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Class ID: 14077

Course Title: Regional and Radiological Anatomy 1

Final-Term Examination (Summer-2020)

Lect: Mr. Waqas Ihsan

Q1.Write a note on Suprarenal glands.

The adrenal (or suprarenal) glands are paired endocrine glands situated over the medial aspect of the upper poles of each kidney.

They secrete steroid and catecholamine hormones directly into the blood.

Anatomy of the Adrenal Glands

An adrenal gland is made of two main parts:

The adrenal cortex is the outer region and also the largest part of an adrenal gland. It is divided into three separate zones: zona glomerulosa, zona fasciculata and zona reticular is. Each zone is responsible for producing specific hormones.

The adrenal medulla is located inside the adrenal cortex in the centre of an adrenal gland. It produces “stress hormones,” including adrenaline.

The adrenal cortex and adrenal medulla are enveloped in an adipose capsule that forms a protective layer around an adrenal gland.

Anatomical location

The adrenal glands are located in the posterior abdomen, between the superomedial kidney and the diaphragm. They are retroperitoneal, with parietal peritoneum covering their anterior surface only.

The right gland is pyramidal in shape, contrasting with the semi-lunar shape of the left gland.

Perinephric (or renal) fascia encloses the adrenal glands and the kidneys. This fascia attaches the glands to the crura of the diaphragm. They are separated from the kidneys by the perirenal fat.

Vasculature :

Superior adrenal artery

Middle adrenal artery

Interior adrenal artery

Innervation:

Plexus and greater splanchnic nervous.

Q2.What do you know about Ureteric calculus? Also explain the shape of bladder?

ANS :

Ureteric calculus

Ureterolithiasis or ureteric calculi are stones that form in or travel down to the ureters, which are the slender muscular tubes that connect the kidneys to the urinary bladder. These tubes are physiologically constricted at 3 points along their lengths, namely at the ureteropelvic junction, entry into the pelvis as they cross the bifurcation of the common iliac artery and the ureterovesical junction.

As a consequence, these points are the commonest sites where ureteric calculi may become impacted. This may cause several signs and symptoms that may be site-specific as well as related to the degree of urinary obstruction.

Patients may present with nausea, vomiting, blood in the urine and pain in the back, flank and lower abdomen. This pain is usually colicky in nature, which means that it presents in a pattern of waves owing to the peristalsis of the ureters. However, it may also be constant

Epidemiology:

The lifetime prevalence of ureteric calculi is relatively high, occurring in approximately 12% of men and 7% of women 1. The risk is increased with a past history of ureteric calculi and with positive family history. Most patients present between ages 30 and 60 years 2, with peak incidence between ages 35-45. Initial calculus presentation occurring past age 50 is uncommon

Radiographic features:

Plain radiograph

(A plain abdominal (KUB) film)

CT (kub CT)

Ultrasound.

Shape of bladder

Pear-shaped (or teardrop-shaped) bladder is one whose normal round or ovoid shape has been extrinsically compressed to resemble a pear. The pear may be inverted or upright, depending on how the excess pelvic tissue compresses the bladder.

Pathology

Etiology

Causes of a pear-shaped bladder include:

pelvic fluid

pelvic hematoma:

the original description of the inverted pear-shaped bladder was in patients with pelvic trauma and hematoma; it can also be seen in patients receiving anticoagulation therapy

Bilateral lymphoceles:

may develop following radical pelvic lymph node dissection

extravasated urine / bilateral urinomas abscess

Pelvic lipomatosis:

non-malignant overgrowth of fat around the bladder that causes an inverted pear-shaped bladder

vascular dilatation

bilateral iliac artery aneurysms; upright pear-shape

inferior vena cava (IVC) occlusion

causes formation of collateral vessels that compress the bladder and form an inverted pear-shaped bladder; in the days of intravenous urograms, the combination of a renal mass and a pear-shaped bladder was a red flag for renal cell carcinoma involving the renal vein and IVC 2

symmetric lymph node enlargement, e.g. lymphoma, leukemia psoas muscle hypertrophy upright pear-shape: especially in people with narrow pelvises

a ratio of the (sum of the widths of the two psoas muscles):(the pelvic width) >0.98 predisposes to bladder compression.

Q3.Briefly explain the anatomy of duodenum.

ANS:

Duodenum is the first part of the small intestine and is the continuation of the stomach

Gross anatomy

The duodenum is a 20-30 cm C-shaped hollow viscus predominantly on the right side of the vertebral column. It lies at the level of L1-3 and the convexity of the duodenum (called the duodenal sweep by radiologists) usually encompasses the head of the pancreas.

The duodenum begins at the duodenal bulb and ends at the ligament of Treitz, where it continues as the jejunum (this is often called the duodenojejunal (DJ) flexure). It is composed of four distinct parts and is neither wholly peritoneal nor retroperitoneal.

Segments

First part (**D1**)

The first (superior) part of the duodenum begins as a continuation of the duodenal end of the pylorus. It passes laterally to the right, superiorly and posteriorly, for approximately 5 cm, before

making a sharp curve inferiorly into the superior duodenal flexure. It is intraperitoneal for the first 2-3 cm only.

Relations

anteriorly: gallbladder, liver

posteriorly: common bile duct, portal vein, gastroduodenal artery

superiorly: epiploic foramen

inferiorly: pancreatic head

Second part (**D2**)

The second (descending) part of the duodenum begins at the superior duodenal flexure. It passes inferiorly to the lower border of vertebral body L3, before making a sharp turn medially into the inferior duodenal flexure, the end of the descending part.

Relations

anteriorly: transverse mesocolon

posteriorly: right kidney, right ureter, right adrenal gland

superiorly: liver, gallbladder (variable)

inferiorly: loops of jejunum

laterally: ascending colon, hepatic flexure, right kidney

medially: pancreatic head

The pancreatic duct and common bile duct enter the descending duodenum through the major duodenal papilla (ampulla of Vater). This part of the duodenum also contains the minor duodenal papilla, the entrance for the accessory pancreatic duct. The junction between the embryological foregut and midgut lies just below the major duodenal papilla.

Third part (**D3**)

The third (inferior/horizontal) part of the duodenum begins at the inferior duodenal flexure and passes transversely to the left, crossing the vertebral column.

Relations

anteriorly: small bowel mesentery root

posteriorly: right psoas muscle, right ureter, gonadal vessels, aorta and IVC

superiorly: pancreatic head

inferiorly: loops of jejunum

Fourth part (**D4**)

The fourth (ascending) part passes superiorly, either anterior to, or to the left of, the aorta, until it reaches the inferior border of the body of the pancreas. Then, it curves anteriorly and terminates at the duodenojejunal flexure where it joins the jejunum. The duodenojejunal flexure is surrounded by a peritoneal fold containing muscle fibers: the ligament of Treitz.

Relations

superiorly: stomach

inferiorly: loops of jejunum

posteriorly: left psoas muscle, aorta

Venous drainage

Superior pancreaticdudenal vein

Inferior

Pancreaticdudenal vein

Arterial supply

Right gasteric arteri

Right gastroepiploic artry

Branch of gastroduodenal artery.

Q4.Explain the anatomy of Spleen.

ANS. Spleen

The spleen is an organ of the hematological system and has a role in immune response, storage of red blood cells and hematopoiesis

Anatomy

The spleen is a wedge-shaped organ lying mainly in the left upper quadrant (left hypochondrium and partly in the epigastrium) and is protected by the left 9th to 11th ribs. It is soft, highly vascular and dark purple in colour.

Size and weight vary from person-to-person but on average is around 2.5 cm thick, 7.5 cm broad and 12.5 cm in length. For pediatric measurements, see the article spleen size (pediatric)

The spleen has two poles (superior and inferior), three borders (superior, inferior and intermediate) and two surfaces (diaphragmatic and visceral). It is enclosed by a thin capsule, which is easily ruptured.

The spleen is completely covered by peritoneum, except at the hilum, which forms a number of ligaments

Relations

diaphragmatic surface (superoposteriorly): dome of the left hemidiaphragm, left 9th to 11th ribs.

visceral surface (anteromedially)

pancreatic tail

left kidney and adrenal gland

stomach

Ligaments

gastrosplenic ligament

attaches the spleen to the greater curvature of the stomach

contains short gastric and left gastroepiploic arteries

splenorenal ligament

attaches the spleen to the left kidney

contains splenic artery and vein and the pancreatic tail

Arterial supply

splenic artery

Venous drainage

splenic vein

Lymphatic drainage

from splenic hilar lymph nodes to retropancreatic lymph nodes, then draining to celiac lymph nodes

Innervation

sympathetic fibers from the celiac plexus (influence blood flow) parasympathetic innervation from the vagal trunk.

Q5.What do you know about Gall bladder.Explain

ANS: Gall bladder

The gallbladder is a pear-shaped musculomembranous sac located along the undersurface of the liver. It functions to accumulate and concentrate bile between meals

Anatomy

Macroscopic

The normal adult gallbladder measures from 7-10 cm in length and 3-4 cm in transverse diameter 6. The gallbladder communicates with the rest of the biliary system by way of the cystic duct, with bidirectional drainage of bile to and from the common hepatic duct.

For descriptive purposes, it may be divided into the following segments 6:

fundus

body

infundibulum: tapered segment between body and neck

Hartmann pouch: small outpouching, variably identified, at the infundibulum

neck: communicates with the cystic duct

The gallbladder is closely apposed to the liver within the fossa. Indeed, the liver's serosal covering (visceral peritoneum) extends over and completely covers the free surface of the gallbladder 4,6. The gallbladder connects to the liver via a layer of dense connective tissue (adventitia), which contains small draining cystic veins, autonomic innervation, lymphatic drainage, and variable accessory bile ducts (of Lushka) 4,6. In some cases, the gallbladder "hangs" from the liver from a short mesentery of redundant connective tissue

Relations

superiorly: visceral surface of the liver, anterior abdominal wall

inferiorly:

transverse colon, second part of the duodenum (or pylorus of the stomach)

anteriorly:

visceral surface of the liver, transverse colon, 9th costal cartilage

posteriorly:

right kidney, distal first part and proximal second part of the duodenum

medially:

first part of the duodenum, free margin of the lesser omentum and epiploic foramen

laterally: right lobe of the liver

Function

The gallbladder is involved in the storage, concentration, and ejection of the bile.

The adult gallbladder holds ~30-50 mL of bile when distended 4-6, although if obstructed can distend to accommodate up to 300 mL 2.

The gallbladder concentrates bile using mechanism of active transport of sodium and chloride, effectively removing water and slightly increasing acidity of bile. The net effect is a 10-fold increase in bile salt concentration during storage 7.

In response to the detection of ingested fat, gallbladder contraction is signaled by way of a neurohormonal pathway that results in prompt excretion of the biliary payload.

Arterial supply

The gallbladder receives the vast majority of its arterial blood from the cystic artery.

Innervation

Celiac plexus

Branches of anterior vagal trunk

THE END .....