Esophageal manometry: Is it useful in practice?

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RW McCallum. Esophageal manometry: Is it useful in practice? Can J Gastroenterol 1992;6(4):209-211. Overall, there are still important indications for esophageal motility testing in clinical practice, particularly the indication of dysphagia. However, this is not an area that seems to be really increasing in volume, despite the fact that the chest pain era was extremely visible and advanced understanding of esophageal pathophysiology. There are limited esophageal responses to insults and diseases; namely, dysphagia, chest pain, heartburn and odynophagia. Although methodologies have improved along with diagnostic accuracy, it seems that the intensity of interest in manometrics in practice has really not paralleled the proportion of space and time devoted to it by most medical journals and scientific gatherings. One conclusion could be that maybe organ length is important after all, and that as a 20 cm organ the esophagus does have a limited repertoire both to challenge and confuse clinicians.

Key Words: *Chest pain, Dysphagia, Esophageal manometry, Indications, Preoperative assessment, Reflux esophagitis*

De l'utilité de la manométrie œsophagienne dans la pratique

RÉSUMÉ: En général, il y a encore d'importantes indications pour l'épreuve de motilité œsophagienne dans la pratique clinique, particulièrement dans les cas de dysphagie. Cela ne semble cependant pas être un domaine d'activité en hausse, en dépit du fait que son application dans le contexte de douleurs thoraciques ait été largement diffusée et promue et que de grands progrès aient été accomplis dans la compréhension de la physiopathologie œsophagienne. Les réponses de l'œsophage aux agressions et aux maladies sont toutefois limitées; que l'on nomme la dysphagie, la douleur thoracique et la brûlure d'estomac et l'odynophagie. Bien que les techniques se soient améliorées, et que les épreuves diaçnostiques aient gagné en précision, il semble que l'intérêt envers la manométrie dans la pratique ne se soit pas développé proportionnellement avec l'espace et le temps que la plupart des revues médicales et des congrès scientifiques ont consacré lui. On pourrait en tirer la conclusion que la taille de l'organe a son importance après tout et qu'à titre d'organe de 20 cm, l'œsophage ne représente pas pour le clinicien un sujet de perplexité important.

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THIS ARTICLE REVIEWS THE VOLUME and indications for esophageal motility at the University of Virginia Health Sciences Center, from March to August 1989 and for the same six-month period in 1991 (Table 1).

DYSPHAGIA

Dysphagia is probably the most rewarding indication for the use of motility in clinical practice in the author's opinion. The initial test in workup of dysphagia is always the cine-esophagram which evaluates the swallowing mechanism as well as the smooth muscle function of the esophagus and its sphincters. This is best accomplished by the addition of a solid bolus (eg, a 12 mm barium tablet or some kind of barium-impregnated solid food bolus). Esophageal motility can then be useful in the setting of a non-mechanical cause of dysphagia, with or without an abnormal barium evaluation. A motility study will be definitive in confirming an obvious diagnosis such as achalasia in which the x-ray is always abnormal or will at least be a useful adjunct when the x-ray may or may not be abnormal, eg, in diffuse esophageal spasm. It is important to use the solid bolus combined with the barium cine-esophagram to identify a segment of hold-up (often in the mid-esophagus) which can then be specifically approached by positioning manometric ports in that area (1). The entity

TABLE 1
Indications for esophageal motility at the University of Virginia

	March to August 1989 (n=65)	March to August 1991 (n=79*)
Chest pain	43	41
Heartburn/reflux	42	40
Dysphagia	32	38
Symptoms refractory to medication	43	37
Aspiration pneumonia, coughing, hoarseness, night choking	7	13
Cricopharyngeal	13	8
S/P dilation	5	6
S/P esophageal or gastric surgery	5	7
Chronic hiccups	1	2
Provocative test	49	46
(†Anorectal motility – for comparison)	30	41

*S/P Status post. *17% higher compared with 1989;† 33% higher than 1989*

of hypertensive lower esophageal sphincter can present with a normal barium study, but with transient holdup of the solid bolus. This diagnosis can only be appreciated by lower esophageal sphincter assessment including careful appreciation of relaxation measurements during wet swallows (2).

CHEST PAIN

Chest pain is still an important and continuing indication for esophageal motility testing but it is really not an increasing indication, although noncardiac chest pain or angina-like chest pain attributed to the esophagus has been widely publicized. The overall increase in esophageal motility studies over the past two years has been only 16% while the angina-like chest pain indication has not increased. In contrast, interest in esophageal motility testing (at least in academic/clinical practice) has not kept up with the 33% increase in anorectal motility over the past two years.

Nevertheless, in the evaluation of chest pain which has a squeezing or pressure component – with or without associated typical heartburn – esophageal motility is crucial to inform the referring physician if there is a possible esophageal motility disorder to explain the pain (3). As indicated in Table 1, provocative testing remains frequently used, with the Bernstein testing being done about three times more than the combined Tensilon/Bernstein testing.

The role of motility in therapeutically addressing pharmacological effects of agents is very limited, if at all necessary, in practice. Motility is indicated when the lower esophageal sphincter is dilated pneumatically (at least documentation of an effective decrease in lower esophageal sphincter pressure can be reassuring) (4). However, in the long term follow-up of achalasia patients, a more physiological test – such as a radioisotope esophageal emptying study – is much more informative than relying on lower esophageal sphincter pressure.

HEARTBURN/REFLUX

The heartburn and reflux (5), typically linked to 'symptoms refractory to medications', continue to be very frequent indicators. The patient with gastroesophageal reflux generally is referred for evaluation when standard medications have not been effective, before pursuing more aggressive medical therapies or other options (eg, surgery) and when there is a need to identify whether there may be some easily identified motility problem which would explain this apparent refractoriness. In discussing the assessment of gastroesophageal reflux disease, the concept of transient lower esophageal sphincter relaxations and how they can be identified on the motility tracing is crucial. New work that is being done in the diaphragm suggests a technique for assessing the gastroesophageal function (5) which incorporates the joint role of the diaphragm as an external sphincter and the smooth muscle lower esophageal sphincter as the internal sphincter. An absolutely decreased sphincter pressure of less than 5 or 6 mmHg is observed in patients with scleroderma and in those presenting with propensities for aspiration pneumonia, hoarseness and night coughing. Rumination and regurgitation represent a severe subset of patients (probably less than 10%) who are probably born with an intrinsically weak lower esophageal sphincter. Data would not support that reflux alone reduces sphincter pressure and we know that treating endoscopic esophagitis does not bring sphincter pressure back to normal.

Esophageal body motility can be assessed as far as primary peristalsis is concerned, and there is new work suggesting that secondary peristalsis should also be investigated. Overall, the role of impaired motility in the esophageal body has been overestimated and overrated. Most patients with gastroesophageal reflux disease have degrees of dysphagia or holdup of food due to edema and inflammation in the esophagus, particularly the distal esophagus. Only a small subset (less than 20%) have any real decrease in contraction amplitude; a still smaller group (less than 5%) has impairment of peristalsis, which likely is related to previous esophageal strictures and/or Barrett's esophagus. An underlying primary disorder such as scleroderma, amyloidosis or intestinal pseudo-obstruction should first be excluded.

Pre-fundoplication assessment: It is absolutely crucial that esophageal motility studies be done before any surgery is contemplated on the esophagus (5). Evaluation of contraction amplitudes in the distal esophagus, and of peristaltic frequency is key in determining the calibration that may be used in various employed techniques; in particular, the Nissen fundoplication technique. A devastating outcome of fundoplication is a patient with significant postoperative dysphagia which typically occurs when the wrap has been made too tightly with weakened contraction amplitudes or impaired peristalsis in the distal esophagus. These

patients do not respond to esophageal dilation (including pneumatic dilation) because the stricture caused by an external wrap of fundic muscle on the outside of the esophageal muscle. After the authors and colleagues followed a handful of patients over the years, they found that long term fundoplication-induced esophageal obstruction actually resulted in an esophagus which slowly becomes totally nonperistaltic. Therefore, to avoid an operative take down of the fundoplication, preoperative motility assessment must be considered as part of the workup for the patient. In a patient who has scleroderma and/or significant nonperistalsis, the surgical procedure of choice would be an esophageal resection with a gastric-proximal esophageal anastomosis; this is preferable to performing a fundoplication in the setting of substantially impaired peristaltic function. The other option is to perform a wrap so loose (over a 60 Bougie) that it would have minimal obstructive effect (this is accomplished best through a Belsey approach rather than a Nissen).

CRICOPHARYNGEAL DYSFUNCTION

Touching briefly on cricopharyngeal dysfunction, the author emphasizes that in clinical practice there should not be an interest in trying to understand cricopharyngeal motility. This extremely complicated area is undergoing significant methodological assessments and improvements. The author does not believe that the average practitioner in gastroenterology will be able to master this at the present time. In those motility centres that are making an effort to understand this area, it can be beneficial in certain instances. The author shares a case of tumour-related upper and lower esophageal sphincter achalasia related to a cerebellar tumour; a sleeve device was used to assess accurately the upper esophageal sphincter. The usual side hole techniques that are adopted in other parts of the gastrointestinal tract are not appropriate for the upper esophageal sphincter. A sleeve device or transducer approach may prove to be useful in the future. The current 'gold standard' for assessing a suspected 'transfer dysphagia' patient is to perform cine-esophagography and/or a solid bolus challenge as well as a speech therapy evaluation.

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