pH Evaluation of Hiatal Hernia Measurement

Glenn M. Ihde MD, Stephen T. Brewer PhD, Hailey A. Allen
Matagorda Regional Medical Center, Angelo State University, University of Texas at Austin

MATAGORDA REGIONAL MEDICAL CENTER

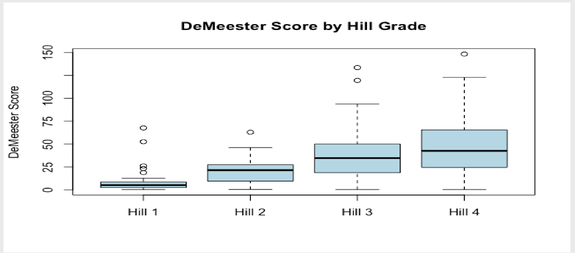
BACKGROUND

Failure of the anti-reflux barrier can occur with progressive dilation and displacement of the esophageal hiatus. Methods of measurement include Hill grade, axial displacement and greatest transverse diameter. We use pH measurements to identify significant differences in hiatal measurement.

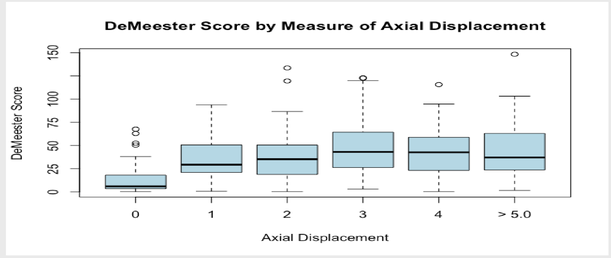
METHODS

A registry of endoscopic measurements was analyzed for differences in pH. A total of 288 patients with measurements of Hill grade, axial displacement of gastroesophageal junction and greatest transverse diameter and pH Demeester scores were reviewed. Anova was then used to evaluate statistical differences between each measurement.

RESULTS

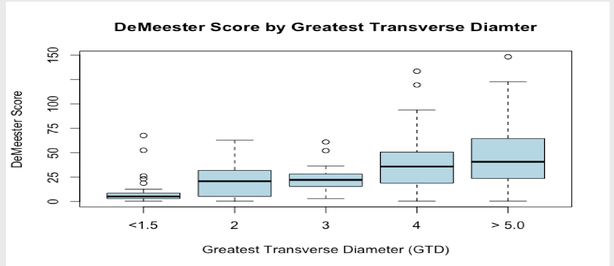


Hill grade 1, N=40, had a mean DeMeester score of 8.95(0.3 to 67.6) sd 13.31. Hill grade 2, N=17; 21.70(0.4 to 62.9) sd 16.64. Hill grade 3, N=129; 37.03(0.3 to 133.5) sd 25.14. Hill grade 4, N = 102; 47.87(0.3 to 148.3) sd 30.88. Anova analysis demonstrated differences between Hill 1 and Hill 3 and Hill 4, Hill 2 and 4 measurements.



Axial displacement measurement of 0.0 displacement, N=59, had a mean DeMeester score of 12.98(0.3 to 67.6) sd 12.98. 1.0 centimeter (cm) displacement, N =39; 36.26(0.7 o 93.8) sd 25.06. 2.0 cm displacement, N=79; 38.1(0.3 to 133.5) sd 27.05. 3.0 cm axial displacement, N=46; 46.93(3.0 to 122.8) sd 46.93. 4.0 cm axial displacement, N=27; 46.57(0.3 to 115.6) sd 29.43. An axial displacement > 5.0 cm, N=38; 46.40(1.6 to 148.3) sd 31.84. Anova analysis demonstrated differences between 0.0 cm measurements and all other measurements.

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Greatest transverse diameter measurements of < 1.5 cm, N=40, had a mean DeMeester score of 9.03(0.3 to 67.6) sd 13.26. 2.0 cm, N=7; 22.62 (0.3 to 62.9) sd 22.45. 3.0 cm, N=15; 24.67(2.9 to 61) sd 24.67. 4.0 cm, N=124; 37.64(0.3 to 133.5) sd 25.48, > 5.0 cm, N=102; 47.34(0.3 to 148.3) sd 30.93. Anova analysis demonstrated differences between measurements of 1.0 and 3.0, 4.0, 5.0 and 3.0 to 1.0 and 5.0, and 4.0 to 1.0, and 5.0 to 1.0 and 3.0 cm.

DISCUSSION

The gastroesophageal anti-reflux barrier is composed of three components: the lower esophageal sphincter, the competent esophageal hiatus, and the angle of his. It stands to reason that failure of individual components would lead to a measurable , incremental increase in acid exposure. This study was carried out to test that hypothesis and identify when a progressively deteriorating esophageal hiatus would worsen reflux as measured by increasing acid exposure of the distal esophagus. This study also compares the three most common methods of measuring the esophageal hiatus to determine if there are differences in the sensitivity of each measurement that can be used for determining if the hiatus requires repair. .

CONCLUSIONS

Hill measurements may guide the decision for hiatal repair when Hill grade is $\geq$ 3, axial displacement for any displacement of the gastroesophageal junction, and greatest transverse diameter if the measurement is $\geq$ 3.0 cm. Further study of these measurement systems is needed to determine which measurement best guides the decision for hiatal repair.

REFERENCES

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