Ascites

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

<table>
<thead>
<tr>
<th>CAUSE</th>
<th>% OF TOTAL NUMBER OF PATIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cirrhosis (with or without infection)</td>
<td>85</td>
</tr>
<tr>
<td>Miscellaneous portal hypertension-related</td>
<td>0</td>
</tr>
<tr>
<td>including 5%, with two cases, including portal hypertension</td>
<td></td>
</tr>
<tr>
<td>Cardiac failure</td>
<td>2</td>
</tr>
<tr>
<td>Portal caval obstruction</td>
<td>2</td>
</tr>
<tr>
<td>Miscellaneous nonportal hypertension-related</td>
<td>2</td>
</tr>
</tbody>
</table>

↑ Hydrostatic pressure
↓ Oncotic pressure

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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

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

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Serum ascites albumin gradient

\[ \text{SAAG} = \text{Serum albumin} - \text{Ascites albumin} \]

ASCITES

SAAG <11

Non-Portal HTN
- Cancer
- Infection
- Inflammation
- Other

SAAG ≥11

Portal HTN
- Pre-hepatic
- Hepatic
- Post-hepatic
- High protein

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
Loss of spaces prevents leakage of serum protein into ascites

Ascitic protein level to differentiate cardiac and cirrhotic portal HTN

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

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 yopokalemia 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

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?

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