Inter-Observer Agreement between Multi-Channel Intraluminal Impedance-pH (MII-pH) Software Analysis and an Experienced MII-pH Test Reviewer

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Purpose: Over the past decade, new technologies have emerged to evaluate gastroesophageal reflux disease (GERD). One such technique is the 24-hour MII-pH study. This test was designed to detect both acid and non-acid reflux (NAR). A significant drawback of this technique is that reviewing impedance recordings that were collected over a 24-hour period can be cumbersome and time consuming. In an attempt to make this task easier, one of the manufacturers of this device has created a software tool to identify impedance detected reflux episodes based on a number of published parameters. To the best of our knowledge, the utility of an experienced reviewer hand-editing MII-pH tracings after the software analysis has never been evaluated.

Methods: We randomly selected 20 MII-pH studies performed at our institution on patients that were taking a proton-pump inhibitor twice daily. We ran the proprietary software analysis tool (Sleuth™, Sandhill Scientific, Inc., Highlands Ranch, CO) on all of these studies using the same pre-programmed parameters. An experienced reviewer of MII-pH studies (DDF) reviewed all the tracings. The reviewer had the ability to add or delete reflux episodes that had been detected by the software tool. We separately recorded the computer and reviewer’s analysis in regards to the total number NAR episodes. We determined whether the study was considered positive or negative based on published criteria of NAR. We used Cohen’s kappa coefficient to evaluate the inter-observer agreement between the software analysis and the reviewer’s over-read.

Results: The MII-pH software reported significant NAR in 10 of 20 patients. The reviewer diagnosed significant NAR in 9 of 20 patients. The kappa coefficient for NAR between the software analysis and the reviewer’s overall was 0.9. The one study for which there was a discrepancy between the software and the reviewer had a difference of 11 impedance detected reflux episodes with the software marking more reflux episodes than the reviewer.

Conclusion: We demonstrate excellent inter-observer agreement between the software analysis of impedance detected NAR and a hand-edit of that analysis by an experienced reviewer. This finding may lend support to the notion that using software analysis alone is likely adequate to identify clinically significant NAR when using the 24-hour MII-pH system.

Rebamipide Improves Salivary Gland Function and Saliva Transit to the Distal Esophagus


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Purpose: The major abnormalities associated with the development of GERD are related to incompetence of the antireflux barrier and impairment of esophageal luminal clearance after reflux. Although saliva plays an important role in esophageal acid clearance, facilitation of acid clearance has only been addressed via work on various medications which have been shown to have prokinetic effects on the esophagus. This study therefore aimed to investigate the efficacy of a gastro-protective agent, rebamipide, on the function of salivary glands.

Methods: Ten healthy volunteers underwent salivary gland scintigraphy twice with one-week interval. The subject is asked to take a rebamipide tablet at a dose of 100 mg 90 minutes before the beginning of the second scintigraphy. Following intravenous injection of 99mTc-pertechnetate, anterior sequential imaging was performed every minute for 40 minutes. At 20 minutes after injection of radionuclide, a lemon candy was administered intraorally to stimulate salivary secretion. Regions of Interests (ROI) were selected on the individual submandibular and parotid glands, oral cavity, and the pharynx and the upper esophagus. Time activity curves were drawn for each of these. Washout ratio was examined as a functional parameter. For the evaluation of saliva transit, time activity curves obtained from the ROI of pharynx and upper esophagus were analyzed.

Results: The mean washout ratio was 57.8% in the parotid gland and 43.8% in the submandibular gland. If the washout ratios of less than 50% and 36% are defined as functional disorders of parotid and submandibular glands, respectively. After administration of rebamipide, the increased washout ratio (more than 10 points) was found in 5/10 subjects (50%) in submandibular glands and in 1/10 (10%) in parotid glands. Saliva transit from the oral cavity to the esophagus was also improved after administration of rebamipide in 60% of subjects.

Conclusion: We concluded that rebamipide might be one of therapeutic options for low salivary excretion, especially for submandibular glands.

Proximal Black Esophagus: A Case Report

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Purpose: Necrotic esophagus (also known as “black esophagus”) is a rare clinical entity with fewer than 100 cases reported in the literature. Endoscopically, the esophageal mucosa is dark or black with a macerated appearance. Pathologic review shows mucosal and submucosal necrosis. The majority of published cases of black esophagus describe the lesion in only the distal esophagus or encompassing the entire length of the esophagus. To the best or our knowledge, there have been no reported cases of black esophagus confined to the proximal esophagus.

Our patient is a 79 yo male who presented initially to another hospital with chest pain associated with lightheadedness, diaphoresis and dyspnea. He was found to be bradycardic and received a dose of atropine. An ECG showed changes consistent with an inferior myocardial infarction. The patient was given aspirin, heparin, a beta-blocker and two doses of reteplase and was transferred to our facility. Four hours after the onset of chest pain the patient had a coronary catheterization at our institution. That study revealed an 80% obstructing circumflex lesion and a 100% proximal right coronary occlusion. PTCa was performed and a drug-eluting stent was deployed into the distal circumflex artery. Clopidogrel was initiated. Several hours later, the patient experienced a single episode of hematemesis. An urgent EGD was performed and showed black macerated esophageal mucosa with adherent clot in the proximal esophagus. The abnormal tissue was circumferential and was 5 cm in length. The patient was started on twice daily PPI therapy and his other medications were continued. He was later discharged without further complication.

The rarity of black esophagus is likely due to the extensive arterial blood supply to the esophagus. It has been hypothesized that low-flow states may lead to transient esophageal ischemia with free radical formation and subsequent tissue injury upon reperfusion. In this patient, the isolation of black esophagus to the proximal esophagus may have been due to thromboembolism or hypotension associated with his acute coronary event.

5-ALA Photodynamic Therapy Eliminates Resistant Barrett’s Cells

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Abstracts $135