ASCITES

INTRODUCTION:

Ascites is an abnormal collection of free fluid in the peritoneal cavity. The term ascites is from Greek origin ‘askos’ meaning bag or bladder.

Diagnostic features of Ascites:
1. Uniform distension of abdomen
2. Flanks full (500ml)
3. Shifting dullness (1000ml)
4. Fluid thrill = massive ascites

Other associated features:
- Everted umbilicus
- Umbilical hernia
- Divarication of recti
- Inguinal or epigastric hernia

Note: Absence of shifting dullness or fluid thrill or absence of both does not exclude the presence of ascites.

Dullness in ascites
- Moderate Ascites - Flanks are dull
- Large ascites (500ml) - Horse shoe shaped dullness
  - Flanks and hypogastric regions are dull
- Massive Ascites - Whole of the abdomen is dull except for a small area over the umbilical region.

Puddles sign: to detect Small volume of ascetic fluid 100ml.
Method to elicit: Patient is put in knee elbow position, keeping the diaphragm of stethoscope over the most dependent part of abdomen, flick on the flank repeatedly and lightly.
Diaphragm is moved gradually to the other flank. A change in the intensity and character of the note indicates fluid.

Shifting dullness: to be elicitable requires minimum of 1000 ml of free fluid

Fluid thrill _elicitable in massive ascites

Mechanism of shifting dullness:
The ascitic fluid will flow to the most dependent portion of the abdomen, the air filled intestine will float on top of this liquid.
The technique of shifting dullness makes use of this relationship to detect the presence of ascitic fluid.

Symptoms of ascites
- Increasing abdominal girth
- Shortness of breath because of elevation of diaphragm - dypnea / orthopnea
- Reflux esophagitis causing heartburn

Secondary effects of ascites:
1. Pleural effusion Rt side: due to defect in diaphragm allowing ascetic fluid to pass into pleural space
2. IVC obstruction: When massive ascites presses on IVC can lead to pedal edema
3. Distended neck veins Elevated Rt. atrial pressure following tense ascites raising the diaphragm

**COMMON CAUSES OF ASCITES**

Hepatic cirrhosis
Malignant diseases (hepatic, peritoneal)
Cardiac failure
TB abdomen

**LEARNING POINTS:**

- Ascites is a sign of ‘decompased ‘liver
- 500ml of fluid should be present before flank dullness is detected.
- Difficult to make out dullness in obese abdomen-diagnose by USG.
- USG can detect as little as 100 ml of fluid in peritoneum
- In ovarian masses characteristically flanks are resonant
- Ascites developing in stable chronic cirrhosis, super imposed Hepatoma to be suspected.
- Malignancy related ascites-painful

---

**CAUSES OF ASCITES**

- **Disease of peritoneum**
  1. Acute peritonitis-pyogenic
  2. Spontaneous bacterial peritonitis
  3. Fungal, parasitic, amoebic filarial
  4. Chronic peritonitis TB
  5. Malignant peritonitis peritoneal carcinomatosis, lymphatic obstruction, hepatic cellular carcinoma, metastasis liver

- **Diseases of portal tract**
  1. Portal vein thrombosis
  2. Portal hyper tension (cirrhotic/non cirrhotic)
  3. Hepatic vein occlusion (Budd-chiari syndrome/veno occlusive diseases
  4. IVC obstruction - Above the level of hepatic vein

- **Systemic disease**
  1. Cardiac constrictive pericarditis, CCF
  2. Renal Nephrotic syndrome, dialysis
  3. Pancreatic-pancreatitis,
  4. G.U. System-Meig’s
  5. Endocrine-hypothyroidism (rare)

- **GENERAL**
  1. Hypoproteinemia
  2. Malnutrition
  3. Protein losing enteropathy
  4. Polyserositis
  5. Familial Mediterranean fever
**History in Ascites**

Chronic alcoholism  
Other Liver diseases risks-transfusion,parenteral therapy,tattoos,accupuncture  
h/o alcoholic cardiomyopathy  
h/o heart disease  
H/o cancer- breast ,colon ,pancratic,gastric  
H/o abdominal pain-malignancy related ascites,pancreatitis,infection  
h/o fever ,abdominal pain-TB abdomen  
h/oDM-nephrotic ascites  
h/o connective tissue disease-polyserositis  
h/o hypothyroidism

**Clinical Examination**

**General examination:** look for  
Stigmata of liver disease-spider nevi,palmar erithema,jaundice  
Raised JVP,anemia,pedal edema  
Virchow’s node-rt supraclavicular region  
Firm umbilical nodule-Sister Mary Joseph’s nodule

**Examination of abdomen**  
**Inspection:** • contour of abdomen, • movements of abdominal wall,  
• Skin stretched and shiny, oedema of skin, • striae, • dilated veins, • position,  
• shape of umbilicus(smiling umbilicus), • herniae(umbilical,epigastric)  
• Transmitted pulsation in ca.stomach,.  

**Palpation**  
• Tenderness, • Rigidity,  
• lump- intra abdominal/on abdominal wall • site,size,shape,surface edges  
• Direction of blood flow in distended veins • viscera-liver,spleen,gall bladder,kidney  
• Hernial orifices  

**Percussion:** • Shifting dullness,fluid thrill,puddles sign  

**Auscultation:** • Hepatic rub, • bruit

**Grading of Ascites**

**GR1+: ONLY ON CAREFUL EXAM**  
**GR2: EASILY DETECTABLE BY SMALL VOLUME**  
**GR3: OBVIOUS ASCITES BUT NOT TENSE**  
**GR4: TENSE ASCITES**

**Ascites Disproportionate to Edema: Coditions Causing**

1. Cirrhosis of Liver  
2. Constrictive Pericarditis  
3. Restrictive Cardiomyopathy  
4. Hepatic Venous Occlusion  
5. Tuberculous Peritonitis  
6. Intra Abdominal Tumor

**Investigations:**  
1. USG ABDOMEN-Confirms ascites  
2. CT Abdomen  
3. Peritoneoscopy
3. LAPROSCOPY and peritoneal biopsy if undiagnosed
4. Diagnostic PARACENTESIS
5. Other routine:
   TC, DC, ESR, X-ray chest, abdomen
6. Liver function tests
7. Liver biopsy-in cirrhosis/malignancy of liver
8. Investigations for diagnosis of portal hypertension

### Differences between transudate and exudate

<table>
<thead>
<tr>
<th>Features</th>
<th>Transudate</th>
<th>Exudate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear</td>
<td>Turbid, hemorrhagic, straw coloured</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>Less than 1.016</td>
<td>More than 1.016</td>
</tr>
<tr>
<td>Proteins</td>
<td>Less than 30 gms/L</td>
<td>More than 30 gms/Litre</td>
</tr>
<tr>
<td>Serum ascitic fluid albumin gradient</td>
<td>&gt;1.1/dl</td>
<td>&lt;1.1/dl</td>
</tr>
<tr>
<td>Total cell count</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Differential count</td>
<td>Mesothelial cells/lymphocytes</td>
<td>Polymorphs, lymphocytes/RBCs</td>
</tr>
</tbody>
</table>

### ASCITIC FLUID ANALYSIS:

**Points to note:**
1. Gross appearance
2. Biochemical analysis
3. Microbiological with cytology

#### Gross appearance

**transudate**
- cloudy
  - a. Infection-raised polymorphs >5000/mm³
  - b. purulent if >50000 cells/mm³
  - c. milky-chylus TGL >200 mg/dl; clears on adding ether
  - d. Deep yellow colour - if bilirubin increased
- bile stained also when there is bile duct perforation
- Blood stained fluid-RBC more than 10 thousand/mm³

**exudate**

**Cell count**
- WBC > denotes inflammation/malignancy
- Mainly polymorphs - Bacterial infection/SBP
- In SBP > 250 cells/mm³ diagnostic
- But in surgical peritonitis > 10 thousand cells/mm³
- Lymphocyte predominance in TB peritonitis
- In malignancy cell type variable; in 20% RBC and also malignant cells seen.

#### Biochemical analysis

*Proteins* > 3 gms/dl in exudates
- SAAB - Serum albumin minus ascitic fluid albumin
- Less than 1.1 in exudates
More than 1.1 in transudate

**Glucose** - reduced or 0- in infected ascites
(Because it is consumed by bacteria and WBC)
Low glucose but normal cell count means intestinal contents aspiration

**Enzymes** - LDH normally less than 50% of serum value
In bacterial infection LDH more than serum value
It is produced by lysed WBCs.
Amylase-raised in pancreatic disease
Normal 250-1000 somayagi units per day

**Bacterial tests**
Gram stain in centrifuged specimens positive in severe infection only.
SBP - not positive because count is low
Culture if done specimen must be sent to the lab immediately.
AFB - often negative

**Cytology for malignant cells**
Positive only if peritoneum is directly involved

**Complications of Ascites**

1. **Spontaneous bacterial peritonitis:**
   Suspect in cirrhosis with ascites, going for fever, abdominal pain, ileus, hypotension, encephalopathy
   Ascitic fluid PMN cell count -> 250/mm³
   Culture positive - enterobacter, strept. pneumonia, S. viridans
   Treatment - Cefatoxime

2. **Hepato renal syndrome**
   Progressive renal failure
   Spontaneous or precipitated by diuresis, paracentesis, bleeding, or drugs.
   ? due to altered renal hemodynamics

**Differential diagnosis for distension of abdomen**
Fluid/Fat/flatus/foetus/Tumor in the abdominal cavity.

**Differential diagnosis of causes of ascites**

1. **Cirrhosis of liver:**
   Signs of liver cell failure
   Signs of portal hypertension
   Ascitic fluid - transudate

2. **Tuberculous peritonitis**
   Doughy abdomen
   Matted omentum and loops of intestine
   Multiple palpable masses
   Confirmation: peritoneal biopsy shows tuberculous granuloma

3. **Bacterial peritonitis**
   Signs of septicemia with ascites
   and a focus of infection like indwelling catheter.
4. Malignant Ascites:
Primary-stomach, colon, ovary, or other intra abdominal tumors,
Sister Joseph nodules in umbilicus

5. Pancreatic ascites
H/o acute abdominal pain radiating to the back
In chronic pancreatitis fluid leaks from the pseudo pancreatic cyst
Serum amylase raised
Ascitic amylase > 1000 lu/L
Diagnosis: ERCP

6. Constrictive Pericarditis
Pulsus paradoxus; kussmauls sign
Hepatomegaly with ascites
Pericardial knock
Calcific pericardium

7. Portal vein thrombosis
Sudden rapid development of ascites, splenomegaly, hematemesis and melena

8. Hepatic vein thrombosis
Large tender liver
Absent hepatojugular reflux

9. Nephrotic syndrome
Initial puffiness of face
Massive proteinuria
Hypercholestrolemia

**Management**
1. Daily weight chart, IO chart,
2. Fluid restriction -1500 ml/day
3. Salt restriction 2 gms per day
4. Diuretics indicated in
   Gross ascites, tense ascites, before biopsy, scan or venogram
   Drugs used
   Spironolactone 25 mg qid,
   Frusemide 20-40 mg in divided doses (may combine with spironolactone)
   Amiloride 10 mg/day ± frusemide/thiazide
5. Paracentesis in severe distension causing respiratory distress
6. Peritoneal shunt in intractable ascites
7. Salt free Albumin infusion
8. Treatment of the cause.