Examination of intra-abdominal lump

Inspection:

- **Position**: lying down supine, relaxed, with the legs semi-flexed.
- **Exposure**: expose the abdomen from the nipple to the mid-thigh

Note the contour of the abdomen

To inspect the contour, imagine a line from the tip of the xiphoid process to the symphysis pubis:

- Scaphoid: if the abdomen lies below this line and is concave
- Normal (flat): if it is along this plane
- Distended (protuberant): if abdomen lies above this plane or convex

If the abdomen is distended note if it is uniform or asymmetrical by comparing both sides to each other

Now inspect the abdomen for:

- Redness, scars
- Striae, Branding marks
- Nodule, Distended veins

Redness

- **Redness** over a lump suggests local inflammation
- **Redness** of skin around the umbilicus in an acute abdomen suggests acute hemorrhagic pancreatitis (Cullen's sign)
- **Branding marks** usually suggest chronic or long-standing pain
- Hard subcutaneous **nodules** suggest secondary spread of the malignancy to the skin (e.g. in carcinoma of stomach)
- **Dilated veins** around the umbilicus with centrifugal flow suggest portal hypertension (caput medusae)
- Vertical femoro-axillary veins are seen in venacaval obstruction

Scars

- If there is a scar of previous operation ask about the nature of the operation
- A scar at McBurney's point is of appendectomy
- A scar below the right costal margin suggests cholecystectomy
- A scar in suprapubic (lower midline) region suggests suprapubic cystolithotomy or prostatectomy
- A scar in the loin region suggests a kidney operation
- Notice the widening of the scar in the central part, ragged white scar suggests wound infection after operation

After inspecting the skin inspect the umbilicus for:

- Is it in the center?
- Is it stretched / everted?
- Is there a hernia?

1) Location of umbilicus

- Normally it is in the midline, midway between the tip of xiphoid process and the top of symphysis pubis
- It is displaces upwards by lumps arising from pelvis
- In ascites the distance between the xiphoid and umbilicus is more than distance between umbilicus and symphysis pubis (Tanyol's sign)

2) Shape of umbilicus

In ascites it maybe transversely stretched (laughing umbilicus)

3) Hernia: In umbilical hernia the umbilicus is everted, we ask the patient to cough to see if there is an expansile impulse indicating an umbilical or para-umbilical hernia.

Now we look for abdominal movements

1. Movements during respiration
2. Visible peristalsis
3. Visible pulsations

1) Movements

- Note abdominal movement during respiration and compare it with chest expansion
    - If thoracic movements are more prominent, it is thoraco-abdominal breathing (common in males)
    - If abdominal movements are more prominent, it is termed as abdomino-thoracic breathing (common in females)
- In peritonitis the abdomen doesn't move during respiration
- In localized peritonitis only the affected portion maybe immobile
- If there is a visible lump (particularly if it is in the upper abdomen) observe whether it moves up and down with each respiration
- Lumps that don't move with respiration:
    - Retroperitoneal lumps
    - Intra-abdominal lumps not connected to the diaphragm

2) Look for visible peristalsis: If the peristaltic movement in the epigastrium moving from left to right (this is a characteristic movement of pyloric stenosis)

Step-ladder pattern of peristalsis showing multiple distended loops rising towards the center, is typical of low ileal obstruction.

3) Visible pulsations

- Aneurysm of abdominal aorta is pulsatile
- If a lump is in the epigastrium and umbilical region which is overlying the abdominal aorta, it may transmit pulsations from abdominal aorta, the lump itself is not pulsatile, these pulsations will disappear in the knee-elbow position when then lump falls away from the aorta.
- In a thin patient pulsations of abdominal aorta maybe visible

After that ask the patient to stand up and check for scrotal swelling

- An epigastric lump that is due to secondary metastasis to the para-aortic lymph nodes maybe caused by a right testicular tumor.
- Then inspect the hernia orifices; ask the patient to cough and look for a coughing pulse
- If a lump is arising from the pelvis or is very large, inspect the legs for edema. Then ask the patient to sit, and standing behind the patient; inspect the spine for any deformity, gibbus, kyphus, kyphosis or scoliosis.
- Inspect the para-spinal area for any para-spinal swelling or sinus
- Paraspinal scar or sinus is very suggestive of TB of spine
- Then inspect the renal angle for fullness
- Then check the left supraclavicular region for a swelling due to enlarged lymph nodes
- Left supra clavicular lymph nodes can be enlarged due to secondary deposits from the malignancy of stomach, colon or testis (Troisier's sign)
- The lymph nodes themselves are termed as Virchow's lymph nodes

Remember to inspect the four extra-abdominal sites:

1. **Scrotum**: while standing
2. **Hernial orifices**: while standing
3. **Spine**: from the backside (paraspinal regions, renal angles)
4. **Virchow's nodes:** Left supra-clavicular nodes

Palpation

- Warm your hands by rubbing them together
- Note the temperature over the site of the lump and compare it with normal and note if there is any local rise in temperature suggestive of acute inflammation in the lump
- Palpate gently with a flat hand (superficial palpation) for:
    - Tone of abdominal wall muscles
    - Tenderness (demarcate the exact location)
    - Normal abdomen is soft, elastic and non-tender

Superficial palpation

1. Warmth and tenderness
2. Area of tenderness
3. Guarding of rigidity
4. Rebound tenderness

- **Guarding**: contraction of abdominal muscles upon palpation
- **Rigidity**: the state of sustained contraction even if we don't palpate (e.g. in acute peritonitis)
- **Rebound tenderness**: if there is a mild local tenderness check for rebound tenderness. Slowly press down your hand over the tender area and withdraw suddenly, if there is acute pain on withdrawal then it is rebound tenderness. Rebound tenderness indicates inflammation of parietal pleura due to an inflamed underlying organ. In intestinal obstruction rebound tenderness suggests strangulation.

Deep Palpation

1. Palpation of the lump
2. Palpation of the rest of the abdomen

1. Before doing palpation of the lump, you should determine:

A. Intra- or extra-abdominal lump
B. Size, shape, consistency, location

A. Intra- or extra-abdominal: (keep your hand on the lower border of the swelling. If the swelling moves with respiration then it is intra-abdominal, if it doesn't it can be parietal or intra-abdominal)

Ask the patient to raise the neck:

- If the swelling becomes less prominent and difficult to palpate then intra-abdominal
- If the swelling becomes more prominent and easier to palpate then extra-abdominal
    - If mobile then subcutaneous
    - If it becomes fixed on contracting the abdominal muscles then intramuscular

B. Palpation in details:

- Measure the **size** in cm
- Note its **location** in relation to:
    - Involved quadrant
    - Costal margin
    - Umbilicus
    - ASIS (Anterior Superior Iliac Spine)
    - Symphysis pubis
- Shape, surface, margin
    - Well-defined margin: neoplasm
    - Ill-defined margin: inflammatory swelling

C. Consistency:

- Soft, cystic, firm or hard
- Uniform or variable
- If cystic test fluctuation and fluid thrill

D. If in lumbar region palpate bimanually

If it is in the right or left hypochondrium; check if it extends under the costal margin and whether fingers can be inserted between it and the costal margin.

E. Mobility

- If the swelling is in the upper half of abdomen check movement with respiration
- Hold the swelling between fingers of both hands and try to move it horizontally and vertically
- If mobile then check restriction of movement in any direction (e.g. an ovarian cyst is mobile in all directions)
- If the swelling is in the flanks then palpate bimanually and check anteroposterior movement and balloatment (only renal lumps are balloatable).

F. Pulsatility

- Put two index fingers on the edge of the swelling
- If the fingers move up and away from each other (expansile pulsation) then it is an aneurysm
- If the fingers only move upwards (transmitted pulsation) then it is a mass
- If in doubt put the patient in knee-elbow position, transmitted pulsation will disappear. An aneurysm will continue to pulsate.

2. Palpation of the rest of abdomen

1. Palpate for liver, spleen and kidneys

2. Note their relation to the lump

Liver

- Start palpating in the right iliac fossa along the mid-clavicular line with the fingers parallel to the liver border exerting moderate pressure during expiration.
- If palpate note the site, border, surface, consistency and tenderness

Spleen

- Start from the right iliac fossa towards the left costal margin with fingers parallel to the left costal margin
- If parallel note its size in cm, then palpate the anterior border for the splenic notch and note that the fingers can't be inserted into the costal margin.
- If not palpable turn the patient to his right side and do bimanual palpation.

Kidney

- Do bimanual palpation in both lumbar regions for renal lump
- If abdomen is thin the lower pole of the right kidney maybe normally palpable

3. Palpate for tenderness over:

- Colon (in the flanks)
- Lower intercostal spaces (in lower chest)
- Renal angles

Check for the testicular tumor

- Note right testicular swelling in a patient with an epigastric lump
- Palpate hernial orifices for hernia (feel cough impulse)
- If lumps arises from the pelvis or from the retroperitoneal space or it is so large as to compress the inferior vena cava then examine the legs for edema (due to compression of the vein or obstruction of lymphatics)

Examine the back

- Palpate the spine for deformity and tenderness
- Look for renal angle tenderness
- Palpate the supraclavicular fossa (especially left) for Virchow's lymph nodes

REVIEW

- Palpation
- Superficial
    - Warmth and Tenderness
    - Area of Tenderness (mark the exact location)
    - Guarding and Rigidity
    - Rebound tenderness
- Deep
    - Palpate the lump
        - Intra- or Extra- abdominal
        - Size, shape, consistency, location
        - If lumbar, bimanual palpation and balloatment
        - Mobility
        - Pulsatility
    - Rest of abdomen
        - Palpate for liver, spleen and kidneys
        - Note their relation to the lump
        - Palpate for tenderness over colon, lower intercostal spaces and renal angles
        - Palpate (Scrotum, Hernial orifices, Back-Spine, paraspinal, Left supra-clavicular nodes)

PERCUSSION

- Percuss on the lump (solid = dull, retroperitoneal and deep = resonant) e.g. resonant note over a renal lump
- If swelling in upper abdomen, note if dullness is continuous with liver or splenic dullness
- Percuss for upper and lower border of liver and measure the liver span
- Confirm mobility of diaphragm by tidal percussion
- Percuss for spleen in the left 9^{th} intercostal space from posterior axillary line forwards
    - If spleen is enlarged the dullness will extend beyond the mid-axillary line
- If a renal lump is suspected percuss posteriorly in the loin, just lateral to erector spinae muscle. Normally this area is resonant due to the presence of the colon. If kidney is enlarged then there will be a dull note but in other lumps like spleen the note remains resonant.
- Percuss from umbilicus to the flanks to detect ascetic fluid. If there is dullness in the flanks try to demonstrate a shifting dullness. Keep the pleximeter finger just lateral to the border of the dullness and roll the patient over to the opposite side, wait for 20 seconds and percuss again. If the note becomes resonant, presence of free fluid in the abdomen is confirmed. Then turn the patient supine again and demonstrate that the note is dull once again. If the dullness extends to both flanks and suprapubic regions, it is termed horseshoe shaped dullness.
- If there is a large ascites or a large cystic lump, percuss for fluid thrill.
- If the lump is suspected to be a hydatid cyst, try to demonstrate a hydatid thrill or the after-thrill.

AUSCULTATION

- Auscultate carefully over the abdomen for abnormal sound and peristalsis
- If the lump is pulsatile auscultate over it first for a bruit
- Auscultate over abdominal aorta and then on the renal arteries for bruit
- If the liver or spleen is enlarged, auscultate them for hepatic rub and splenic rub during deep inspiration
- Auscultate in the peri umbilical area and the right iliac fossa for peristalsis

Lastly do a PR and in females a PV exam