Role of Multislice Computed Tomography (CT) In Evaluation of Gastric Tumors

Essay

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بسم الله الرحمن الرحيم

وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ
عَمَلَكُمْ وَرَسُولُهُ
وَالْمُؤْمِنُونَ

صدق الله العظيم

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Anatomy of the stomach

The stomach is a muscular bag, fixed at both ends and mobile elsewhere. Much of it lies under cover of the lower ribs. The stomach is the most dilated part of the alimentary canal and is situated between the oesophagus and the small intestine. It lies in the epigastric, umbilical and left hypochondrial areas of the abdomen, occupying a recess bounded by the upper abdominal viscera and completed above and anterolaterally by the anterior abdominal wall. ***(McMinn, 1999).***

Its shape and position are modified by intrinsic changes and by changes in the surrounding viscera. Its mean capacity varies from about 30 ml at birth, increasing to 1000 ml at puberty and about 1500 ml in adults. It has two openings and is described as if it had two borders or curvatures and two surfaces. ***(Peter et al, 1995) .***

The Gastric Orifices :

The opening from the oesophagus into the stomach is the cardiac orifice, situated to the left of the midline behind the seventh costal cartilage, 2.5cm from its sternal junction at the level of the eleventh thoracic vertebra . It is about 10 cm from the anterior abdominal wall and 40 cm from the incisor teeth . The right side of the oesophagus is continued with the lesser curvature, while its left side joins curvature at an acute angle, the cardiac notch or incisure. The part of the stomach above the level of the cardia is the fundus. ***(Peter et al, 1995).***

The pyloric orifice is the opening into the duodenum, is usually indicated by a circular pyloric constriction on the surface of the organ, indicating the pyloric sphincter, which can be identified by the prepyloric vein of Mayo crossing it's anterior surface vertically.

The pyloric orifice is about 1.2 cm right of the midline in the transpyloric plane (level of the lower border of the first lumbar vertebra), with the body supine and the stomach empty. ***(McMinn,1999).***

The Gastric Curvatures

١. The Lesser Curvature :

Extending between the cardiac and pyloric orifices, it is the right border of the stomach. It descends from the right side of the oesophagus in front of the decussating fibers of the right crus, curving to the right below the omental tuberosity of the pancreas to end at the pylorus. In the most dependent part may be the angular incisure, varying in position with gastric distension, it is sometimes used to define the right and left parts of the stomach. The lesser omentum is attached to the lesser curvature and contains the right and left gastric vessels near the curvature. ***(McMinn, 1999).***

٢. The Greater Curvature :

Directed antero-inferiorly and is 4 – 5 times as long as the lesser curvature. It starts from the cardiac incisure and arches upwards posterolaterally, the fundus level at the left 5th intercostals space just below the left nipple in males from this level it sweeps down and forwards, almost as far as the 10th costal cartilage in the supine body.

It finally turns right to end at the pylorus. Opposite the angular incisure of the lesser curvature, the greater curvature presents a bulge, taken as the left limit of the pyloric part of the stomach. Its right limit being a slight groove **(sulcus intermedius)** indicating subdivision into the pyloric antrum and canal, the latter only 2–3 cm in length and terminating at the pyloric constriction***.(Peter et al, 1995).***

The two peritoneal layers meet along the greater curvature to form :

١) Greater omentum attached to transverse colon & mesocolon.
٢) Gastrosplenic ligament contains the short gastric vessels to the spleen.
٣) Gastrophrenic ligament, which is a small peritoneal fold,
that joins stomach with the diaphragm.

(Cuscheirie, 1995)

The Gastric Surfaces :

1- Anterosuperior surfaces :

The left part of this surface is posterior to the left costal margin and in contact with the diaphragm, which separates it from the left pleura, the base of the left lung, the pericardium and the left sixth to ninth ribs and intercostal spaces.

It is related to the costal attachments of the upper fibers of the transversus abdominis, separating it from the seventh to ninth costal cartilages. The upper and left part of this surface becomes posterolateral and is in contact with the splenic gastric surface. The right part of the anterosuperior surface is related to the left and quadrate lobes of the liver and the anterior abdominal wall. When the stomach is empty the transverse colon may be anterior to it. The whole surface is covered by peritoneum and part of the greater sac separates it from the above structures ***(McMinn, 1999).***

2- Postero-Inferior surface :

It is related to the diaphragm, the left suprarenal gland, upper part of the front of the left kidney, the splenic artery, anterior pancreatic surface, left colic flexure and the transverse mesocolon (upper layer).

Together form the shallow stomach bed, over which the stomach slides due to the intervening lesser sac. The splenic gastric surface is usually included in the stomach bed, though separated from the stomach by the greater sac. The greater omentum and the transverse mesocolon separate the stomach from the duodenojejunal flexure and small intestine. A plane through the angular incisure of the lesser curvature and the left limit of the opposite bulge on the greater curvature abruptly divides the stomach into a large body **(left)** and a smaller pyloric part ***(right) (Williams & Dyson, 1992).***

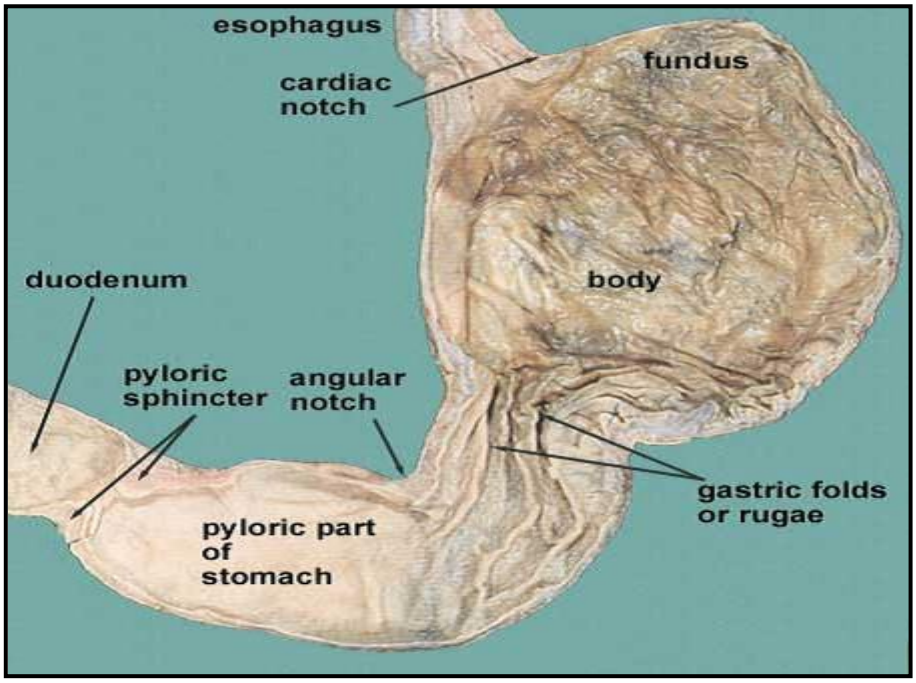


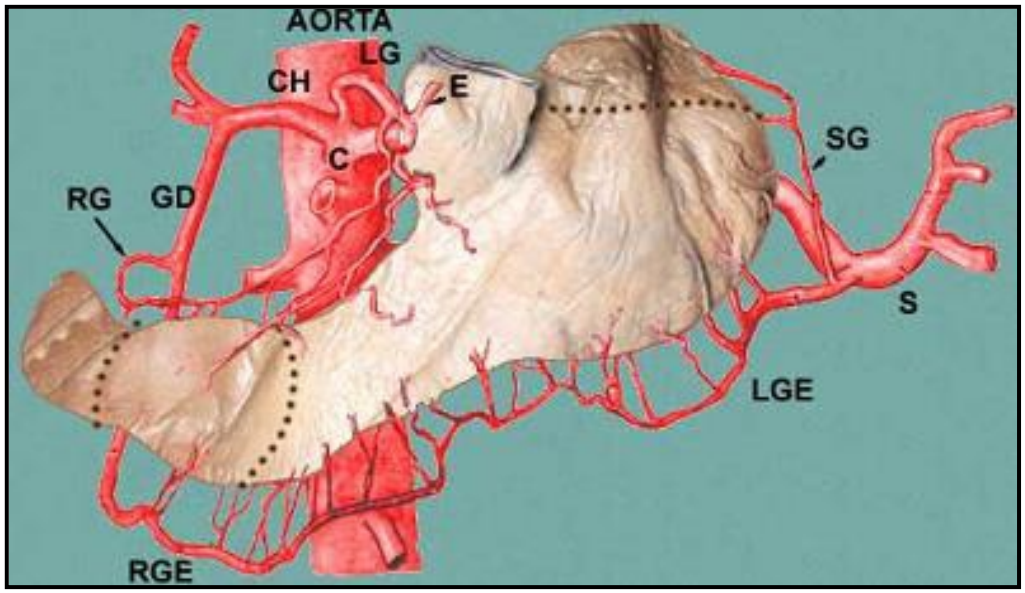
Fig (1): *Inside Structures of the Stomach* ***(Quoted from Norman ,1999)***

Blood supply of the stomach

Arterial supply :

The blood supply of the stomach is considered as very rich blood supply. Six vessels provide the main arterial blood supply. The left gastric artery from coeliac trunk and the right gastric artery from the hepatic artery, supply the area of the lesser curvature.

The right gastroepiploic artery from gastroduodenal and left gastroepiploic artery from splenic artery supply the greater curvature, the splenic artery supplies the area of the fundus by the short gastric arteries, and the gastroduodenal artery sends branches to the area of the pylorus. A rich anastomotic network is evident and end arteries serve no area. ***(McMinn, 1999).***



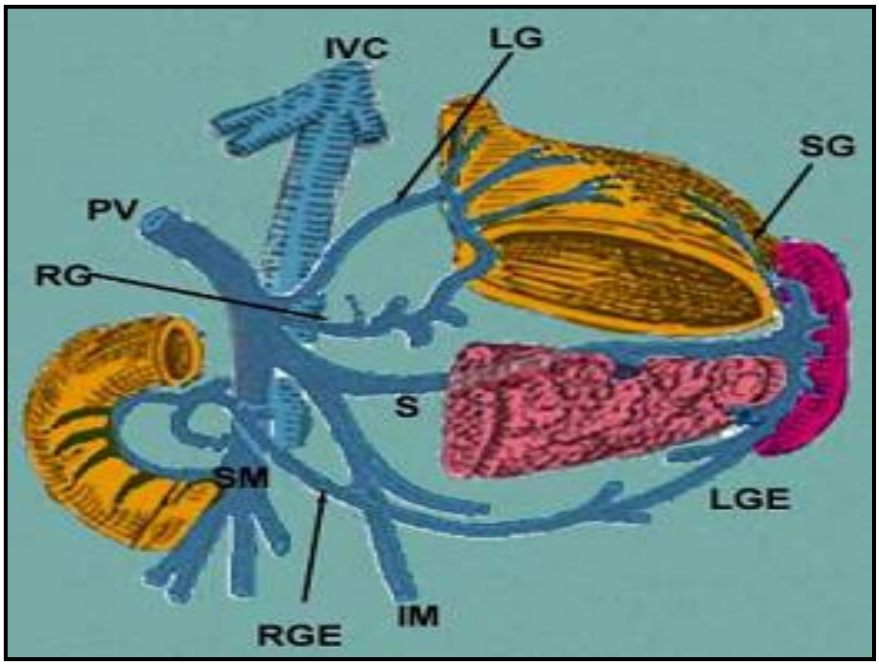
Fig(2): Arteries of the Stomach :

C	celiac artery
E	esophageal artery
S	splenic artery
SG	short gastric artery
CH	common hepatic artery
GD	gastroduodenal artery
RG	right gastric artery
LG	left gastric artery
LGE	left gastroepiploic artery
RGE	right gastroepiploic artery

(Quoted from Norman ,1999)

Venous Drainage :

The veins of the stomach mainly accompany the arteries. The left gastric or coronary vein which receives branches from the oesophageal veins, which correspond to the right and left gastric arteries, terminate in the portal vein. Those corresponding to the left gastro-epiploic artery and posterior gastric artery join the splenic vein while the right gastro-epiploic vein empties into the superior mesenteric vein. The veins of Mayo are helpful landmarks in distinguishing the pyloric canal from the first part of duodenum ***(Wastell, 1995).***



Fig(3): Venous Drainage of the Stomach

IVC: Inferior Vena Cava

SG : short gastric veins

LG : left gastric vein

PV : portal vein

RG : right gastric vein

S : splenic vein

SM : superior mesenteric vein

IM : Inferior mesenteric vein

RGE: right gastroepiploic vein

LGE : left gastroepiploic vein

(Quoted from Norman ,1999)

Nerve supply of the stomach

Vagus nerve :

The vagus nerves are the sole of parasympathetic innervation of the foregut and the midgut . The 2 major vagal trunks pass through the oesophageal hiatus in close approximation to the esophageal muscle. The nerves are originally located to the right and left of the esophagus and stomach during embryonic development.

When the foregut rotates, the lesser curvature turns to the right and the greater curvature to the left. The corresponding shifts in location of the vagal trunks follow.

The vagi from the thorax to the abdomen are passing below each pulmonary hiatus. The left and right vagus nerves descend on either side of the oesophagus, and in the lower thorax, branch and anastomose with each other as the oesophageal plexus, then unite to form two vagal trunks anterior and posterior to the oesophagus.