Endoscopic & Manometric Position-Related Characteristics of the Normal Gastroesophageal Junction

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Introduction

- Relationship between body position and gastroesophageal junction (GEJ)
- Gastroesophageal reflux disease (GERD): -upright reflux (early) → supine, bipositional reflux (late)
- Endoscopic observation in GERD patients GE valve often becomes less well-defined in upright position weaker?
- Baseline function and anatomy of normal GEJ in relationship to body position not well studied in asymptomatic people

The Gastroesophageal Valve – Hill Classification

Grade I -Well-defined -Good length -No gaping

Fig. 1 Grade I gastroesophageal valve consisting of a musculomucosal fold that adheres to the retroflexed endoscope through all phases of resniration. It extends 3-4cm along the lesser curve, opens only for swallowing, and closes promptly.



GRADE II Fig. 2 Grade II GE valve, slightly less well-defined than Grade I, opens occasionally but closes promptly and is competent against reflux.



Grade III -Effaced -No length -Gaping



Fig. 3 Grade III GE valve, which shows a poorly defined musculomucosal fold. It opens frequently, stays open for long periods, and is often accompanied by a hiatal hernia.

Fig. 4 Grade IV GE valve shows no well-defined musculomucosal fold. It stays open, rarely closes, and is invariably accompanied by a hiatal hernia.



Grade IV -Hernia -Patulous

To summarize, the goals of surgery are: 1) restoration cation for surgery remain strict. The important indica-



Study endoscopic & manometric changes of GEJ in left lateral decubitus (LLD) and upright position in healthy, asymptomatic individuals

Methods

- 10 healthy subjects
 - no history GERD or intestinal disease, screened with GERD-specific questionnaires
- High resolution manometry
 - LLD and upright positions
- Endoscopy
 - detailed antegrade, retroflex views of GEV
 - LLD and upright position
- 48hr Bravo wireless pH capsule
 - Distal esophagus 5 cm above top of rugal folds

Results

- n=10, all asymptomatic
- Mean age 27.2 yrs

Overall results - endoscopy



DR. AYE EGD W/BRAVO



Overall results - manometry

	LLD	Upright	Р
LES length (cm)	3.1	3.2	0.73
Intra-abd LES length (cm)	2.1	2.1	0.87
LESP (mmHg)	17.3	16.1	0.8

Results – 48 hr pH

-6 subjects: Normal pH/Demeester score <15 (mean 8.5)
-4 subjects: Abnormal pH/DeMeester score >15 (mean 26.7)

- mean % upright reflux episodes:

- normal pH: 96%

- abnormal pH: 86% NS

Endoscopy – normal vs abnormal pH groups

Mean Hill Grade

- LLD: Norm pH = 1.5 Abnorm pH = 1.8 p=0.5
- Upright: Norm pH = 2.2 Abnorm pH = 2.5 p=0.6

Transient GEV opening in LLD >10 sec

- Normal pH grp: 1/6 (16.7%)
- Abnormal pH grp: 3/4 (75%) p=0.1



Results – manometry Normal pH grp (n=6)



* **NS**

Results – manometry Abnormal pH grp (n=4)



* **NS**

Discussion

Overall effect of position change from LLD to upright:
weakening of GEV – increase in Hill Grade

•Abnormal pH grp ("silent refluxers") – <u>trend</u> toward:

- higher Hill Grade
- prolonged gaping of GEV on passive observation
- shorter, weaker LES
- inability to maintain LES length, pressure in upright position

•Earliest manifestations of GERD may be elicited through observation of position-related changes

Clinical significance

•Upright reflux represents anatomic and physiologic change of GEJ anti-reflux barrier

Explains why reflux is more frequent in upright position

 Earliest changes in GEJ integrity may be subtle – only detectable with position-related testing

Limitations

- •Small sample size larger numbers needed
- •Non-significant trends...underpowered?
- •Study of "normal" GEV?
- •Natural history...? need comparison studies symptomatic GERD patients

Conclusions

- In normal adults, the GE valve shortens and flattens in upright position (higher Hill grade) compared to LLD
- Trend toward shortening and weakening of the LES in upright position in asymptomatic refluxers
- Anatomic, physiologic basis for the higher frequency of reflux events in upright compared to supine position
- Further studies needed



Results – manometry Abnormal pH grp (n=4)

	LLD	Upright	Р
LES length (cm)	3.2	2.8	0.55
Intra-abd LES length (cm)	1.9	1.6	0.43
LESP (mmHg)	11.2	8	0.03

Results – manometry Normal pH grp (n=6)

	LLD	Upright	Р
LES length (cm)	3.1	3.4	0.54
Intra-abd LES length (cm	2.3	2.4	0.7
LESP (mmHg)	21.4	21.4	0.99

Results – manometry Abnormal pH grp (n=4)

