



**A PROGRESSIVE OBSERVATIONAL STUDY OF CORRELATION BETWEEN DISTANCE OF OESOPHAGOGASTRIC JUNCTION FROM UPPER CENTRAL INCISORS AND HEIGHT OF A PERSON OF INDIAN ORIGIN.**

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**ABSTRACT**

The distance of oesophagogastric junction from upper central incisors is clinically important in various procedures like oesophageal manometry and 24 hours pH monitoring in patients with clinical features suggestive of gastroesophageal reflux disease and achalasia cardia.

The various anatomical studies done to determine distance of oesophagogastric junction from upper central incisors were based on cadaveric dissection. There is significant variability in the distance of oesophagogastric junction from upper central incisors derived from the cadaveric dissections across age, sex and race. Variability is also seen between cadaveric distance of oesophagogastric junction from upper central incisors and the distances measured on upper gastro-intestinal endoscopy. Many studies have tried to estimate length of oesophagus using various external body parameters and most have concluded that the height of the person is the best parameter to estimate distance of oesophagogastric junction from upper central incisors before doing any interventional procedure.

This study was done to find a correlation between height of the person and the distance of oesophagogastric junction from upper central incisors, as derived on upper gastrointestinal endoscopy, in an Indian population.

**KEYWORDS :** distance of oesophagogastric junction from upper central incisors, upper gastrointestinal endoscopy, height.

**INTRODUCTION:**

The anatomical distance of oesophagogastric junction from upper central incisors has considerable variations in different people across age, sex, race, etc. as shown by multiple studies<sup>1,2,3,4</sup>. It is also affected by various disease processes.

Anatomists have observed that, in an adult the distance of oesophagogastric junction from upper central incisors ranges between 32 and 50 cm<sup>1, 2, 3, 4</sup>. On upper gastrointestinal endoscopy the usual distance is about 38 to 40 cm, as measured between upper incisors and to the point where change in the mucosa occurs<sup>5,6</sup>. This variation is encountered more often during insertions of nasogastric tube or devices like pH monitor and manometer or during placements of prosthesis for benign or malignant stenosis.

To estimate the distance of oesophagogastric junction from upper central incisors before any procedure, various studies have considered use of correlation between length of oesophagus and external body parameters like height, weight and length of sternum. Most authors have concluded that height is the best parameter for distance of oesophagogastric junction from upper central incisors estimation before any procedure<sup>7</sup>.

This study was done to find the correlation between the height of the person and the distance of oesophagogastric junction from upper central incisors, in an Indian population.

**MATERIALS AND METHODS:**

This progressive observational study was conducted on 500 people with variable complaints. Out of these 500, 250 were males and 250 were females.

The distribution of age was between 20 to 65 years of age.

The standing heights of each patient was noted, measured on a vertical scale.

Each patient was subjected to upper gastrointestinal tract endoscopy as indicated by their complaints, after due written informed consent and their distance of oesophagogastric junction from upper central incisors were measured using

Olympus flexible upper gastrointestinal endoscope with 1 cm markings and forward view.

**Exclusion Criteria:**

- 1) Patients in which standing height could not be achieved due to disease or deformity.
- 2) Patients in whom distance of oesophagogastric junction from upper central incisors could not be assessed due to various disease processes like oesophageal strictures, benign or malignant tumours of pharynx or oesophagus, etc.
- 3) Patients with history of upper gastrointestinal tract surgery.
- 4) Patients under the age of 18 years.
- 5) Patients who are medically unfit for the procedure.

**RESULTS:**

The mean ages of the male and female groups were 41 years and 39 years respectively.

The mean height of the male group was 168.62 cm.

The mean of observed distance of oesophagogastric junction from upper central incisors amongst the males was 37.78 cm.

The mean height of the female group was 160.67 cm.

The mean of observed distance of oesophagogastric junction from upper central incisors was 35.80 cm.

**Statistical Analysis:**

The mean height of males in the world is 172 cm.

The mean height of the females in the world is 160 cm.

The distance of oesophagogastric junction from upper central incisors as stated by many studies and anatomical texts is 38 to 40 cm.

	Males	Females
Mean height (cm)	168.62	160.67
Distance of oesophagogastric junction from upper central incisors (cm)	37.78	35.80

The ratio of the mean height with the mean distance of

oesophagogastric junction from upper central incisors of the male group (168.62/37.78) is 4.463.

The ratio of the mean height with the mean distance of oesophagogastric junction from upper central incisors of the female group (160.67/35.80) is 4.487.

#### DISCUSSION:

The anatomical properties of oesophagus must be given due consideration to understand and appropriately use the available technological advancements. The available information regarding the length of an oesophagus has been based on cadaveric measurements. Various anatomical studies done till now have described the distance between upper central incisors and oesophagogastric junction between a wide range of 32 cm and 50 cm<sup>1,2,3,4</sup>.

Various clinical procedures like placements of pH meter, manometer, nasogastric tubes, endoprostatic stents, colonic interpositions, etc. would benefit to a large extent with the best possible approximation of distance of oesophagogastric junction from upper central incisors.

There have been various studies to estimate the distance between upper central incisors and oesophagogastric junction with varying conclusions<sup>7,8,9</sup>.

We conducted this study to assess the reliability of height of the person to estimate the distance of oesophagogastric junction from upper central incisors in an Indian population, prior to various procedures.

Data was collected from 500 patients comprising of an Indian population and analysed. Out of these 500, 250 were males and 250 were females. The mean heights of the male and the female groups were 168.62 and 160.67 cm respectively. The mean observed distance of oesophagogastric junction from upper central incisors in males was 37.78 cm and that in females was 35.80 cm.

In this study it was observed that the mean distance of oesophagogastric junction from upper central incisors in the male group (37.78 cm) was close to the distances mentioned in various studies and literature (38 to 40 cm).

However in the female group the distances observed endoscopically were persistently lower than the values as expected.

It was also observed that the distance of oesophagogastric junction from upper central incisors seemed to vary proportionately with the height of the person.

This proportional relationship between the two was observed across both the groups in this study as the ratio of mean height of the person with the distance of oesophagogastric junction from upper central incisors remained constant.

Therefore, we would like to propose this correlation between height of the person and the distance of oesophagogastric junction from upper central incisors- Distance (cm) of oesophagogastric junction from upper central incisors = Height of the person (cm) / 4.4.

Using this correlation, the distance of oesophagogastric junction from the upper central incisors can be estimated using height of the person before any interventional procedure.

#### CONCLUSION:

1) The distance of oesophagogastric junction from upper central incisors in females is generally shorter than the values

observed in many studies.

2) The distance of oesophagogastric junction from upper central incisors varies proportionately with height of the person.

3) Distance (cm) of oesophagogastric junction from upper central incisors = Height of the person (cm) / 4.4.

4) This correlation is reliable even in the female population, however further large scale studies are required to establish this correlation as a standardized formula.

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