



TOPOGRAPHIC STUDY OF STOMACH IN CADAVERS

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ABSTRACT The Stomach is affected by many conditions, a thorough knowledge of the stomach regarding its shape, position, blood supply, nerve supply, lymphatic drainage, mucular pattern, relations with other organs and anatomical variations which will aid the surgeon to avoid complications during surgeries. Shape and position of the stomach can vary greatly with or without any physiological disturbances. However some of its rare shapes may result in the formation of volvulus or may increase the risk of gastric ulcer. Variant shapes of the stomach may be of congenital occurrence or are acquired later on in life. So as examined after death the shape of stomach is usually fixed at some stage of digestive process – exhibiting different shapes physiologically. Large globular portion on the left and narrow tubular part on the right and transition between two regions is usually gradual. 50 stomachs were studied for their size and shape during the period of 2017-2019 in Andhra Medical College, Visakhapatnam in department of Anatomy. The shape and sizes of the stomachs were noted. Sthenic or normal type/ J Shape Hypersthenic / Steer Horn, Hyposthenic or Asthenic type, Cascade.

KEYWORDS : stomach; shape; position, postmortem., sthenic, hyper sthenic, Asthenic.

INTRODUCTION

Classic anatomical textbooks describe the stomach as the most dilated part of the digestive tract, located beneath the diaphragm in the left hypochondriac and epigastric region of the abdominal cavity [20, 30, 32]. Its shape and position are strongly associated with organogenesis. Any developmental abnormality of the organ itself or nearby located viscera and peritoneum, as well as their vessels and nerves may influence stomach morphology [3, 20, 26, 29, 30]. The final topography depends also on contents of the stomach and surrounding viscera, respiratory phase, age, body type of the individual and posture. The empty organ is characterized by a cylindrical form with a well-formed anterior and posterior wall, lesser and greater curvature as well as fundus, cardia, body and pylorus (Figs. 1a, a.2). In distended one, the anterior wall increases the area attached to the abdominal wall. During inspiration the organ is displaced downward, while elevated in expiration. Any abnormal fluid accumulation in the pleural and peritoneal cavity may change the stomach shape as well. Heavily build hypersthenic individuals with short thorax and long abdomen are likely to have stomach that is placed in higher position and more transversally. In persons with a slender asthenic physique, the stomach is located lower and more vertical. More vertical position and slightly left organ translocation—secondary to a relatively large liver—are typical of young children, in particular in newborns [30]. Changes with in the ventriculus like musculature of organ, tone of abdominal muscles and amount of stomach contents. The stomach is an infradiaphragmatic abdominal organ that is commonly involved in various pathological processes that originate from the organ itself (i.e. inflammations, peptic ulcers, neoplasms, etc.) and less frequently from other surrounding viscera [18–20]. Nowadays, some of these diseases may be successfully treated pharmacologically; however, many of them — especially neoplasms — require surgical intervention. Surgical procedures usually change the normal morphology of the stomach.

NORMAL SHAPE

So as examined after death the shape of stomach is usually fixed at some stage of digestive process – exhibiting different shapes physiologically. Large globular portion on the left and narrow tubular part on the right and transition between two regions is usually gradual.

MATERIALS AND METHODS

During our routine dissection for Undergraduates and Postgraduates for a period of 3 years, a study was done on a total of about 50 stomachs from properly embalmed cadavers, in the department of anatomy, Andhra Medical College, Visakhapatnam. The ends are noted by palpation and the blood supply and nerve supply along the omenta are noted. then both ends are ligated and stomachs are removed. The intra gastric volume is noted by injecting water through pyloric end and the cardiac ligature is removed and the contents are poured into measuring jar and thus the volume is noted. The shape and sizes of the stomachs were studied. The interior of the stomach is studied by giving incision along the greater curvature and the inner mucosa is studied. The length and diameters and the thickness were noted. Thus finally the variations in the shapes are specifically noted.

OBSERVATIONS

SHAPE: Stomach with “J” shape are about 35—around 70%, fig – 2. 7 of them showed reverse “L” shape, around 14%, fig-3. 5 are crescentic around 10% fig -4. and the remaining showed an hour glass type of stomachs fig 5. table 1

TABLE 1

NO:OF SPECIMENS	SHAPE OF STOMACH	%
35	J	70
7	REVERSE L	14
5	CRESCENTIC	10
3	HOUR GLASS	1.5

**FIG 2, J- SHAPED**



FIG3- REVERSE L SHAPED

SPECIMEN - 1

Typical hour glass constriction

Greater curvature-45.8cm
 Lesser curvature-16cm
 Width-mid point-lesser curvature & greater curvature-6.4cm
 Length fundus-5.5cm
 Width at lower end-9.5cm

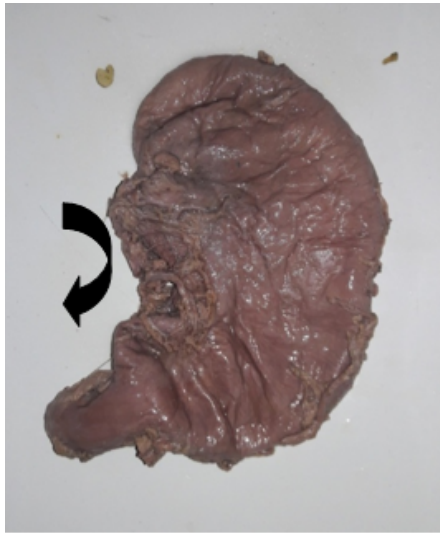


FIG-4 CRESCENTIC SHAPED

SPECIMEN-2

Hour glass constriction associated with atrophy

Greater curvature-35cm
 Lesser curvature-12.5cm
 Width-mid point-lesser curvature & greater curvature-5.5 cm
 Length fundus-7cm
 Width at lower end-6.8cm

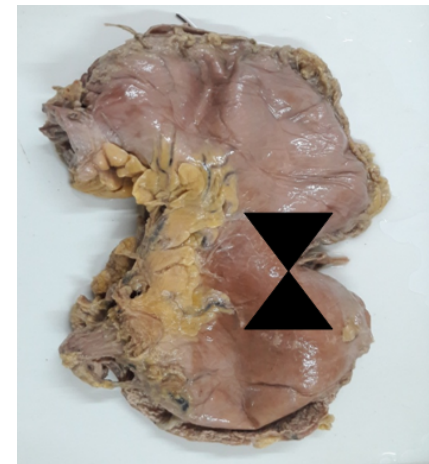


FIG5- HOUR GLASS

SPECIMEN-3

Hour glass constriction

Greater curvature-42cm
 Lesser curvature-12cm
 Width-mid point-lesser curvature & greater curvature-6 cm
 Length fundus-5.8cm
 Width at lower end-9.7cm



Length: In the "J" shaped stomachs the length is more, and the length is less in crescentic stomachs. The length varies between 9 -11 inches in J shaped specimens, 9-10 inches in reverse "L" specimens, 8-9 inches in cylindrical specimens, 7-8 inches in crescentic specimens. The average length in J shaped stomach is 10 inches and the average width is 5 inches. The specimens showed according to description of authors. The specimens extended between cardiac orifice to pyloric orifices. The extent of greater curvature at the level of L3 in 50 specimens, at the level of L2 in 15 specimens, and at the level of L 4 in 5 specimens. Average Length of Greater curvature - 41.93cm . Average Length of Lesser curvature - 13.2cm. Width-mid point-lesser curvature & greater curvature - 9.76cm. Length of fundus - 6.28cm. Width at the lower end - 10cm. FIG: 6,7,8 shows the rare shape of stomach hour glass constriction. It is always pathological

CAPACITY: Out of 50 specimens 66% had average capacity of 1500ml and in 30% it is 1200ml. 3 of hour glass stomachs it ranged from 800ml minimum to 1200ml.

No: of specimens	capacity	%
33	1500ml	66
14	1200ml	30
3	1000ml	6

DISCUSSION

The shape of the stomach is J shaped in concurrence with the standard authors . Ranganathan TS described as pear shaped structure. In the Calanders surgical anatomy the shape of stomach is given as cornucopia. In present study 70% stomachs are J shaped; 14 % are reverse "L" shaped; 10% are crescentic shaped which coincides with the Calanders description. The other different shape we came across is hour glass constriction or leather bottle type. And is in 3 specimens . It was previously thought to be of pathological origin, the view formally held by many and occasionally congenital malformation, is discredited by more recent investigations. A typical hour-glass form with two thin-walled sacs, a larger

cardiac, and a somewhat smaller pyloric connected by a cylindrical, thickwalled, constricted portion. They are more or less completely and permanently divided into two large parts, held by a narrow constriction, so that it resembles an hour glass. The viscus was measured after being incised, emptied, and spread out flat. There were no adhesions nor constricting bands in the vicinity of the viscus, nor is there any external appearance denoting cicatricial contraction from disease of the unoscosa or wall.

The macroscopic appearance of the fibres is noteworthy. Upon the constricted portion anteriorly they are oblique and circular, whilst posteriorly they are longitudinal, reminding one of a constricted band of longitudinal fibres of time large bowel. The lesser curvature is not involved in the constriction. Upon incising the constriction along its upper border, we find no evidence of cicatrization nor of any pathological process. The wall is fully three times the thickness of that of the sacs. The mucous membrane is thrown into longitudinal folds which greatly encroach upon the lumen of the tube. The appearance is similar to that seen in the interior of a contracted urinary bladder or other contracted hollow viscus. Hour-glass stomachs are not infrequently found in post-mortem. This is Specific aetiology-is confirmed by histopathology for the specimen which proved to be - congenital/idiopathic. Fig: 6,&7. The lower extent reached to the level of L3 and in 20% to L2 level and in 8% reached to L4 vertebral levels. The capacity ranged from 1000 ml to 1500 ml.

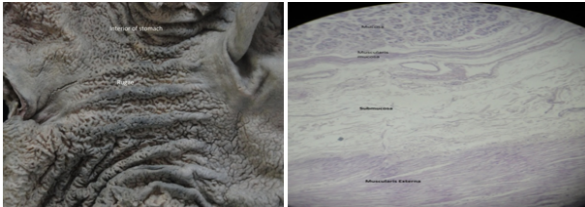


FIG:6- Interior

Fig 7- Microscopic view

CONCLUSION

The majority of specimens are "J" shaped. The length of J shaped stomachs are more when compared with crescentic shaped stomach. The extent of greater curvature at different levels. In 71.4% specimens are at the levels of L3; 21.4% specimens are at the level of L2 and the remaining 7.2% at the L4. Average Length of Greater curvature – 41.93cm. Average Length of Lesser curvature – 13.2cm. Width-mid point-lesser curvature & greater curvature – 9.76cm. Length of fundus – 6.28cm. Width at the lower end – 10cm. Hour Glass stomach is a rare finding which might be pathological or idiopathic or congenital as described by Primrose in Canadian medical journal ulcer where that is possible. The constriction in hour-glass stomach is always of pathological origin. The view formerly held by some that it is occasionally and congenital malformation is discredited by more recent investigation. Chronic gastric ulcers (either isolated or associated with a new growth). Contraction of adhesions outside the stomach following a suppurative infections. (maybe associated with chronic ulcers). Neoplasia – Gastric adeno carcinoma. Linitis plastica. Gastric volvulus – organo axial, - mesenterico axial. Peristalsis. Bariatric surgery. All the above might be the etiology. Accumulation of the gases due to putrefaction may cause distended stomach when the wave is at mid position appears as hour glass. As to a congenital form, it appears to have been generally held in Great Britain, and to a lesser extent on this continent, that there was a congenital form of hour-glass stomach; and even Riegel, in his volume *ill Nothiuagel's Encyclopedia*, accepts this view, although Continental European writers have usually opposed it. In Cunningham's *Text-Book of Anatomy* (1st edition, 1902) Professor Birmingham states that there is a congenital form. But in a recent monograph (2) Professor Cunningham appears to hold the view that a congenital form does not exist. He cites much evidence to show that the different shapes found in so-called congenital hour-glass stomachs are due to fleeting or temporary contractions of larger or smaller bands or portions of the circular and oblique fibres, being merely phases of peristalsis which have become fixed in death.

A note may also be added on diverticula of the stomach. W. F. Hamilton (3), however, describes and figures a stomach presenting a peculiar shape. A chronic ulcer with cicatricial contraction is the most common cause, but a new growth may lead to its production. In some instances the contraction of adhesions outside the stomach may produce the constriction. Adhesions may be associated with ulcer as was the case in two of the instances which are reported in this paper. But in all three

hour glass stomachs the pathological report showed normal histology with no mucosal or submucosal changes or muscle thickness. Absent cicatricial tissue states that it is Idiopathic/ congenital. Authorities seem unanimously agreed that there is a definite acquired form of hour-glass stomach, the causes being cicatricial contraction following ulceration, or corrosive gastritis, traction or compression by adhesions, bands, etc., or occurring with carcinoma.

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