heart failure	Hepatic sinusoid	Congestion of liver due to right heart failure (post-hepatic block)
Peritoneal malignancy/TB	Peritoneum	Inflammation or infiltration of the peritoneum

Rationale Behind the Serum-Ascites Albumin Gradient (SAAG)

(out of the sinusoid)

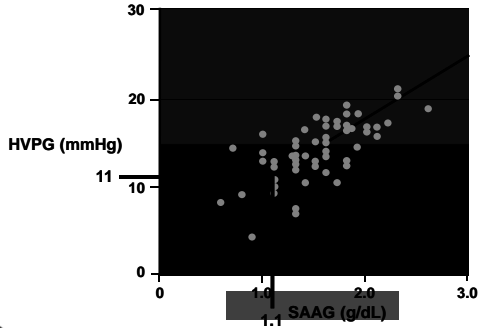
(into the sinusoid)

$$SIN_{hyd} + PER_{onc} = SIN_{onc} + \cancel{PER_{hyd}}$$

$$SIN_{hyd} = SIN_{onc} - PER_{onc}$$

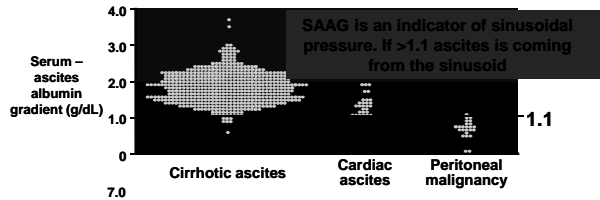
$$HVPG = \text{Serum albumin} - \text{Ascites albumin} = SAAG$$

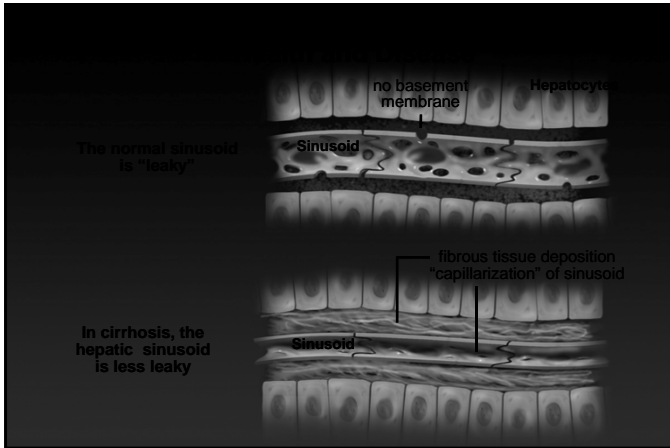
The Serum-Ascites Albumin Gradient (SAAG) Correlates With Sinusoidal Pressure

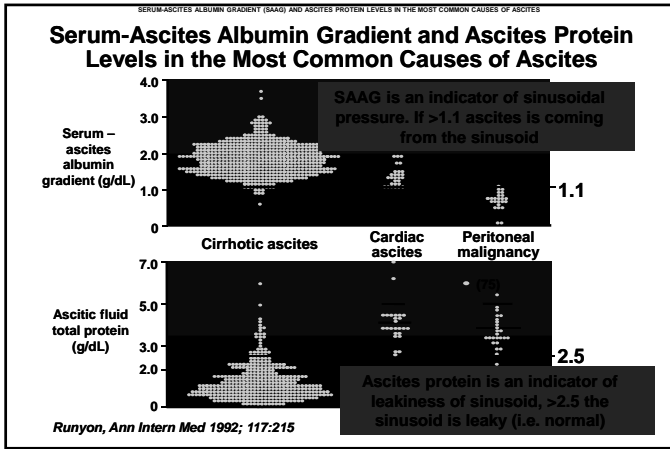


Hoefs J, J Lab Clin Med 1983; 102:260

Serum-Ascites Albumin Gradient and Ascites Protein Levels in the Most Common Causes of Ascites



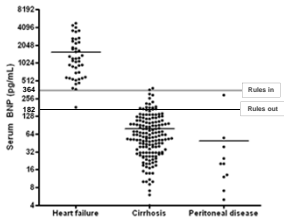




SAAG and ascites total protein can establish the differential among the main causes of ascites

CONDITION	SAAG	ASCITES PROTEIN
Cirrhosis	high	low
Peritoneal malignancy	low	high
Heart failure	high	high
Cutoff	1.1 g/dL	2.5 g/dL

Serum BNP has a higher diagnostic accuracy for cardiac ascites than SAAG/ascites protein

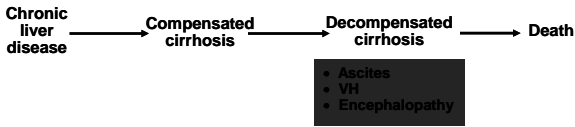


Test	LR (+) (rules in)	LR(-) (rules out)
SAAG >1.1; prot >2.5	9.63	
Serum BNP >364 pg/mL	168.09	
SAAG <1.1; prot < 2.5		1.272
Serum BNP < 182 pg/mL		0.000

Patients with new onset ascites

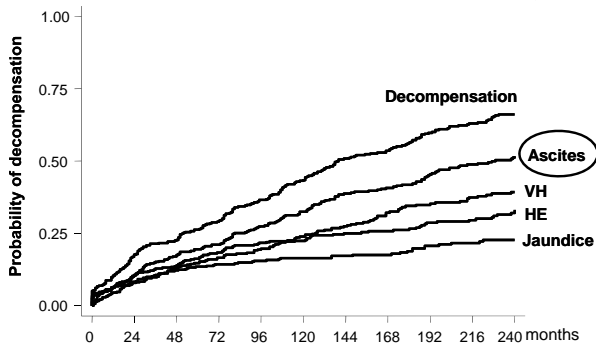
Farias et al. *Hepatology* 2014; 59:1043-51

Natural History of Chronic Liver Disease

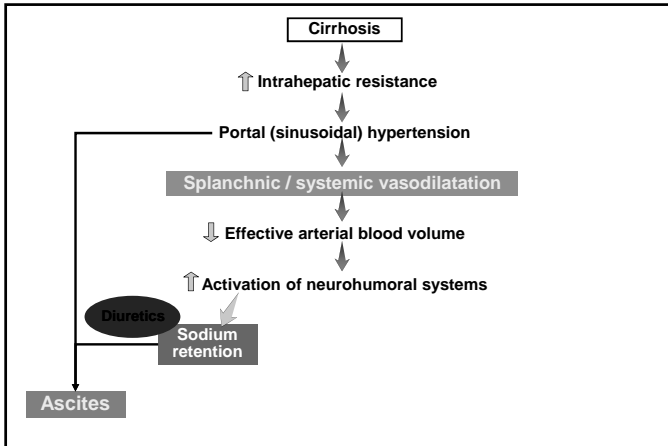


VH= variceal hemorrhage

In a cohort of patients with compensated cirrhosis, ascites was the most common decompensating event



D'Amico G. *Gastroenterology* 2001; 120: A2



SPIRONOLACTONE IS MORE EFFECTIVE THAN FUROSEMIDE IN CIRRHOTIC PATIENTS WITH ASCITES

Spironolactone is More Effective Than Furosemide in Uncomplicated Ascites

	Response	No response	Total
Spironolactone (150-300 mg/d)	18	1	19
Furosemide (80-160 mg/d)	11	10	21

Perez-Ayuso et al. Gastroenterology 1983; 84:961

- ### Treatment of ascites
- **Not an emergency, treat ascites in a stepwise unhurried manner**
 - **Other complications (GI bleed AKI, infection) are absent or have resolved**
 - **If patient uncomfortable → large volume paracentesis**
 - **Treatment aimed at achieving a negative sodium balance**

Less frequent dose reductions are needed when spironolactone is started alone

	Spironolactone alone* (n=50)		Spironolactone + Furosemide (n=50)
Response Rate	94%		98%
Time to Response	12.8 days		12.3 days
Dose reduction needed	34%	p=0.002	68%

Santos et al., J Hepatol 2003; 39:187

* Followed by furosemide if necessary

In addition to spironolactone-based diuretics....

- Salt restriction (2g/day = ~90mEq/day)
 - Do not compromise nutritional status
- Avoid non-steroidal anti-inflammatory drugs
- No water restriction unless serum Na <130 mEq/L
- Low threshold to perform a diagnostic paracentesis to investigate SBP

Management of Ascites

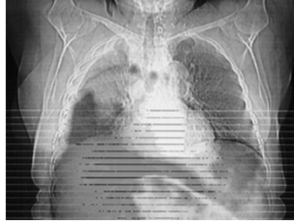
- Follow weight and labs (BUN, creatinine, lytes)
- Weight loss goals
 - 2-3 lb a week; no more than 1 lb / day
- If no weight loss
 - Make sure patient is not on NSAIDs
 - Check urine Na. If any of the following, patient is eating too much salt:
 - > 50 mEq/L or greater than daily Na intake
 - Spot UNa >UK (correlates with a 24-hour sodium excretion >78 mEq/L)

Hepatic Hydrothorax

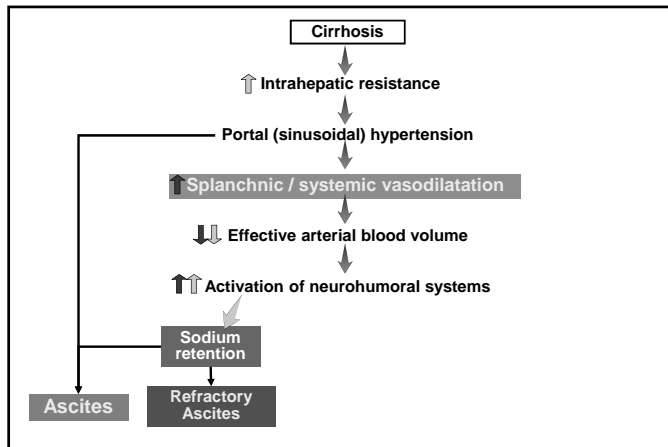
- Occurs in ~6% of patients with cirrhosis

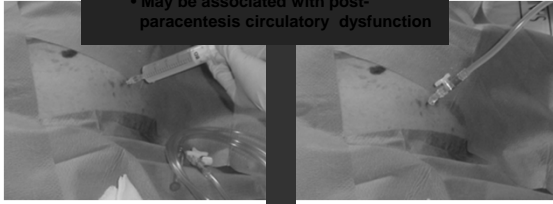

Krok KL, Cardenas A. Semin Respir Crit Care Med 2012; 33: 3-10.

- Due to trans-diaphragmatic movement of fluid from the peritoneum to the pleural space through diaphragmatic defects



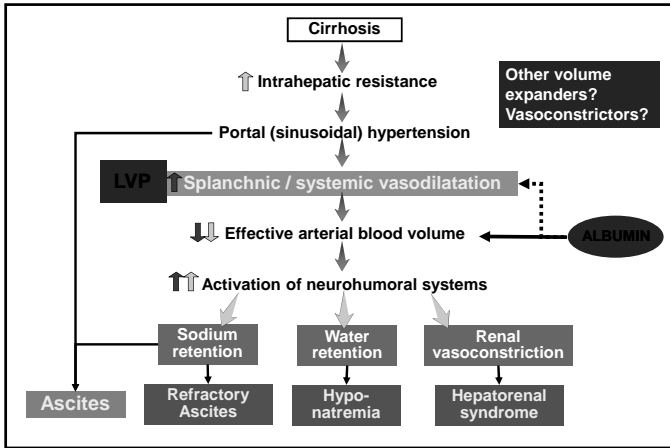
- Management same as for cirrhotic ascites

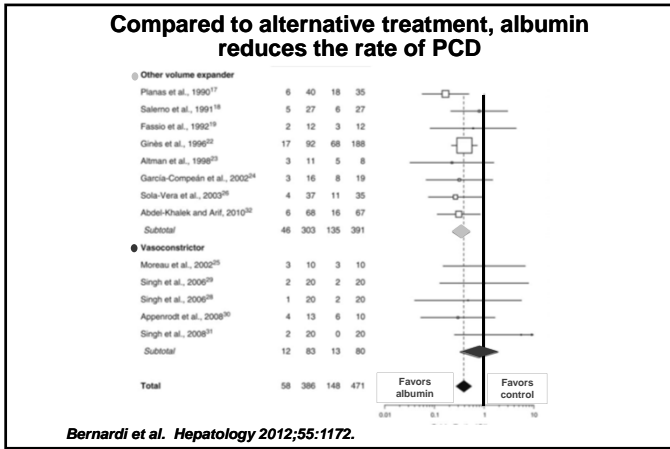


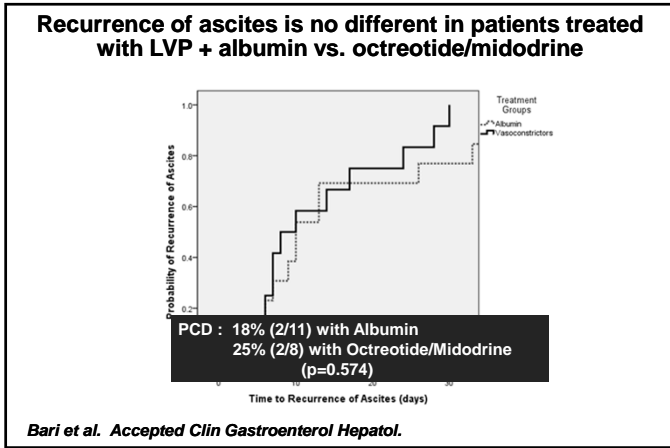


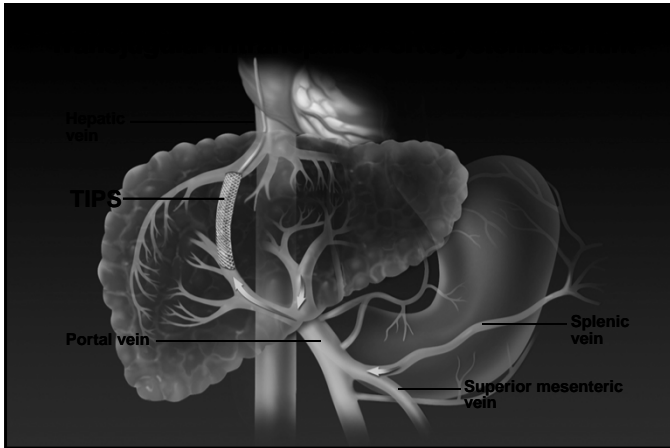
Large volume-paracentesis (LVP):

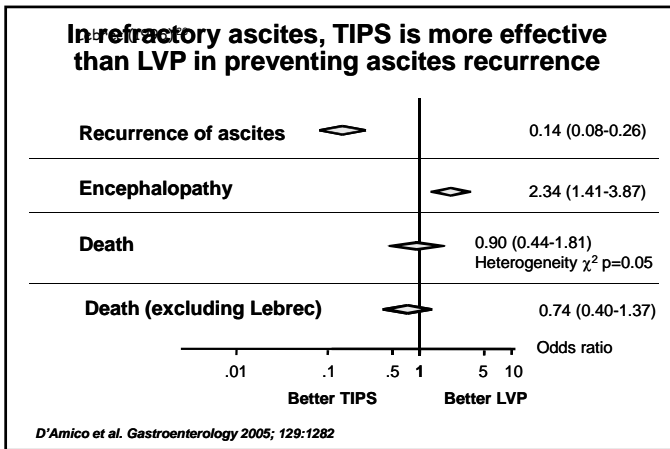
- Local therapy
- Recurrence of ascites is the rule
- May be associated with post-paracentesis circulatory dysfunction

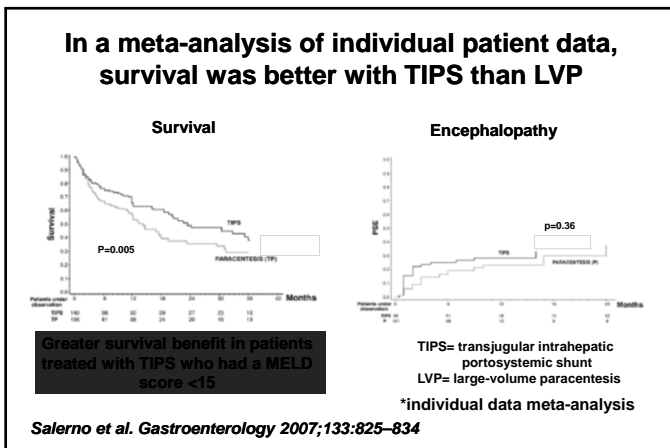








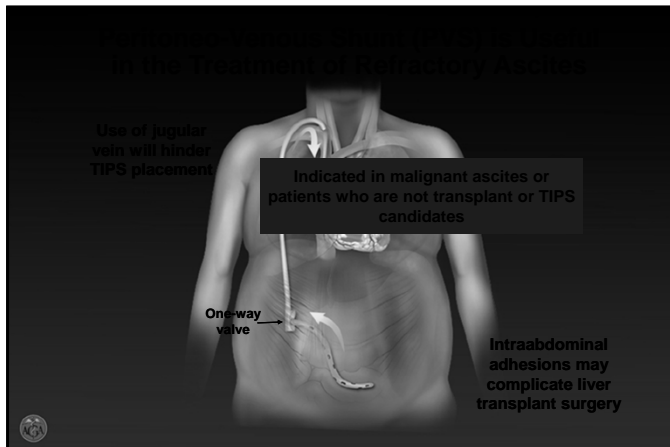




Refractory hepatic hydrothorax

- A trial of in-hospital diuretic therapy should be attempted
- Serial thoracenteses – may be required too frequently
- Chest tube or indwelling catheter should not be placed (→ infection, AKI)
- TIPS may need to be considered earlier
 - Clinical response (67%) and survival are also associated with pre-TIPS MELD <15

Dhanasekaran et al. Am J GE 2010.



Pilot safety study of Automated Low-Flow pump for refractory Ascites (ALFA) (n=40)



- Placed under general anesthesia
- 6-month followup
- LVP 3.4 → 0.2 per month
- Infections → antibiotic prophylaxis (76%→42%)
- Catheter dislodgement/problems (10/40=25%)
- Surgical complications (5/40)
- Progressive decrease in serum albumin
- 13 early termination, 8 died, 2 txp

Bellot et al. J Hepatol 2013;58:922-7
