The Cascade Stomach
Revisited in the 21st Century – What has changed?

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INTRODUCTION

DEFINITION AND DIAGNOSIS

A cascade (cup and spill) stomach is identified as the variant of the shape and topography of the stomach[1] identified on barium studies.

The criteria for the diagnosis of a complete cascade stomach has been suggested as the presence of:

•Angulation of a demarcation line posteriorly between the fundus and body of the stomach

•Barium-air levels present in both the fundus and body respectively[2]

In the 1970s when the entity was first described it was felt that it was predominantly associated with abnormal associated pathology related to the Colon, Spleen, Adrenals, Pancreatic body or even postoperative adhesions[3]. However it is being increasingly realised that it may be seen more commonly without being associated with any of the above. Cascade stomach configurations is even thought to be congenital condition[4].

SYMPTOMS

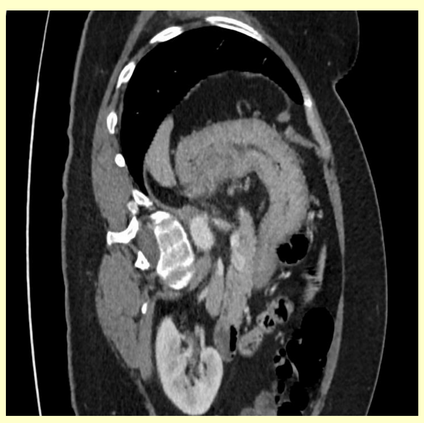
A cascade stomach is thought to be associated with symptoms of dyspepsia; with the shape of the stomach a risk factor[5] and association of cascade stomach with oesophageal reflux has been identified in previous studies[6, 7]. There has been sparse research into the relationship of the presence of cascade stomach and upper GI symptoms for a number of years. Literature suggests there is a degree of differential diagnosis between the presence of hiatal hernias vs. gastric ileus and cascade stomach formations[8].

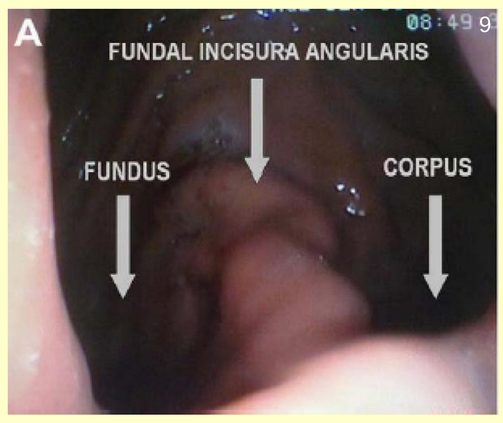
DIAGNOSIS

Barium swallow (Fluoroscopy) has always been the mainstay of diagnosis of the cascade stomach.

Recent suggestions towards an endoscopic diagnosis and grading have been published from Japan[7].

CT scanning has rarely been relied on for the diagnosis and findings are largely incidental.





AIM

To conduct a retrospective review of all patients who were diagnosed to have a cascade stomach based on radiologic criteria and correlate the endoscopic findings and clinical features of presentation.

METHODOLOGY

The setting was a University Hospital where an established cohort of gastroenterologists and upper GI surgeons contributed to the workload of the barium studies that were performed on a protocol based fashion based on clinical symptoms and associated findings on other investigations.

RESULTS

18 patients were identified with a “Cup and Spill”/ “Cascade” Stomach were identified between September 2015 – December 2016.

PRESENTING SYMPTOMS

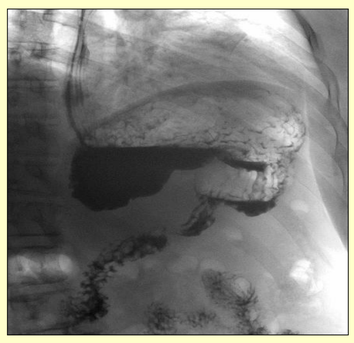
All of the patients were referred with symptoms of Gastro oesophageal reflux disease or dyspepsia in isolation or combination. 12 of the patients had an endoscopy either before or after the swallow to corroborate findings seen on either investigation.

None of them were referred or had associated pathologies with the colon, pancreas, adrenal etc, which was a relatively common indication/finding in the 1970s.

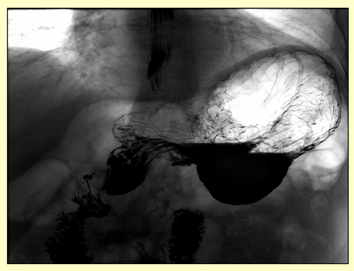
ENDOSCOPIC/RADIOLOGY CORRELATIONS

Of the 12 studies 4 patients were referred for a Barium Swallow having been diagnosed with a potential, significantly sized hiatus hernia, during OGD. Interestingly none of the 4 patients had a hiatal hernia and were found to have a **Classic Cascade** “Cup and Spill” configuration masquerading as a hiatal hernia on endoscopy.

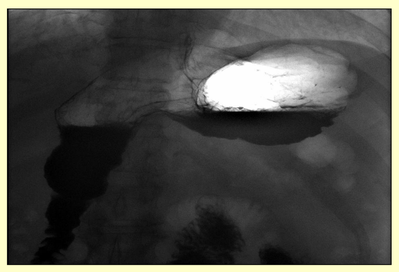
On the same note some of the variant cascade configurations on barium swallow were a part of large hiatal hernias (**Reverse Cascade**) identified by the same study or a part of a gastroptosis (**Antral cascade**).



Classic cascade (Dorsal fundus pouch)



Reverse Cascade –(Ventral fundic pouch)



Antral cascade (Gastroptosis)

DISCUSSION & CONCLUSION

•The cascade stomach seen in the 21st century has a different pathophysiological profile than that was seen in 50 years ago. This is likely due to the advancement in imaging modalities to exclude alternate pathology.

•“Cup and Spill” configuration is consistently associated in patients with Upper GI symptoms of reflux, dyspepsia or mechanical symptoms if associated with a large type III hiatal hernia.

•A cascade stomach configuration can masquerade as a large hiatal hernia on upper GI endoscopy with a falsely positive diagnosis of a hiatal hernia.

•Varying configurations of the cascade configuration (Classic, Reverse, Antral) may warrant a revised radiological classification of this uncommon but interesting anatomical variant of the stomach configuration.

•Endoscopic diagnosis of large hiatus hernia should be correlated with fluoroscopy to exclude an anatomical variant.

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