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Title: Failure of Nissen fundoplication in chronic cough: Evidence for gaseous reflux

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**Body:** Introduction: Accurate diagnosis and management of airway reflux induced chronic cough is challenging. Nissen Fundoplication (NF) is a recognised treatment option for patients who fail medical treatment. Unfortunately some patients continue to be symptomatic even after NF. Aim: To assess pharyngeal gaseous pH in patients who failed to respond to NF Methods: Retrospective case review of 22 patients who remained symptomatic post NF at Castle Hill Hospital, UK. All subjects had pre-NF oesophageal manometery, 24 hours ambulatory PH monitoring and a post -NF airway pH measurement using Restech Dx-pH measurement system. Some of these patients had follow up 24 hour ambulatory PH monitoring. Results: Total of 22 patients (18 female) with a mean age of 45(range22-72) constituted the study population. All of these patients continued to have troublesome cough evidenced by a high Hull Cough Hypersensitivity Score with a mean score of 39(range 25-66), normal < 12. 15(68%) of these patients had an abnormal airway pH study with a mean upright Ryan score of 145(range17.72-573.46), normal < 9.41. All of the 7 patients who had 24 hour oesophageal pH monitoring had a normal DeMeester score with a mean of 3.47(range0.5-11.7), normal < 14.72. Out of the 7 with normal DeMeester 5 had an abnormal airway PH with a mean Ryan score of 175.28(range17.5-573.46). Conclusion: The data suggest that NF eliminated significant acid liquid reflux. A significant proportion of patients continued to have airway gaseous reflux as evidenced by a positive Ryan score. This implies that the aetiology of chronic cough lies in impaction of gaseous reflux in the pharynx and upper airways rather than the liquid reflux detected on conventional testing.