

ADVANCES IN GERD

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Update on the Use of High-Resolution Manometry in the Diagnosis of Achalasia



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G&H What spurred the most recent update of the Chicago Classification?

RY The Chicago Classification is the scheme for interpretation of high-resolution manometry (HRM). This classification has been an iterative process that requires updates and evolves over time. The previous version, 3.0, was published in 2015, and an update was needed given the tremendous advances in both clinical practice and research over the past 5 years. The most recent version, 4.0, was released January 2021.

An update is a major undertaking and has a large impact on practice. When the 52-member working group assembled, a poll was taken to consider whether there was a true need for an update and how much of the existing classification needed to be updated. The response was unanimous that a full update was needed.

G&H How are achalasia types distinguished in the latest Chicago Classification update?

RY The topic of achalasia underwent minor updates, and its diagnostic criteria in the Chicago Classification mostly remained the same. All 3 subtypes of achalasia are characterized by inadequate relaxation of the lower esophageal sphincter. This is interpreted as an elevated integrated relaxation pressure (IRP) as measured on manometry. The measure is the median of the IRP from 10 swallows.

Type I achalasia is the classic form of achalasia, indicated by failed peristalsis in all of the swallows along with an elevated IRP. Type II achalasia is considered to be a precursor of type I. Although all of the swallows

still fail, panesophageal pressurization is appreciated. If panesophageal pressurization is present in 20% or more of the swallows, the criteria for type II achalasia are met.

Type III achalasia is akin to spastic achalasia in which swallows are premature or spastic, as measured by distal latency, which is the period of time that it takes for the swallowing vector to reach the contractile deceleration

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point on manometry. The criteria for type III achalasia are met if the distal latency is less than 4.5 seconds in 2 or more swallows and if the remainder of the swallows are failed in the presence of an elevated IRP.

G&H What constitutes appropriate patient selection for HRM?

RY The Chicago Classification was primarily developed to address nonobstructive dysphasia. This means that the patient in question has undergone an upper gastrointestinal endoscopy, and obstruction, such as a stricture or

lesion, has been ruled out. Although one of the primary indications for HRM remains nonobstructive dysphasia, the application has evolved. For example, HRM is utilized to assess patients who have noncardiac chest pain or who are being evaluated for antireflux surgery, and in patients undergoing pH impedance testing.

G&H What impact does the latest Chicago Classification update have on current use of HRM?

RY Standardization was, and remains, a primary goal. Before the dissemination of the Chicago Classification, laboratories were using HRM differently in terms of protocols and interpretation schemes. This was problematic because of the risk of variable diagnoses and treatment recommendations and suboptimal outcomes. The lack of standardization also impeded collaboration and the ability to advance the field.

A major improvement in Chicago Classification version 4.0 is the standardization of the protocol for HRM. This protocol starts with 10 swallows while drinking small amounts—5 cc—of bolus. The swallow can be performed with the patient in either the supine or upright position. It is then recommended that the patient switch to the other position for at least 5 wet swallows.

The protocol also includes provocative maneuvers. These maneuvers are essentially a stress test for the esophagus. The 2 provocative maneuvers that are recommended are a multiple rapid swallow and a rapid drink challenge. Inclusion of solid food test swallows also can be considered.

G&H What now constitutes the standardized protocol for the differential diagnosis of achalasia on HRM?

RY First is evaluation of the initial 10 swallows. An abnormal median IRP raises the potential of achalasia. Failure of all of the swallows is diagnostic for type I or II achalasia. Having all abnormal swallows with at least 20% being spastic and the others failing is diagnostic for type III achalasia. It is, however, common to encounter an IRP that is abnormal with intact peristalsis. In this case, esophagogastric junction outflow obstruction (EGJOO) may be a differential diagnosis. In some instances, abnormal IRP in one position normalizes when the patient is performing swallows in another position. For this reason, it is important to perform swallows in both the supine and upright positions to confirm that there is a true manometric EGJOO.

In accordance with the standard protocol, the diagnosis of EGJOO requires an elevated IRP in both

the supine and upright positions, presence of intrabolus pressurization, and symptoms indicative of some type of physiologic obstruction (eg, dysphagia and/or noncardiac chest pain). Testing is also required to corroborate a diagnosis of EGJOO. Testing can take the form of a barium esophagram study or functional lumen imaging probe.

If the IRP is normal with the initial 10 swallows, the clinician should question whether the patient has dysmotility. Failure of all of the swallows is indicative of absent

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contractility. This is often seen in patients who have a mixed connective tissue disorder, such as scleroderma. It also can be present in patients with gastroesophageal reflux disease.

The next assessment is to determine whether at least 20% of the swallows are spastic, which would meet a diagnosis of distal esophageal spasm. If not, the next assessment is to determine whether 20% of the swallows are hypercontractile, which would signify a diagnosis of hypercontractile esophagus. Finally, if more than 70% of the swallows are ineffective and/or at least 50% of the swallows are failed, ineffective esophageal motility is present.

If none of these criteria are met, the patient should be considered to have normal esophageal motility per the standard protocol. It is also important to note that distal esophageal spasm and hypercontractile esophagus as seen on manometry do not always equate to a clinical pathology. The clinician must discern whether the symptomatology and manometry findings align with the right clinical picture. The Chicago Classification version 4.0 is not meant to encourage treatment that is merely based on patterns seen on manometry, but rather to take the entire clinical picture into consideration.

G&H When might diagnosis of achalasia be inconclusive on HRM?

RY There are several scenarios in which HRM findings could be inconclusive. One is, as mentioned, if the IRP

is elevated in one position (ie, supine or sitting) but not when the patient is in the other position, or if signs of classic achalasia are seen when a patient is in one position and both normal and failed swallows occur when the patient is in the other position. Another scenario that can sometimes occur is that of an IRP that does not quite meet the criteria for abnormal. For example, a general IRP threshold is 15 mm Hg, but some patients with achalasia are unable to generate IRPs of that level and may instead be in the range of 10 to 15 mm Hg. It is important to keep in mind that recommended thresholds are not lines in the sand. The entire clinical picture needs to be taken into account. In these inconclusive scenarios, supportive testing is important. Such testing includes a timed barium esophagram with a tablet and/or the functional lumen imaging probe.

G&H What further research is needed in this area?

RY Considerations are underway for Chicago Classification version 5.0. One topic that the working group had hoped to address for version 4.0 but could not owing to the current lack of research is related to distal esophageal spasm and hypercontractile esophagus. These patterns are not always reflective of primary dysmotility. Sometimes they are a response to reflux or related to opiate use or another cause. Better understanding of how to discern between primary vs secondary dysmotility patterns and the cause is a major priority for future updates.

Another area of interest is how impedance measurements combined with manometry can be of value in diagnostic impressions. Machine learning, including physics-based modeling and artificial intelligence, is also of great interest across the medical industry. Its impact may be incorporated in future iterations of the Chicago Classification.

Disclosures

Dr Yadlapati is a consultant for Medtronic (institutional), Ironwood Pharmaceuticals (institutional), Phathom Pharmaceuticals, Med DataLink, and Medscape. In addition, she provides research support for Ironwood Pharmaceuticals and is on the advisory board, with stock options, of RJS Mediagnostix. She was the primary author and co-chair of the Chicago Classification version 4.0.

Suggested Reading

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