The Presence of Barrett's Esophagus Among Cadavers with Concomitant Hiatal Hernias

Kansas City University

Tamara Stojilkovic
Kansas City University

Kelsey Staudinger, DO
HCA/Swedish Medical Center

Ginger Chant
Kansas City University

Naman Jain
Kansas City University

Hana Hamdan
Kansas City University

Anthony Olinger, PhD
Kansas City University

Introduction

- A hiatal hernia occurs when the stomach and/or gastroesophageal (GE) junction or other intraabdominal structures abnormally protrude through the diaphragmatic hiatus.
- These patients are at increased risk of GERD due to a loosening of the lower esophageal sphincter (LES) and lack of normal compression of the LES by the diaphragm.
- Chronic reflux, if left untreated, can over time progress to the development of intestinal metaplasia (Barrett's esophagus), dysplasia, and even esophageal adenocarcinoma.
- This study aims to evaluate the prevalence of underlying Barrett's esophagus in human cadavers with concomitant hiatal hernias to better assess risk factors.

Methods

- 49 formaldehyde-preserved cadavers were obtained by the Kansas City University Anatomy Department.
- BMI was obtained from the donor's medical records prior to embalmment.
- Dissections were performed to expose the esophagus, stomach, and the diaphragm and inspected for the presence of a hiatal hernia (defined as any gastric tissue or any portion of the GE junction above the level of the aortic hiatus of the diaphragm).
- Images and measurements of the hiatal hernia were obtained.
- The hernia sacs were dissected open and evaluated for gross changes and microscopic samples were taken of the tissue at the GE junction, packed in 10% formalin, and sent for histological processing for the evidence of intestinal metaplasia at the GE junction.
- A Pearson's correlation was performed for statistical analyses.

Images

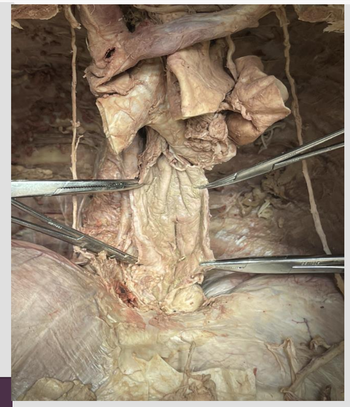


Fig. 1: Gross evaluation of hiatal hernia sac.

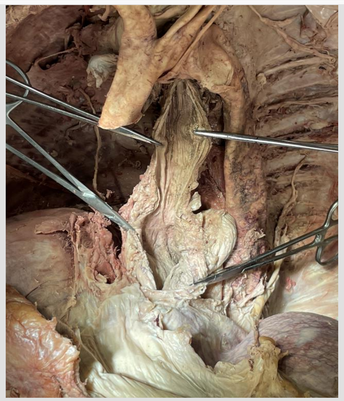


Fig. 2: Gross evaluation of paraesophageal hernia positive for Barrett's.

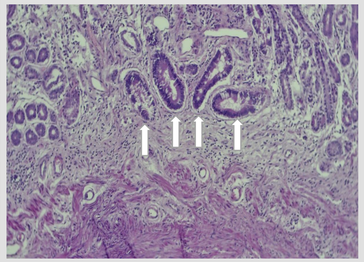


Fig. 3: Intestinal metaplasia at the GE junction.

Results

- 49 human cadavers were evaluated, 16 of which had underlying hiatal hernias.
- Among those with a hiatal hernia, 6 had a BMI >25 and 10 had a BMI <25.
- Only 1 out of the 16 cadavers with a hiatal hernia was noted to have histological evidence of Barrett's esophagus.
- No cadavers had gross evidence of esophageal adenocarcinoma.

Deidentified Patient Number with Hernia	Age	Sex	BMI	Type of Hernia	Height (cm)	Width (cm)	Pathology Findings
1	67	Male	33.5	Hiatal	2.82	4.5	No Barrett's
2	70	Male	22.5	Hiatal	2.04	2.74	No Barrett's
3	66	Female	21.9	Hiatal	1.66	2.62	No Barrett's
4	57	Male	31.6	Hiatal	4.33	10.76	Autolysis
5	72	Female	18.9	Paraesophageal	3.05	2.87	No Barrett's
6	77	Female	18.3	Paraesophageal	2.45	3.33	No Barrett's
7	93	Male	23.9	Hiatal	2.63	3.86	No Barrett's
8	74	Male	23.1	Hiatal	1.14	1.88	No Barrett's
9	69	Male	25.8	Hiatal	2.89	4.27	Autolysis
10	85	Female	17	Hiatal	3.67	4.19	Barrett's esophagus
11	52	Male	26.1	Hiatal	1.72	2.89	No Barrett's
12	80	Female	23.8	Hiatal	2.14	2.26	No Barrett's
13	74	Female	23.6	Hiatal	2.02	3.84	No Barrett's
14	88	Male	26.4	Hiatal	6.32	5.56	No Barrett's
15	80	Female	25	Hiatal	2.65	2.98	No Barrett's
16	74	Female	19.3	Hiatal	3.15	2.69	No Barrett's

Discussion

- The presence of a hiatal hernia is highly associated with the development of GERD which is a risk factor for Barrett's esophagus.
- In this study, 32.65% of randomly sampled cadavers had a hiatal hernia present, and of those, 6.25% had evidence of Barrett's esophagus.
- Increasing BMI, a known risk factor for the development of a hiatal hernia, was surprisingly not statistically associated with the presence of a hiatal hernia in this study compared to normal level BMI cadavers.

Conclusion

- Hiatal hernias can predispose individuals to the development of Barrett's esophagus with time, if left untreated.
- As Barrett's esophagus is a well-known risk factor for the development of esophageal adenocarcinoma, patients with hiatal hernias should seek consultation for consideration of operative repair.

Sources

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