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Morphometry Of The Stomach In Adult Male And Female Human Cadavers

Mr. Vinod S. Chandgadkar[1] , Dr. Shilpa M. Bhimalli[2]*

[1]Postgraduate in M.Sc. Medical Anatomy, Department of Anatomy, Jawaharlal Nehru Medical College, Belagavi 590010
[2]Professor, Department of Anatomy, Jawaharlal Nehru Medical College, Belagavi 590010
*Mr. Vinod S. Chandgadkar. Tel.:+91 8762264535
Dr. Shilpa M.. Bhimalli Tel.:+91 9916241707
E-mail address: vinod3.1428@gmail.com
E-mail address: shilpambhimalli@gmail.com

A B S T R A C T :

Context: The stomachs morphometry can change significantly with or without physiological problems. Studying the stomach morphology in human cadavers offers practical anatomical knowledge which will help the surgeon perform procedures without incident. Knowledge of morphometric variations of stomach is crucial for surgeons and radiologists to reduce intraoperative risks. It also provides anatomists with valuable insights for both research and clinical applications

Aims: Study the morphometrical features of adult male and female cadaveric stomachs such as Length and width.

Settings and Design: Descriptive, observational

Methods and Material: The study includes 80 adult human cadavers, obtained from department of Anatomy of J. N. Medical College, Belagavi. Dissection was done as per the guidelines according to the "Cunninghams manual of anatomy". morphometrical features of stomachs were observed and results were tabulated.

Statistical analysis used: The statistical program IBM-SPSS 27, T-test for 'p' value (p=0.05 was considered statistical significance).

Results: Average length and width are 24.13 and 15.73 cm respectively.

Conclusions: Length and width of stomach is larger in males as compared to females.

Keywords: Morphometry; greater-curvature; lesser-curvature; length.

1. Introduction

The stomach, a hollow muscular organ which lies obliquely situated in left hypochondrium, epigastric and umblical region. 1,2 It measures approximately 25 cm in length, it can expand from a 30 ml capacity at birth to over 2 liters in adults. Structurally, it consists of two orifices (cardiac and pyloric), two curvatures, known as the greater and the lesser, two distinct surfaces, and three anatomical sections. 3 The cardiac orifice is present between oesophagus and stomach, while pyloric orifice leads to duodenum. 4 The greater curvature, on the left, provides attachment to ligaments and omenta, while the lesser curvature connects to the lesser omentum. 5 Diagnostic tools like barium studies and endoscopy rely on knowledge of the stomach's size, shape, and anatomy for accurate assessments.4 Studying cadaveric morphology aids in understanding anatomical variations, benefitting clinical, educational, and surgical practices, ultimately improving medical outcomes and preoperative planning. This research emphasizes the importance of detailed anatomical insights.6

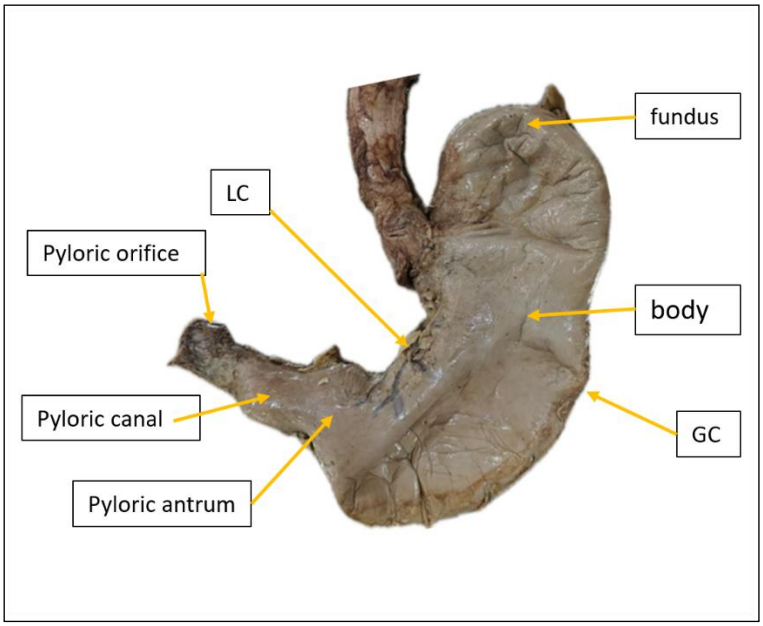
2. Objectives

To assess the stomach's morphometrical measurements such as length and width of the stomach.

3. Materials and methods

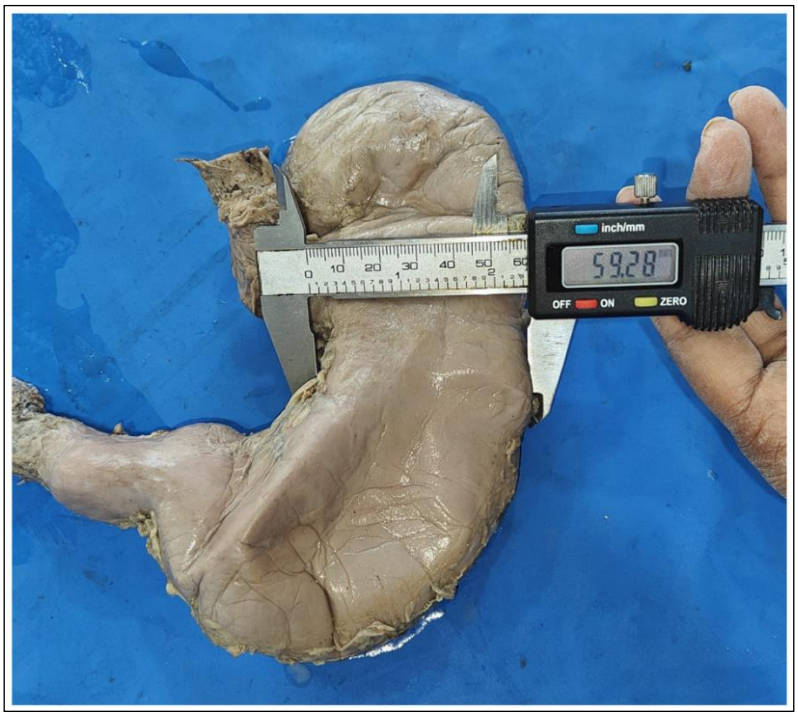
Source of Data: The materials consist of 80 human cadavers of both male and female sexes available in Department of Anatomy, KAHER's Jawaharlal Nehru Medical College, Belagavi, during the study period.
Study Design: Descriptive observational study.
Study Period: 1 Year (January 2023-2024)
Sample Size: 80 adult human cadaveric stomachs were taken.
Inclusion Criteria: Normal stomach.
Exclusion Criteria: Stomach's having any pathological conditions
Dissection of stomach was done as per the guidelines mentioned in the "Cunningham Manual of Dissection". [7]

- Two incisions were made: one extending from the xiphoid process through the umbilicus to the pubic symphysis, and the other running from the pubic symphysis to the anterior superior iliac spine on both sides.
- The abdominal skin flaps were gently lifted, ensuring that superficial fascia was kept intact on the ant. abdominal wall.
- The superficial fascia was segmented in the midline.
- External-oblique muscle, transverse-abdominis muscle, and rectus abdominis muscles were located and were cut along horizontal and vertical axis.
- The structures were observed in the peritoneal cavity.
- The length of the stomach was measured (from the highest point on the fundus to the lowest point on the GC)
- The width was measured (distance between the midpoint of LC and midpoint of GC)



Figure/Graph 1: Different parts of the stomach

Figure/Graph 2: Measurement of length of stomach (from the peak point on the fundus to the most bottom point on the GC)

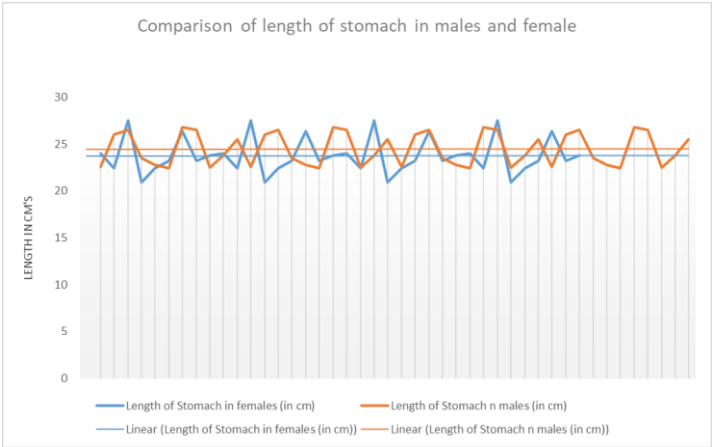


Figure/Graph 3: Measurement of width of stomach (distance between the midpoint of LC and midpoint of GC)

4. Results

A. Comparison of length of stomach in males and females

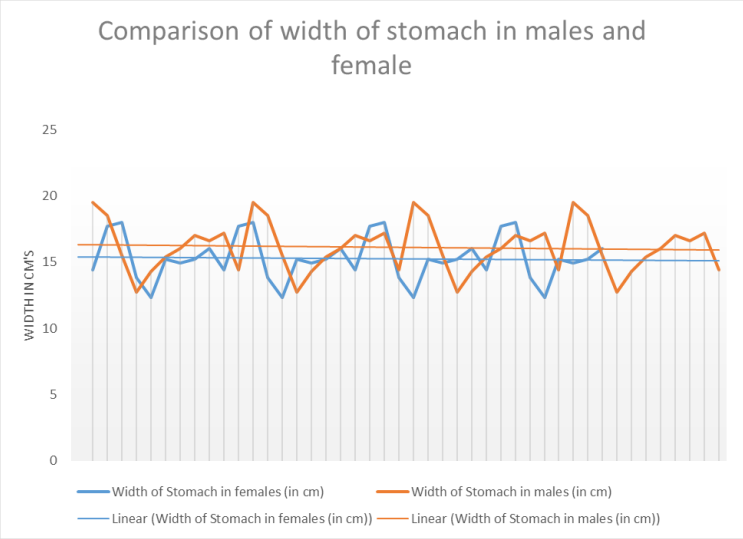
Measurements of the stomach lengths in cm for men and women are included in this collection. The readings for males fall between 22.4 and 26.8 cm, with a range of 14.4 cm and an approximate mean of 24.44 cm. Female measurements, on the other hand, range from 20.9 cm, to 27.5 cm. The mean length of the stomach in females is roughly 23.75 cm, with a wider range of 16.6 cm. Both groups' medians are around the means, indicating that their distributions are comparatively symmetric. These findings emphasize minor anatomical variations between the sexes by showing that male stomach lengths are marginally longer and less variable.



Figure/Graph 4: Comparison of length of stomach in males and female

B. Comparison of width of stomach in males and females

The average stomach widths of males and females in centimetres; the average width for males is about 16.1 cm, with a range of 12.7 cm to 19.5 cm and the mean width for females is about 15.27 cm, with a range of 12.3 cm 18 cm. Although there is variability in both genders, the average stomach width for males is generally wider. This summary sheds light on the comparative distribution and trends across the genders in the dataset.



Figure/Graph 5: Comparison of width of stomach in males and females

5. Discussion

- A study conducted by A. M. Karnul et. Al. on morphological variations of the stomach in adults, they found that the mean length of the stomach in males and females and were found to be 19.2 cm and 17.1 cm respectively. [8] On other hand present study showed length of the stomach in males and females observed were 24.44 cm and 16.1 cm respectively, showing minor differences to that of the study conducted by A. M. Karnul et. Al.
- In a study conducted by K. Yesupadam et. al. on "A cadaveric study for structural variations of the stomach" the authors observed the average length in the stomach ranging between 17.78 – 27.98 cm where as in the current study it was observed to be 24.13 cm which lies in the same range. The authors specifically analysed the mean length and width of the 'J' shaped stomach which is found to be 25.5 cm and 12.7 respectively [9], whereas in our study we observed 25.5 cm in length and 15.91 cm in width. The length showed similar parameters as our study while slight variation was noted in width of the other study.

6. Conclusion

Length and width of stomach is larger in males as compared to females.

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