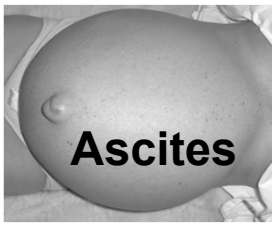


Ascites

when to tap, what to test for, when to treat, and what to follow

Puneeta Tandon *MD, FRCP(C), MSc (Epi)*

Objectives

- 1) Differential diagnosis of a patient with ascites
- 2) Working up a patient with ascites
- 3) Treatment of a patient with cirrhotic ascites
- 4) Diagnosis and treatment of SBP (spontaneous bacterial peritonitis)

Definition

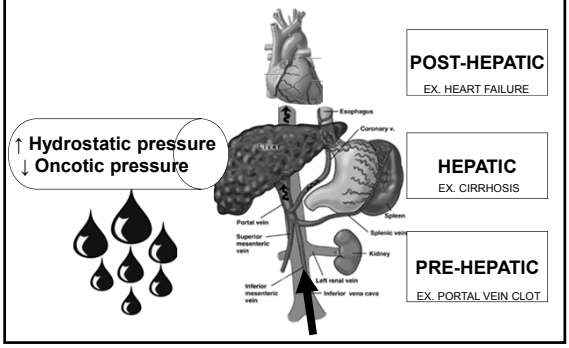
- Accumulation of free fluid in the peritoneal cavity

Table 78–1 | **Causes of Ascites**

CAUSE	% OF TOTAL NUMBER OF PATIENTS	
Cirrhosis (with or without infection)	85	
Miscellaneous portal hypertension-related (including 5% with two causes, including portal hypertension)	8	PORTAL HYPERTENSIVE
Cardiac ascites	3	
Peritoneal carcinomatosis	2	
Miscellaneous nonportal hypertension-related	2	NON- PORTAL HYPERTENSIVE

Data from Runyon BA, Montano AA, Akriviadis EA, et al: The serum-ascites albumin gradient is superior to the exudate-transudate concept in the differential diagnosis of ascites. Ann Intern Med 117:215, 1992.

Portal Hypertension related

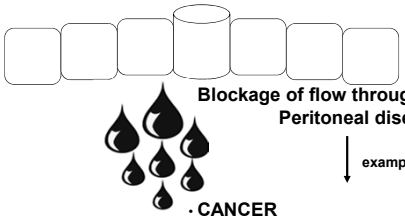


POST-HEPATIC
EX. HEART FAILURE

HEPATIC
EX. CIRRHOSIS

PRE-HEPATIC
EX. PORTAL VEIN CLOT

Non portal hypertension related

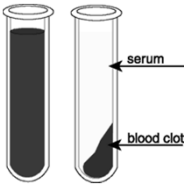


Blockage of flow through lymphatics
Peritoneal disease

↓ examples

- **CANCER**
- **INFECTION (TB)**
- **INFLAMMATION (pancreatitis, SLE)**
- **etc**

Serum ascites albumin gradient



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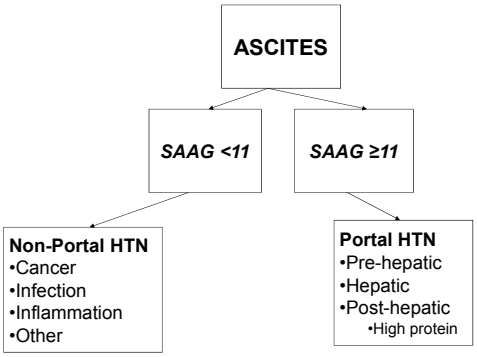
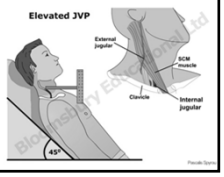
SAAG = Serum albumin - Ascites albumin



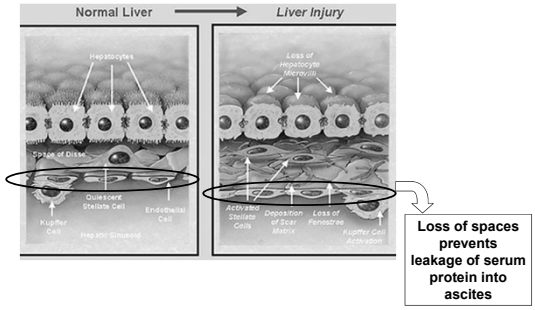
Differentiating causes of portal HTN related ascites

- **Pre-hepatic**
  - Doppler ultrasound or CT scan to look for blockage in the vessels
- **Hepatic**
  - Signs of cirrhosis: exam and imaging
- **Post-hepatic**
  - High Jugular venous pulse
  - High ascites fluid protein
  - Cardiac imaging

HIGH GRADIENT
≥ 11 g/dL



Ascitic protein level to differentiate cardiac and cirrhotic portal HTN



Loss of spaces prevents leakage of serum protein into ascites

Other tests on ascitic fluid

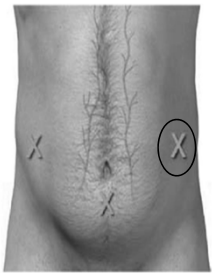
- **Cell count and differential**
  - Neutrophil count ≥ 250/mm3 = spontaneous bacterial peritonitis
- Ascitic protein level
  - Protein level > 25 g/L with high SAAG suggestive of cardiac congestion
- Gram stain and culture
- Cytology
- Glucose, Triglycerides, Bilirubin, Amylase, LDH, CEA.

Indications for diagnostic paracentesis

- New onset ascites
- Admission to hospital or clinical deterioration, either inpatient or outpatient
  - Fever, abdominal pain, abdominal tenderness, change in mental status, ileus, hypotension.
  - ***N.B.* SBP can be asymptomatic**
- Lab abnormalities that indicate infection
  - Leukocytosis, acidosis, worsening renal function, etc.
- Gastrointestinal bleeding (high risk for infection)

Safety of paracentesis

- Risk of bleeding very low
  - Use of prophylactic transfusions and platelets *not* supported
    - Avoid visible abdominal wall collaterals
    - Z-tract technique
- U of A protocol replacement if INR > 2 or platelets <30



Treatment of cirrhotic ascites

AVOID ALCOHOL

NEGATIVE SODIUM BALANCE
-Decrease sodium intake
-Increase sodium excretion (diuretics)

THERAPEUTIC PARACENTESIS

CONTINUED TAPS
versus
TIPS

Transplant Work-up

Treatment: Conservative Management (step 1)

- Decrease Na intake
  - NaCl restriction to < 2 g/d (88 mmol/d)
  - **AVOID NSAIDS**
  - **Re-evaluate need for anti-hypertensive medications**
  - **NO NEED TO RESTRICT FLUID INTAKE** until serum Na <125

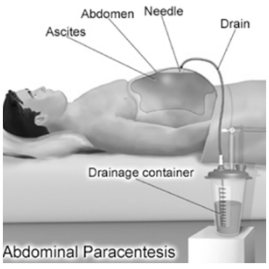
Treatment: Diuretics (step 2)

- **Usual regimen**
  - Furosemide 40 mg daily & Aldactone 100 mg daily
  - Maximum is 160 mg and 400 mg respectively
  - Desired weight loss is 1 kg/day if edema and 0.5 kg/day if no edema
- **What to monitor**
  - Body weight
  - Electrolytes and creatinine (in 1 week and then q weekly to monthly depending on patient factors)

When to reduce/stop diuretics

- Hyponatremia (Na<125mmol/L)
- Significant ypokalemia or hyperkalemia
- Renal insufficiency (creatinine<133umol/L)
- Painful gynecomastia
- Recurrent unprecipitated hepatic encephalopathy

Treatment- Therapeutic paracentesis (step 3)



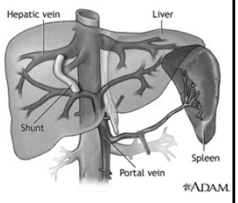
Albumin should be given if >5 Liters of ascites are taken off

- **Large volume paracentesis (>5 L)**
  - Randomized controlled trial of albumin vs placebo
    - Albumin group had less kidney dysfunction and less drops in sodium.
    - 1 bag of 25% albumin (100%) for every 3 liters of ascitic fluid removed

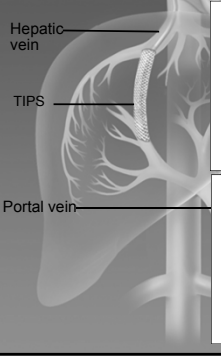
Gines P et al, Gastroenterology 1988

What if paracentesis is not enough?

- Ensure compliance
- Serial paracenteses
- Transjugular intrahepatic portosystemic shunt (TIPS)
- Liver Transplant



TIPS decompresses hepatic sinusoids



TIPS: Pathophysiology

- **Pathogenic treatment-decreases PP**
- **Decreases underfilling**
- **Deactivates vasoactive systems**
- **Increases UNa → might need one month, might increase during first yr**

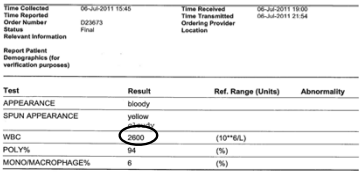
TIPS: Clinical effects

- **Successful in removing ascites in 80%**
- **Patients generally need diuretics**
- **Encephalopathy 30-40% (10% chronic)**
- **Reduce other complications of cirrhosis (e.g. variceal hemorrhage)**

Spontaneous Bacterial Peritonitis

- Definition based on cell count and differential
  - Neutrophil count ≥ 250/mm3 = spontaneous bacterial peritonitis
  - **C&S should be collected directly into culture bottles**
- Treatment with iv 3rd generation cephalosporin (ie cefotaxime 2 g iv q8h)
- N.B. treatment for primary prevention of SBP if admitted with UGI bleed
- N.B. if Hx of SBP needs secondary prevention at discharge

Is this SBP?



Time Collected	06-Jul-2011 15:45	Time Received	06-Jul-2011 19:00
Time Reported		Time Transmitted	06-Jul-2011 21:54
Order Number	D23673	Ordering Provider	
Status	Final	Location	
Relevant Information			
Report Patient Demographics (for verification purposes)			

Test	Result	Ref. Range (Units)	Abnormality
APPEARANCE	bloody		
SPUN APPEARANCE	yellow		
WBC	2600	(10**6/L)	
POLY%	94	(%)	
MONO/MACROPHAGE%	6	(%)	

Ceftriaxone 1-2 g iv q 24h + iv albumin (100cc of 25% iv bid to tid x 3 days)

Ascitic neutrophil count= 94% x 2600 total WBC count = 2444
Therefore this IS SBP

Conclusions

- Differential diagnosis of a patient with ascites based initially on the SAAG where a SAAG ≥ 11 is due to portal hypertension.
- Negative sodium balance is vital for the treatment of ascites secondary to cirrhosis.
- Diagnosis of spontaneous bacterial peritonitis essential for treatment but also for prognosis and long term planning.

Cirrhosis care clinic
FAX# 780-492-9873

- Evidence of cirrhosis on radiological imaging
- Multidisciplinary clinic
  - Nurse Practitioner – Michelle Carbonneau
  - Hepatologists – P Tandon, JG Abraldes
  - Dietician – V DenHeyer
- Two hour initial patient assessment and education session with ongoing follow-up