Examination of the gastrointestinal system

Prof.Dr.Ahmet Dobrucalı

Abdominal symptoms:

Pain:

Here a few minutes of careful history taking may yield more dividends than hours of expensive investigation. Of course, sudden catasthrophic pain, usually the province of the surgeon, demands immediate attention. Intense constant generalized abdominal pain of quick onset often implies perforation of a peptic ulcer, acute pancreatitis or a ruptured aortic aneurysm. Do not forget that the pain of myocardial infarction may be felt in the epigastrium. Waxing and warning pain felt diffusely over the abdomen suggest gut colic, as with intestinal obstruction. If acute colicky pain is associated with diarrhea and vomiting, it is likely to be due to an enteric infesction such as Salmonella. When colicky pains start in the flank and radiate to the lower abdomen or genitalia ureteric colic must be considered. Several upper abdominal pain (some times colicky) radiating to the right upper quadrant and through to the back at the angle of the right scapula suggests biliary pain and gallbladder disease. Acute central abdominal pains shifting after a few hours to the right iliac fossa are likely to be due to appendicitis. Sometimes metabolic disease such as porphyria and diabetic ketoacidosis may present with severe abdominal pain.

Some chronic pains have helpful diagnostic features. Patients with peptic ulcer disease, particularly duodenal ulceration, may have bouts of pain lasting for a few days at a time with complete remissions for weeks or months. This relapsing / remitting pattern may extend over many years and may be accepted by the patient as a normal feature of life. The pain in peptic ulceration is usually epigastric but may radiate through to the back, not infrequently the patient is unable to define its site of origin. Worsening of pain before meals, nocturnal waking and relief with food may characterize duodenal ulceration. Colicky abdominal pains related to disturbances of bowel habit and abdominal distention point to obstructive lesions of the gut such as colonic cancer or Chron's disease. Concurrent weight loss, anaemia and anorexia with abdominal pain should always alert you to the possibility of underlying malignancy.

Remember that the patients from tropical areas may have other causes of abdominal pain that do not necessarily spring to mind when those patients are seen in a western setting. Sickle cell crises, splenic infarcts and amoebic liver abscess must be considered.

Nausea and vomiting:

These common symptoms may be difficult to evaluate. Nausea as an isolated symptom, without vomiting, is much more likely to be due to depression or neurosis than primary gastrointestinal disease. Just 'feeling sick' is often an expression of non-spesific ill-health. When the nause is associated with vomiting careful enquiry must be made about associated symptoms such as weight loss and abdominal pain which may lead on to the diagnosis of peptic ulceration or carcinoma. The vomiting of gastric outlet obstruction is profuse and vomits may contain undigested food taken many hours previously. Substernal burning or heartburn after meals characterizes gastroesophageal reflux; this may be aggravated on lying down or bending over doing such tasks as gardening or bricklaying. The hot burning fluid may regurgitate into the mouth but is rarely actually vomited. Fresh or altered blood (haematemesis) in vomit is usually a serious symptom indicative of ulcerative lesions of the uppergastrointestinal tract as far as the second part of the duodenum. However, severe retching as with an alcoholic binge, may tear the mucosa at the gastroesophageal junction to cause fresh bleeding; this ia known as the Mallory-Weiss syndrome.

Do not forget that recurrent, periodic and sometimes profuse vomiting is a feature of migraine in children and young adults, so it is essential to enquire about associated headaches with the bouts of vomiting. The effortless and unexspected vomiting of raised intracranial pressure is relatively uncommon and is usually accompanied by other more prominent features of the primary disease. Other non gastrointestinal causes of nausea and vomiting include uremia,hypercalcaemia and digoxin toxicity. Do not forget also the possibility of pregnancy as a cause of vomiting in women in the reproductive years.

Problem with swallowing:

Common problems are those of 'food sticking' and pain on swallowing. The term dysphagia is often used by doctors to cover both symptoms but it is better to restrict it to the former. The complaint of food sticking in the throat or gullet must always be taken seriously, particularly when it is of recent onset and of increasing severity. In the second half of life it is often caused by a carcinoma of the pharynx, esophagus or gastroesophageal junction; sometimes as adjacent invading tumour such as a bronchial carcinoma may announce its presence by dysphagia. Chronic and / or intermittent dysphagia may be due to benign oesophageal stricture or achalasia of the cardia. Most

patients with swallowing problems have more difficulty with solids than liquids but sometimes with achalasia the reverse is true. Often patients point to the site of apparent obstruction but this does not always relate accurately to the subsequently demonstrated anatomical site.

Discomfort or pain on swallowing is usually due to esophagitis and it is always important to ask about associated gastroesophageal reflux or heartburn. A not uncommon problem, encountered often in young women of nervous disposition, is an apparent need to swallow frequently to overcome what seems to be an obstruction in the upper gullet. When, as is usually the case, nothing is found to account for this, it is termed globus hystericus.

Choking on swallowing is another serious symptom implying a neurological lesion of the larynx or pharynx or a fistula between the upper gastrointestinal tract and the bronchi or lungs.

Bowels:

The extend to which people inspect their motions or complain about their bowels varies greatly among both individuals and cultures. Nevertheless any changes in bowel habit must be critically assessed bearing in mind the patient's limitations in language, vocabulary and background. For some patients defeacation two to three times each day may be normal whereas in others just two or three bowel actions per week is compatible with compatible with normal health. Remember to ask about medication which may cause altered bowel habit.

The passage of blood and mucus must always be taken seriously except in the context of what is obviously an acute, infective diarrhoea. Fresh blood passed with the stools which spatters the lavatory pan and is present on toilet paper is likely to be due to bleeding piles. However, this diagnosis must only be made after careful examination including sigmoidoscopy. Blood and mucus usually point to chronic inflammatory bowel disease, diverticulitis, polyps or cancers of the colon or rectum. Blood and mucus with diarrhoea and a sensation of incomplete emptying of the rectum is almost pathognomic of a rectal tumor. Ask your patient about the consistency of the diarrhea. Is it watery and very frequent as in colitis?. Are the motions porridgy, bulky, pale and offensive as with steatorrhea? Is nocturnal diarrhoea a problem? Diarrhoea that wakes a patient from sleep is nearly always on an organic basis whereas a flurry of two or three bowel actions on sising in the morning is often of nervous origin. Many text books write of alternating constipation and diarrhoea as being a symptom of colonic cancer; this is rarely so in practice. Long thin stools are also rarely of significance. Some patients may not necessarrily equate the black tarry motion of melena with blood loss and you need to ask about this carefully. Diabetics often have disturbances of bowel function but, of course, they are not immune to other gut disorder such as bowel cancer.

Find out about recent travel in patients from abroad but bear in mind that parasites or infections in the gut may not necessarily be the cause of your patient's symptoms. Remember too that tropical gut infections such as amoebiasis and strongyloidiasis together with other sexually transmitted disesases such as gonorhoea and syphilis may

from part of the ‘gay-bowel’ syndrome in male homosexuals. If in doubt you must ask about sexual proclivities.

Wind:

This is a common dyspeptic symptom not often of great significance. You need to know what your patient really means by it. Mostly flatulance means bringing wind up (belching) and flatus means passing wind down below (farting) but many patients and their doctors may not always be clear what they mean by these terms. Excessive belching usually means that the patient is an airswallwer. Excessive flatus may be due to alactasia but it is rarely a symptom of complaint from those working alone in the open who can with ease and without embarrasement relive themselves! Borborgymi is lovely onomatopoeic word that doctors often use to describe the gurgling and rumbling abdominal noises that arise from peristalting bowel and which may be heard to excess in patients with obstruvting gut lesions.

Heartburn:

Mention has already been made of this symptom which is widely used. Many people correctly recognize the sensation of acid secretions regurgitating into the gullet. Some describe it as waterbrash. Nevertheless it is dangerous to assume that the discomfort that the patient described is, in fact, due to gastro-esophageal reflux. Question your patient carefully and make sure you do not misdiagnose angina

Anatomy and physiology:

For descriptive purposes, the abdomen is often divided into four quadrants by imaginary lines crossing at the umbilicus; right upper, right lower, left upper and left lower quadrants. Another system divides the abdomen into nine sections. Terms for three of them are commonly used; epigastric, umbilical and hypogastric or suprapubic.

When examining the abdomen, you may be able to feel several normal structures. The sigmoid colon is frequently palpable as a firm, narrow tube in the left lower quadrant, while the cecum and part of the ascending colon form a softer, wider tube in the right lower quadrant. Portions of the transverse and descending colon may also be palpable.
None of these structures should be mistaken for a tumor. Although the normal liver often extends down just below the right costal margin, its soft consistency makes it difficult to feel through the abdominal wall. Occasionally, however , it may be palpable. Also in the right upper quadrant, but usually on a deeper level, lies the lower pole of the right kidney. It may be palpable, especially in thin women with relaxed abdominal

muscles. Pulsations of the abdominal aorta are frequently visible and usually palpable in the pulsations of the iliac arteries may sometimes be felt in the lower quadrants.
A distended bladder and a pregnant uterus each may rise above the symphysis pubis. With deep palpation several centimeters below the umbilicus in thin relaxed persons, you can sometimes feel the sacral promontory, the anterior edge of the first sacral vertebra. Until you are familiar with this normal structure, you may mistake its stony hard outlines for a tumor. Another stony hard lump that can sometimes misleaded yoe, and occasionally also alarms a patient who discovers it first, is a normal xiphoid process.

The abdominal cavity extends up under the rib cage to the dome of the diaphragm. In this protected location, beyond the reach of the palpating hand, are much of the liver and stomach and all of the usual normal spleen. The spleen lies against the diaphragm at the level of the $9^{th,}$ 10^{th} and 11^{th} ribs, mostly posterior to the left midaxillary line. It is lateral to and behind the stomach and just above the left kidney. The tip of a normal spleen is palpable below the left costal margin in a small percentage of adults.

Most of the normal gallbladder lies deep to the liver, from which it can not be distinguished clinically. The duodenum and pancreas lie deep in the upper abdomen, where they are not normally palpable.
The kidneys are posterior organs, the upper portions of which are protected by the ribs. The costovertebral angle- the angle formed by the lower border of the 12^{th} rib and the transverse processes of the upper lumbar vertebrae- defines the region to assess for kidney tenderness.

Changes with age:

During the middle and later years, fats tends to accumulate in the lower abdomen and near the hips, even when total body weight is stable. This accumulation, together with weakening of the abdominal muscles, often produces a potbelly. Occasionally a person notes this change with alarm and interprets it as fluid or evidence of disease.
Old age may blunt the manifestations of acute abdominal disease. Pain may be less severe, fever is often less pronounced and signs of peritoneal inflammation, such as muscular guarding and rebound tenderness, may be diminished or even absent.

Techniques of examination:

General approach:

For a good abdominal examination you need (1) good light, (2) a relaxed patient and (3) full exposure of the abdomen from above the xiphoid process to the symphysis pubis. The groins should be visible, although the genitalia should be kept draped. To encourage relaxation;
-The patient should not have a full bladder.

-Make the patient comfortable in a supine position,with a pillow for the head and perhaps another under the knees. You can ascertain whether or not the patients commonly put their arms over their heads, this move should be discouraged because it stretches and tightens the abdominal wall and makes palpation difficult.
-Before palpation, ask the patient to point to any areas of pain and examine painful or tender areas last.
-Monitor your examination by watching the patient's face for signs of discomfort.
-Have warm hands, a warm stethoscope and short fingernails. Rubbing your hands together or running hot water over them may help to warm them. If necessary, you may start your papation through the patient's gown. This contact with the patient's body usually warms your hand and you can then expose the abdomen properly. Anxious examiners, unfortunately, often have cold hands. This problem decreases over time.
-Approach slowly and avoid quick, unexpected movements.
-Distract the patient if necessary with conversation or questions.
-If the patient is very frightened or very ticklish, begin palpation with his or her own hand beneath yours. In a few moments you can slip your hand underneath to palpate directly.

Make a habit of visiualizing each organ in the region you are examining. From the patient's right side, proceed in an orderly fashion; inspection, auscultation, percussion and palpation of the abdomen and assessment of the liver, spleen, kidneys and aorta.

The abdomen:

Inspection:

Starting from your usual stanting position at the right side of the bed, inspect the abdomen. When looking at the contour of the abdomen and watching for peristalsis, it is helpful to sit or bend down so that you can view the abdomen tangentially.
Note;

-The skin, including:
Scars; Describe or diagram their location. Associated herniae must be noted.
Stria; Old silver stria or strecth marks are normal in women who have born children. Pink purple striae are also seen in patients on high dosage steroid therapy and in Cushing's syndrome.
Dilated veins; A few small veins may be visible normally. Distended veins over the lower abdomen with leg oedema may indicate inferior vena caval obstruction, these dilated veins run upwards from the femoral region. Very rarely veins may be seen radiating out from the umbilicus to form the so- called caput Medusae. This unusual physical sign occurs with portal hypertension when anastomoses develop between the portal and systemic circulations along the round ligament of the umbilicus.

Rashes and lesions; Pigmentation around the umbilicus due to altered blood may be seen with intraperitoneal haemorrhage or, more rarely, with carcinoma of the pancreas or acute pancreatitis (Cullen's sign). Another unusual sign in acute haemarrhagic pancreatitis is brusing in the flanks (Grey- Turner's sign).

-**The umbilicus:** Its contour and location and any signs of inflammation or hernia

-**The contour of the abdomen:**

Is it flat,rounded,protuberent or scaphoid (markedly concave or hollowed?)

Do the flanks bulge or are there any local bulges? Include in this survey the inguinal and femoral areas. (Bulging flanks of ascites, suprapubic bulge of a distended bladder or pregnant uterus, hernia)

Is the abdomen symmetrical? (Assymetry due to an enlarged organ or mass).

Are there visible organs or masses? Look for an enlarged liver or spleen that has descendent below rib cage.(Lower abdominal mass of an ovarian or a uterine tumor).

-Peristalsis: Observe for several minutes if you suspect intestinal obstruction. Peristalsis may be visible normally in very thin people.(Increased peristaltic waves of intestinal obstruction).

-Pulsation: The normal aortic pulsation is frequently visible in the epigastrium. (Increased pulsation of an aortic aneurysm or of increased pulse pressure).

Distention of the abdomen:

Swelling of the abdomen is a common symptom that is not necessarily due to serious organic disease. Many patients complain bitterly of abdominal distention that is neither immediately apparent to the examinig doctor nor adequately explained by subsequent investigations. In spite of five F's, fat, fluid, faeces, flatus and fetus, taught to generations of students provides a useful check list. It is worth adding a sixth F – fibroids- as a reminder that massive solid or semisolid tumours some times present with abdominal distention.

Auscultation:

Auscultation of the abdomen is useful in assessing bowel motility and abdominal complaints, in searching for renal artery stenosis as a cause of hypertension and in exploring for other vascular obstructions. You should practice the technique untill you become throughly familiar with normal variations and can listen intelligently when you need to. In most other situations,however, auscultation may safely be omitted.

Listen to the abdomen before percussing and feeling it,because the latter maneuvers may alter the frequency of bowel sounds. Place dhe diaphragm of your stethoscope gently on the abdomen.

Listen for bowel sounds and note their frequency and character. Normal sounds consist of clicks and gurgles, the frequency of which has been estimated at from 5 to 34 per minute.

Occasionally you may hear borborgymi- loud prolonged gurgles of hyperperistalsis- the familiar ‘stomach growling’. Because bowel sounds are widely transmitted through the abdomen, listening in one spot, such as the right lower quadrant, is usually sufficient. (Bowel sounds may be altered in diarrhea, intestinal obstruction, paralytic ileus and peritonitis). Auscultation of the abdomen is particularly useful in acute surgical emergencies where the silent belly indicates ileus due to perforation and / or peritonitis. Bowel sounds are heard normally every few seconds with prolonged gurgles or borborgymi less frequently. These may be excesively loud in intestinal obstruction.

If the patient has high blood pressure,listen in the epigastrium and in each upper quadrant for bruits- vascular sounds resembling heart murmurs. Later in the examination, when the patients sits up, listen also in the costovertebral angles. Epigastric bruits confined to systole may be heard in normal persons. (A bruit in one of these areas that has both systolic and diastolic components strongly suggests renal artery stenosis as the cause of hypertension).
If you suspect arterial insufficiency in the legs, listen for bruits over the aorta, the iliac arteries and the femoral arteries. Bruits confined to systole are relatively common,however, and do not necessarily signify occlusive disease.(Bruits with both systolic and diastolic components suggest the turbulent blood flow of partial arterial occlusion).

If you suspect a liver tumor, gonacoccal infection around the liver or splenic infarction, listen over the liver and spleen for **friction rubs.**
Rarely venous hums may be audible over patent dilated umbilical veins in patients with cirrhosis and portal hypertension. The names of Cruveilher and Baumgarten have been attached to this syndrome.

Percussion:

Percussion helps you to assess the amount and distribution of gas in the abdomen and to identfy possible masses that are solid or fluid filled. Its use in estimating the size of the liver and spleen will be described in later sections.
Percuss the abdomen lightly in all four quadrants to assess the distribution of tympany and dullness. Tympany usually predominates because of gas in the gastrointestinal tract, but scattered areas of dullness due to fluid and feces there are also typical.
(A protuberant abdomen that is tympanitic throughout suggests intestinal obstruction.)
-Note any large dull areas that might indicate an underlying mass or enlarged organ. This observation will guide your palpation (Pregnant uterus, ovarian tumor, distended bladder, large liver or spleen.)
-On each side of a protuberant abdomen, note where abdominal tympany changes to the dullness of solid posterior structures (Dullness in both flanks indicates further assesment for ascites).

Briefly percuss the lower anterior chest, between lungs above and costal margins below. On the right, you will usually find the dullness of liver; on the left, the tympany that overlies the gastric air bubble and the splenic flexure of the colon. (In situs inversus , organs are reversed, air bubble on the right, liver dullness on the left.)

Palpation:

Light palpation:
Feeling the abdomen gently is especially helpful in identifying abdominal tenderness, muscular resistance and some superficial organs and masses. It also serves to reassure and relax the patient.
Keeping your hand and forearm on a horizontale plane, with fingers together and flat on the abdominal surface, palpate the abdomen with a light, gentle, dipping motion. When moving your hand from place to place, raise it just off the skin. Moving smootly, feel in all quadrants.
Identify any superficial organs or masses and any are of tenderness or increased resistance to your hand. If resistance is present, try to distinguish voluntary guarding from involuntary muscular spasm. To do this;
-Try all the relaxing methods you know
-Feel for the relaxation of abdominal muscles that normally accompanies exhalation
-Ask the patient to mouth-breathe with jaw dropped open.
Voluntary guarding usually decreases with these maneuvers. (Involuntary rigidity typically persisits despite these maneuvers. It indicates peritoneal inflammation)

Deep palpation:
Deep palpation is usually required to delineate abdominal masses. Again using the palmar surfaces of your fingers, feel in all four quadrants. Identify any masses and note their location, size,shape, consistency, tenderness, pulsations and mobility (e.g., with respiration or with the examining hand). Correlate your palpable findings with your percussion note. (Abdominal masses may be categorized in several ways; physiologic (pregnant uterus), inflammatory (diverticulitis of the colon), vascular (an aneurysm of the abdomina aorta), neoplastic (carcinoma of the colon) or obstructive (a distended bladder or dilated loop of bowel).
When deep palpation is difficult- as in obesity- use two hands, one on top of the other. Exert pressure with the outside hand while concentrating on feeling with inside hand.

Several structures may be normally palpable in the slim abdomen. In particular a descending colon full of hard faeces may be palpable in the constipated colon full of hard faeces may be palpable in the constipated patient and a tender gurgly caecum may be felt in the right iliac fossa, particularly in women. The caecum is usually larger in women than in men. The sacral promontory can be felt in women with a marked lumbar lordosis.

Assessment for peritoneal irritation:

Abdominal pain and tenderness, especially when associated with muscular spasm, suggest inflammation of the parietal peritoneum. Localize it as accurately as possible. First, even before palpation, ask the patient to cough and determine where the cough produced pain. Thus guided, palpate gently with one finger to map the tender area. Pain produced by light percussion has similar localising value. These gentle maneuvers may be all you need to establish an area mor peritoneal inflammation. (Abdominal pain on coughing or light percussion suggests peritoneal inflammation.)

If not, look for **rebound tenderness**. Press your fingers in firmly and slowly, and then quickly withdraw them. Watch and listen to the patient for signs of pain. Ask the patient 1) to compare which hurt more,the pressing or the letting go, and 2) to show you exactly where it hurt. Pain induced or increased by quick withdrawal constitutes rebound tenderness. It results from the rapid movement of inflamed peritoneum. (Rebound tenderness suggests peritoneal inflammation. If tenderness is felt elsewhere than where you trying to elicit rebound, that area may be the real source of the problem.)

Casuses of a mass in the right iliac fossa

Appendix mass, appendix abcess, Chron disease, carcinoma of caecum, tuberculosis, amoeboma, lymphoma, psoas abscess, mobile ovarian cyst, retroperitoneal tumour, bony tumours, malignat undescended testis, iliac artery aneurysm.

Causes of a mass in the left iliac fossa

Diverticular mass or abscess, faeces in loaded colon, Crohn's disease, lymphoma, psoas abscess, mobile ovarian cyst, retroperitoneal tumour, bony tumours,malignant undescending testis, iliac artery aneurysm.

Central and midline abdominal masses:

Carcinoma of the stomach (often inoperable), carcinoma of the pancreas, primary or secondary tumours in the left lobe of the liver, aortic aneurysm, enlarged paraaortic or mesenteric lymph glands, pancreatic pseudocysts, mesenteric cysts.

The liver:

Because most of the liver is sheltered by the rib cage, assessing it is difficult. Its size and shape can be estimated by percussion and perhaps palpation, however, and the palpating hand may be able to evaluate its surface, consistency, and tenderness.

Percusion:

Measure the vertical span of liver dullness in the right midclavicular line. Starting at a level below the umbilicus (in an area of tympany, not dullness), lightly percuss upward toward the liver. Ascertain the lower border of liver dullness in the midclavicular line.
Next, identify the upper border of liver dullness in the midclavicular line. Lightly percuss from lung resonance down toward liver dullness. Gently displace a woman's breast as necessary to be sure that you start in a resonant area. The course of percussion is shown below. (The span of liver dullness is increased when the liver is enlarged. The span of liver dullness is decreased when the liver is small. It may also be decreased when free air is present below the diaphgram, as from a perforated hollow viscus. Serial observations may show a decreasing span of dullness as a liver, enlarged due to hepatitis or congestive heart failure, improves or, less commonly , as fulminant hepatitis progresses. Liver dullness may be displaced downward by the low diaphgram of chronic obstructive lung disease. Span, however, remains normal.)
Now measure in centimeters the distance between your two points- the vertical span of liver dullnes. It is generally greater in man than in women, in tall people than in short. If the liver seems to b enlarged, outline the lower edge by percussing in other areas.
Although percussion is probably the most accurate clinical method for estimating the vertical size of the liver, it typically leads to underestimation. (Dullness of a right pleural effusion or consolidated lung, if adjacent to liver dullness, may falsely increase the estimated liver size. Gas in the colon may produce tympany in the right upper quadrant, obscure liver dullness and falsely decrease the estimated liver size)

Causes of reduced liver dullness:
-Small liver; Cirrhosis, hepatic necrosis
-Overinflated lungs; Asthma, emphysema, paralysed right diaphragm
-Gas over liver; Perforated viscus, loop of colon (Chiliadity's syndrome).

Palpation:

Place your left hand behind the patient, parallel to and supporting the right 11'th and 12'th ribs and adjacent soft tissues below. Remind the patient to relax on your hand if necessary. By pressing your left hand forward, the patient's liver may be felt more easily by your other hand.

Place your right hand on the patient's right abdomen lateral to the rectus muscle, with your fingertips well below the border of liver dullness.
Some examiners like to point their fingers up toward the patient's head, while others prefer a somewhat more oblique position. In either, press gently in and up, than ask the patient to take a deep breth. On inspiration, the liver below is palpable about 4 cm below the right costal margin in the midclavicular line.
Try to feel the liver edge as it comes down to meet your fingertips. If you feel it, lighten the pressure of your palpating hand slightly so that the liver can slip under your finger pads and you can feel its anterior surface. Note any tenderness. If palpable at all, the edge of a normal liver is soft, sharp and regular, its surface smooth. The normal liver may be slightly tender. (Firmness or hardness of the liver, bluntness or rounding of its edge and irregularity of its contour suggest an abnormality of the liver.)

Stigmata of chronic liver disease:

Face
- Scleral isterus
- Telangiectasia
- Xanthelasma (Prolonged cholestasis)
- Paper money sign
- Kayser-Fleisher rings (Wilson disease)
- Cushingoid facies (Alcoholic liver disease)

Hands
- Clubbing
- White nails (Leuconychia)
- Liver palms
- Dupuytren's contracture (Alcoholic liver disease)

Skin
- Spider naevi
- Scantly body hair
- Slaty-grey pigmentation (Haemochromatosis)
- Scratch marks (Cholestasis)

Endocrine
- Gynaecomastia
- Atrophic testes

Physical signs with main types of jaundice:

Haemolysis
- Pallor, lemon-yellow tinge, often splenomegaly, other features of haemolytic anemia eg. Leg ulcers in haemoglobinopathies

Acute hepatocellular damage eg. Infective hepatitis

Usually jaundice only, liver may be enlarged and tender,spleen may be palpable

Chronic hepatocellular damage eg. Cirrhosis

Usually stigmata of chronic liver disease, hepatosplenomegaly, leg edema, ascites,

Cholestasis due to extrahepatic biliary obstruction

May progress to olive green jaundice, scratch marks, palpable gall bladder if obstruction due to carcinoma of pancreas, tender distended liver.

When cholestatic jaundice is due to an obstruction at the lower end of the common bile duct, as with carcinoma of the pancreas or cholangiocarcinoma, the gallbladder may be palpably distended. Courvoisier's law states that when the gallbladder is palpable the jaundice is unlikely to be due to stones as gallbladder wall, in the presence of gallstones, would be fibrotic and non-distendible. The converse of the law, ie. Obstructive jaundice without a palpable gallbladder does not necessarily imply that the jaundice is due to stones. A stone in the neck of the gallbladder may cause a distended mucocele of the gallbladder.

The spleen:

Vhen a spleen enlarges, it does so anteriorly, downward and medially, often replacing the tympany of stomach and colon with the dullness of a solid organ. It then becomes palpable below the costal margin. Percussion cannot confirm splenic enlargement but can raise suspicions of it. Palpation can confirm the enlargement, but often misses large spleens that do not descent below the costal margin.

Percussion:

Two techniques may help you to detect splenomegaly, an enlarged spleen;

-Percuss the left lower anterior chest wall between lung resonance above and the costal margin below (an area termed Traube's space). As you percuss along this space, note the lateral extent of tympany.

This is variable, but if tympany is prominent, especially laterally, splenomegaly is not likely. The dulness of a normal spleen is usually hidden within the dullness of other posterior tissues. (Fluid or solids in the stomach or colon may also cause dullness in Traube's space).

-Check for a splenic percussion sign. Percuss the lowest interspace in the left anterior axillary line. This area is usually tympanitic. Then ask the patient to take a deep breath, and percuss again. When spleen size is normal, the percussion note usually remains tympanitic. (A change in percussion note from tympany to dullness on inspiration suggests splenic enlargement. This is a positive splenic percussion sign)

If either or both of these tests is positive, pay extra attention to palpating the spleen. (The splenic percussion sign may also be positive when spleen size is normal)

Palpation:

With your left hand, reach over and around the patient to support and press forward the lower left rib cage and adjacent soft tissue. With your right hand below the left costal margin, press in toward the spleen. Begin palpation low enough so that you are below a possibly enlarged spleen. Begin palpation low enough so that you are below a possibly enlarged spleen. (If your hand is close to the costal margin, moreover, it is not sufficiently mobile to reach up under the rib cage.) Ask the patient to take a deep breath. Try to feel the tip or edge of the spleen as it comes down to meet your fingertips. Note any tenderness, assess the splenic contour, and measure the distance between the spleen's lowest point and the left costal marging. In a small percentage or normal adults, the tip of the spleen is palpable. Causes include a low, flat diaphragm, as in chronic obstructive pulmonary disease, and a deep inspiratory descent of the diaphragm. (An enlarged spleen may be missed if the examiner starts too high in the abdomen to feet the lower edge. A palpable spleen tip, though not necessarly abnormal, may indicate splenic enlargement. The spleen tip below is just palpable deep to the left costal margin.)
Repeat with the patient lying on the right side with legs somewhat flexed at hips and knees. In this position, gravity may bring the spleen forward and to the right into a palpable location. (The enlarged spleen below is palpable about 2 cm below the left costal margin on deep inspiration)

Causes of splenomegaly

<u>Infective</u>

Glandular fever, infective hepatitis, subacute bacterial bacterial endocarditis, malaria, Kala-azar, tropical splenomegaly, enteric fevers

<u>Congestive</u>

Cirhosis, Bilherzia, portal + splenic vein thrombosis

<u>Haematological</u>

Acute leukemia, chronic granulocytic + lymphatic leukaemia, myelosclerosis, hereditary spherocyrosis, thalassaemia, lymphoma.

<u>Infiltrations</u>

Sarcoidosis, amyloidosis, Gaucher disease

<u>Others</u>

Cysts, tumours, Felty's syndrome

Special Techniques:

To assess possible ascites:

A protubarent abdomen with bulging flanks suggests the possibility of ascitic fluid. Because ascitic fluid characteristically sinks with gravity while gas-filled loops of bowel float to the top, percussion gives a dull note in dependent areas of the abdomen. Look for such a pattern by percussing outward in several directions from the central area of tympany. Map the border between tympany and dullness.
To further techniques help to confirm the presence of ascites, although both signs may be misleading.

1- Test for **shifting dullness**: After mapping the borders of tympany and dullness, ask the patients to turn onto one side. Percuss and mark the borders again. In a person without ascites, the borders between tympany and dullness usually stay relatively constant. In ascites, dullnes shifts to the more dependent side, while tympany shifts to the top. Shifting dullness requires at least 500ml fluid to be present. With the patient in the knee elbow position a puddle of ascitic fluid accumulates in the most dependent part of the belly and may be percussed out. 150-200 ml ascites can be detected with using this method. **(puddle sign)**

2- Test for a **fluid wave:** Ask the patient or an assistant to press the edges of both hands firmly down the midline of the abdomen. This pressure helps to stop the transmission of a wave through fat. While you tap one flank sharply with your fingertips, feel on the opposite flank for an impulse transmitted through the fluid. Unfortunately, this sign is often negative untill ascites is obvious and it is sometimes positive in people without ascites.

Causes of ascites

<u>Associated with chronic disease</u>

Cirrhosis of liver, heart failure, abdominal malignancy, liver disease without cirrhosis, hepatic vein occlusion, constructive pericarditis, polserositis (eg, SLE), nephrotic syndrome, infections (eg, Tbc), pancreatitis.

<u>Associated with acute abdomen</u>

Trauma (haemoperitoneum), bacterial peritonitis, acute pancreatitis.

To identify an organ or a mass in an ascitic abdomen:

Try to ballote the organ or mass, exemplified here by an enlarged liver. Straighten and stiffen the fingers of one hand together, place them on the abdominal surface, and make a brief jabbing movement directly toward the anticipated structure. (The quick movement often displaces the fluid so that your fingertips can briefly touch the surface of the structure through the abdominal wall)

To assess possible appendicitis:

-Ask the patient to point to where the pain began and where it is now. Ask the patient to cough. Determine whether and where pain results. (The pain of appendicitis classically begins near the umbilicus and then shifts to right lower quadrant , where coughing increases it. Elderly patients report this pattern less frequently than younger ones)
-Search carefully for an area of local tenderness. (Localised tenderness anywhere in the right lower quadrant, even in the right flank, may indicate appendicitis.)
-Feel for muscular rigidity. (Early voluntary guardinmg may be replaced by involuntary muscular rigidity.
-Perform a rectal examination and, in women, a pelvic examination. These maneuvers may not help you to discriminate well between a normal and an inflamed appendix, but they may help to identify an inflamed appendix atypically located within the pelvic cavity. They may also suggest other causes of the abdominal pain. (Right sided rectal tenderness may be caused by, for example inflamed adnexa or an inflamed seminal vesicle, as well as by an inflamed appendix.

Some additional techniques are sometimes helpful;

-Check the tender area for **rebound tenderness** (If other signs are typically positive, you can save the patient unnecessary pain by omitting this test) (Rebound tenderness suggests peritoneal inflammation, as from appendicitis.)
-Check for **Rowsing's sign** and for referred rebound tenderness. Press deeply and evenly in the left lower quadrant. Then quickly withdraw your fingers. (Pain in the right lower quadrant during left sided pressure sufgests appendicitis (a positive Rovsing's sign). So does right lower quadrant pain on quick withdrawal (referred rebound tenderness)
-Look for a **psoas sign.** Place your hand just above the patient's right knee and ask the patient to raise that thigh against your hand. Alternatively, ask the patient to turn onto the left side. Then extend the patient's right leg at the hip. Flexion of the leg at the tip makes the psoas muscle contract; extension stretches it. (Increased abdominal pain on either maneuver constituess a positive psoas sign, suggesting irritation of the psoas muscle by an inflamed appendix.
-Look for an **obturator sign.** Flex the patient's right thigh at the hip, with the knee bent and rotate the leg internally at the hip, with the knee bent and rotate the leg internally at the hip. This maneuver stretches the internal obturator muscle. (Right hypogastric pain constitutes a positive obturator sign, suggesting iritation of the obturator muscle by an inflamed appendix.)
-Test for **cutaneous hyperesthesia.** At a series of points down the abdominal wall, gently pick up a fold of skin between your thumb and index finger, without pinching it. This maneuver should not normally be painful.

To assess possible acute cholecystitis:

When right upper quadrant pain and tenderness suggest acute cholecystitis, look for ***Murphy' sign***. Hook your thumb of fingers under the liver edge at a comparable point below. Ask the patient to take a deep breath. Watch the patient's breathing and note the

degree of tenderness. (a sharp increse in tenderness with a sudden stop in inspiratory effort constitutes a positive Murphy's sign of acute cholecystitis. Hepatic tenderness may also increase with this maneuver, but is usually less well localised.)

To distinguish an abdominal mass from a mass in the abdominal wall:

An occasional mass is in the abdominal wall rather than inside the abdominal cavity. Ask the patient either to raise the head and shoulders or to strain down, thus tightening the abdominal muscles. Feel for the mass again. (A mass in the abdominal wall remains palpable, an intraabdominal mass is obscured by muscular contraction.)

Rectal examination:

The anus and rectum may be examined with the patient in one of several positions. For most purposes, the side-lying position is satisfactory and allows god views of the perineal and sacrococcygeal areas. This is the position described below. The lithotomy position may help you to reach a cancer high in the rectum. It also permits a bimanual examination, enabling you to delinate a pelvic mass. Some clinicians prefer to examine a patient while he stands with his hips flexed and his upper body resting across the examining table.

Ask the patient to lie on his left side with his buttocks close to the edge of the examining table near you. Flexing the patient's hips and knees, especially in the top leg, stabilizes his position and improves visibility. Drape the patient appropriately and just the light for the best view. Glove your hands and spread the buttocks apart.

Inspect the sacrococcygeal and perianal areas for lumps, ulcer, inflammation, rashes or excoriations. Adult perianal skin is normally more pigmented and some what coarser than skin over the buttocks. Palpate any abnormal areas, notting lumps or tenderness.

Examine the anus and rectum. Lubricate your gloved index finger, explain to the patient what you are going to do, and tell him that the examination may make him feel as if he were moving his bowels but that he will not do so. Ask him to strain down. Inspect the anus, noting any lesions. (Anal and perianal lesions include hemorrhoids, venereal warts, herpes, syphilitic chancr and carcinoma. A perianal abcess produces a painful, tender, indurated and reddened mass. Pruritus ani causes swollen, thickened fissures skin with excoriations.

As the patient strains, place the pad of your lubricated and gloved index finger over the anus. As the sphincter relaxes, gently insert your fingertip into the anal canal, in the anal canal, in a direction pointing toward the umbilicus. (Soft, pliable tags of redundant skin at the anal margin are common. Though sometimes due to past anal surgery or previously thrombosed hemorrhoids, they are often unexplained.

If you feel the sphincter tighten, pause and reassure the patient. When in a moment the sphincter relaxes, produceed. Occasionally, severe tenderness prevents you from examining the anus. Do not try to force it. Insteadi place your fingers on both sides of the

anusi gently spread the orifice and ask the patient to strain down. Look for a lesion, such as an anal fissurei that might explain the tenderness.

If you can proceed without undue discomfort, note;
-The sphincter tone of the anus. Normally, the muscles of anal sphincter close around your finger.
-Tenderness if any
-Induration
-Irregularities or nodules

Insert your finger into the rectum as far as possible. Rotate your hand clockwise to palpate as much of the rectal surface as possible on the patient's right side, then counterclockwise to palpate the surface posteriorly and the patient's left side.
Note any nodules, irregularities or induration. To bring a possible lesion into reach, take your finger off the rectal surface, ask the patient to strain down and palpate again.
Than rotate your hand further counterclockwise so that your finger can examine the posterior surface of the prostate gland. By turning your body somewhat away from the patient, you can feel this area more easily.
Tell the patient that you are going to feel his prostate glandi and that it may make him want to urinate but he will not do so. Sweep your finger carefully over the prostate gland , identifiying its lateral lobes and the median sulcus between them. Note the size, shape and consistency of the prostate and identify any nodules or tenderness. The normal prostate is rubbery and nontender.
If possible, extend your finger above the prostate to the region of the seminal vesicles and the peritoneal cavity. Note nodules or tenderness.
Gently withdraw your finger and wipe the patient's anus or give him tissues to do it himself. Note the color of any fecal matter on your glove, and test it for occult blood.

References:

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