in umbilical region. Visible colonic peristalsis may be obvious from right to left along the line of colon

Inspection of the mass—Its location (exact location should be mentioned as in which region it is located and then its extension into the other region should be mentioned later); extent; approximate size; well defined or ill defined (often mass is not clearly seen but fullness is visible); margins whether clear or not or which part is clear and which part is not; presence of movement of mass with respiration or not (upper abdomen mass like liver, stomach, spleen, gallbladder, omental mass, kidney mass moves with respiration). Mass which was initially mobile may not be mobile later once it gets fixed to retroperitoneum or deeper plane. But occasionally mass which was initially not mobile, may start moving with respiration once gets attached to structures like omentum. Lower abdominal mass, retroperitoneal mass will not usually move with respiration. Mass which comes in close contact with diaphragm will move with respiration. Composite mass may move with respiration because of its component like omentum, lymph nodes, bowel, etc **(Figs 21.8 to 21.10).**

Umbilicus—Position is noted. It may be everted/inverted. *Tanyol sign*: Umbilicus is shifted upwards in pelvic/ovarian mass and downwards in ascites. *Sister Joseph nodules* can occur in the umbilicus as secondaries from abdominal GI malignancies through ligamentum teres. Umbilical black eye is *Cullen's sign* of discolouration of umbilicus seen in acute pancreatitis. Umbilical concretions, umbilical discharge (sinus/fistula), bluish tinge in ruptured ectopic gestation (*Cullen's*), yellow tinge around umbilicus in acute pancreatitis in women (*Johnston*)—should be observed **(Fig. 21.11)**.

Hernial orifices and genitalia inspection—is a must. Scrotum should be examined for testicular tumour/

Fig. 21.8: Visible large upper abdomen mass—could be enlarged liver/pseudocyst of pancreas/retroperitoneal mass.

Fig. 21.9: Large secondaries in liver. Patient has undergone enucleation of left eye (with artificial eye) for primary melanoma choroids—15 years ago. Now he has presented with late large liver secondaries.

Fig. 21.10: Head raising test should be done to find out whether mass is intra-abdominal or in the abdominal wall.

Fig. 21.11: Sister Joseph secondary nodule in the umbilicus.

Fig. 21.12: Impulse on coughing should be seen and also felt to confirm associated hernia.

loss of testicular sensation as testicular tumour may present as epigastric mass due to enlarged para-aortic lymph nodes **(Figs 21.12 and 21.13)**.

Palpation

While palpating the abdomen patient should take deep breath with mouth open to relax the abdomen otherwise it is difficult to get proper finding. Hands should be warm and forearm should be horizontal at the same level as patient's abdomen. Palpation is done with ventral aspect of the fingers. Legs should be partially flexed at hips and knees.

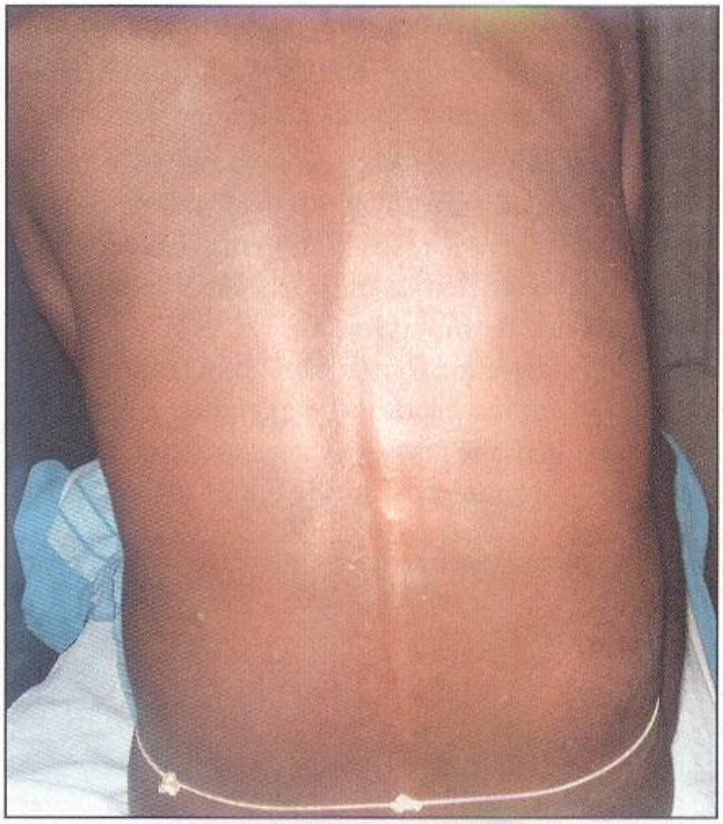


Fig. 21.13: Loin should be inspected from behind for fullness and oedema.

Local rise of temperature is checked using back of hand. It suggests inflammatory pathology.

Tenderness over the abdomen or over the mass must be noted. It may be due to inflammatory pathology. Often malignant condition may cause tenderness either due to secondary infection or due to tumour necrosis.

Position, size, shape, and surface of the mass: Nodular surface may be neoplastic; smooth surface may be of benign or inflammatory pathology.

Margin: Well-defined margin which is distinct may be a feature of neoplasm. Ill-defined margin may be seen in inflammatory or traumatic pathology. Margin which is indistinct whether upper or lower should be confirmed. In the upper abdomen feeling the upper margin is important. In liver mass upper margin is not felt but it is felt in stomach mass. Upper margin of the mass may be difficult to feel in mass from fundus of stomach. Feeling the lower margin is important in the lower abdomen mass . If lower margin is not clear one has to find out whether mass is extending to pelvis or not. Rectal or per vaginal examination confirms the pelvic mass. Often full bladder may interfere or mimic the mass and so mass should be palpated again after emptying the bladder, if needed after passing

a urinary catheter. Margin may be better felt with change in position either sitting, standing, or lateral position.

Mobility of the mass: Mass is held between thumb and fingers and moved in vertical and horizontal directions. If there is restriction in movement, which movement is restricted should be checked. Totally fixed mass will not be mobile at all.

During inspiration (on deep breathing) mass moves down to touch the hand of the examiner kept on the lower margin of the mass. During expiration it moves back to its original position **(Figs 21.14 to 21.16)**.

Fig. 21.14: Checking the temperature of the abdomen using dorsum of the hand.

Fig. 21.15: Palpation of abdominal mass using fingers.

Head raising test or leg raising test (Carnett's test): It is done to confirm whether mass is in the abdominal wall or intra-abdominal. Mass is seen initially and palpated and patient is asked to raise his head along with shoulders with arms folded over the chest. If mass disappears or becomes smaller, it is intra-abdominal mass; if becomes more prominent it is in the abdominal wall. Manoeuvre is done to make the abdominal muscle

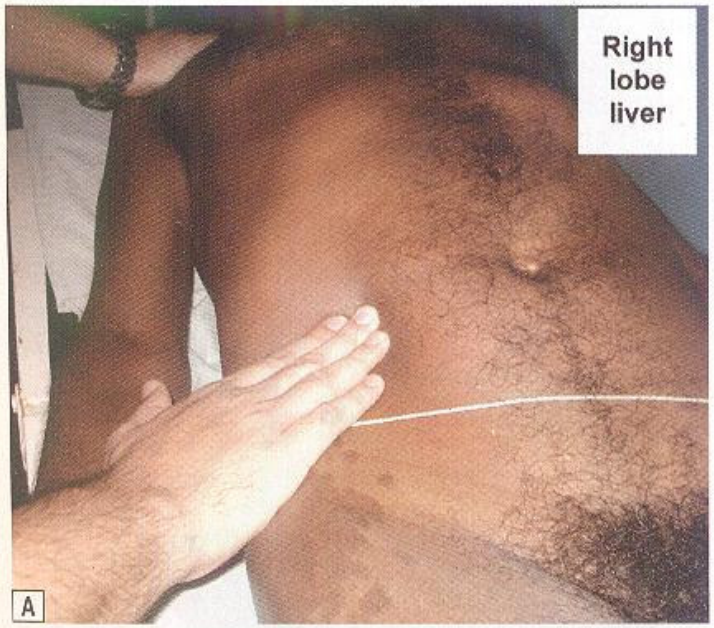
Fig. 21.16: Lower abdominal mass—retroperitoneal tumour/ovarian tumour/uterine mass.

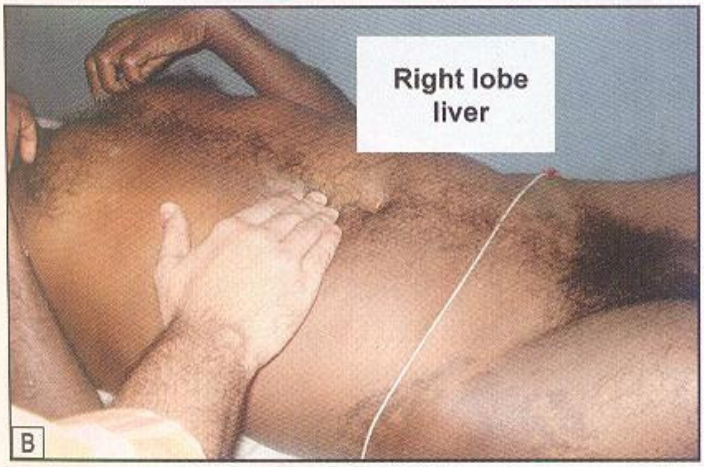
taut. Raising both legs straight above the bed (Carnett's test) can also be used for the same. Air is tried to be blow out by holding the nose tightly with fingers and mouth shut—*Valsalva manoeuvre*. Abdominal wall mass will become prominent and immobile during these manoeuvre.

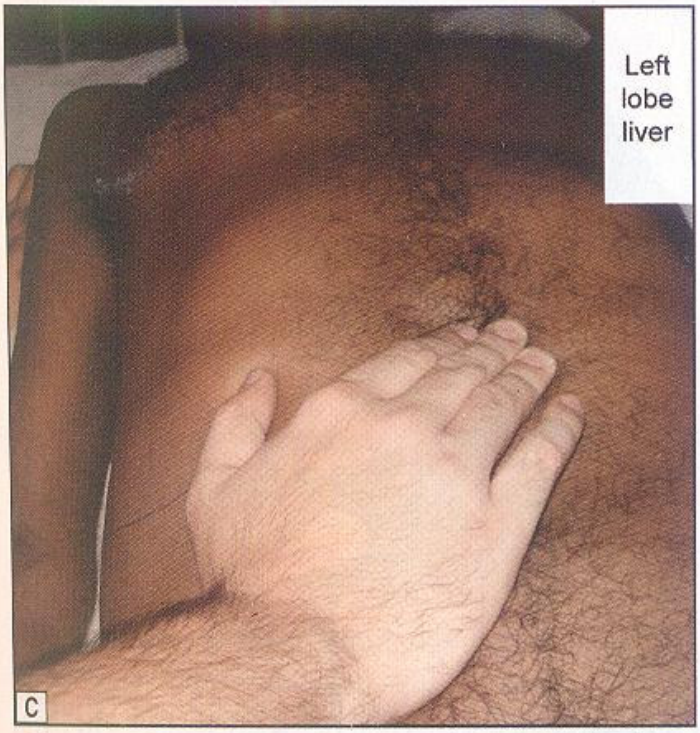
Palpation of Liver

Liver is palpated by placing flat of the hand parallel to the right costal margin—initially near right iliac fossa with fingers directed upwards up to the margin of the right rectus. Slowly with each phase of respiration fingers should be moved upwards towards right hypochondrium to feel the lower margin of the liver. The surface of the liver is then felt for tenderness, nodularity, round/sharp margin. Level of lower margin should be measured in centimeters from right costal margin. In children below 3 years, liver is palpable 3 cm below the right costal margin. Liver is not palpable or just palpable in normal adult. Whenever there is ascites liver is palpated by '*dip method*' - (dipping fingers quickly so as to displace the fluid). Liver may be enlarged *upwards* in hydatid cyst, and liver abscess **(Figs 21.17A to C)**.

Normal liver span in adult is (vertical height) 12-15 cm. Liver span in infant is 2.4-2.8 cm. At the age of 14 years it is 5.5-7.5 cm.







Figs 21.17A to C: Method of palpating the liver right lobe and left lobe.

Palpation of Gallbladder

Normally it is not palpable. When enlarged its lower margin may be in right side of umbilical region/right lumbar region/right iliac fossa. It moves with respiration, globular in shape, smooth and soft, may be horizontally mobile but not vertically, upper margin merges under the liver when liver is enlarged or under the right costal margin. It is usually in right hypochondrium, just right of the right rectus muscle.

Murphy's sign is elicited in sitting position. Patient winces with pain at the summit of inspiration while palpating in gallbladder area. During deep inspiration, inflamed gallbladder comes down and touches the palpating finger (thumb) to cause tenderness. It is observed in chronic cholecystitis. Often it is elicited in lying down position and is called as *Moynihan's sign* (test).

Stomach

Stomach is palpated in the epigastrium. Entire stomach may be dilated and palpable due to gastric outlet obstruction. Succussion splash and auscultopercussion tests should be elicited in such occasion.

Succussion splash: Patient should not take anything orally for 4 hours as gastric emptying time for liquid is 4 hours. If patient drinks fluid succussion splash may be positive even when stomach is not dilated. Bell of the stethoscope is placed in the epigastrium. Two thumbs of the two hands are placed over the bell and fingers of each hand are placed on costal area on each side and shaken well to hear the splashing sound. This can be occasionally elicited by dipping the hand over the dilated stomach also **(Fig. 21.18).**

Auscultopercussion test: It is positive in gastric outlet obstruction. Bell of the stethoscope is placed over the epigastrium. Abdominal wall is scratched using pencil or fingertip by radiating strokes from bell area towards left hypochondrium, left lumbar and left and later towards right part of the umbilical regions. Change in the note of the sound is marked at each stroke line. All these marks are joined to mark the greater curvature of the stomach. By this procedure only greater curvature is assessed. Reasons are—only greater curvature dilates significantly when there is obstruction not lesser curvature, and greater curvature