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Can High Resolution Manometry Substitute for Videofluorography in Evaluation of Dysphagia?

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Abstract Background
Dysphagia has previously been reported in the inflammatory myopathies (IMs): inclusion body myositis (IBM), dermatomyositis (DM), and polymyositis (PM). Patients report coughing, choking, and bolus sticking in the pharynx. The utility of high-resolution impedance manometry (HRIM) for evaluating dysphagia has been investigated. Although HRIM provides precise pharyngeal pressure information, it has yet to be used as part of routine clinical practice for the assessment of dysphagia. The Purpose of this study was to determine whether the information obtained through HRIM in the evaluation of swallowing disorders in patients with IMs could reflect an abnormality not confirmed by VFSS.

Methods
A VFSS and HRIM were performed by nine patients: seven with DM and two with PM (median age, 52.0 years). Four patients manifested globus symptom and five patients had no symptom of dysphagia (Table 1). We evaluated the pharyngeal contraction and UES function fluorographically and compared the manometric parameters. Upper esophageal sphincter (UES) relaxation parameters were measured using a standard HRIM protocol. Peristalsis and bolus transit of the pharyngoesophageal segment were assessed using an HRIM-modified protocol in which the catheter was pulled back 10 cm. Penetration, aspiration and pharyngeal residue on VFSS were also recorded.

Results
Cricopharyngeal muscle dysfunction was noted in all four patients with globus symptom who had barium swallow studies. Three out of four patients manifested aspiration events. Five patients without dysphagia symptom didn't show any abnormality on VFSS (Table 2). A difference was observed between the manometric measures of patients with and without pharyngeal residue; UES residual pressures (UES-RP) were more than 8mmHg in patients with pharyngeal residue.

Conclusions
Dysphagia in IM patients appears to be more due to impaired muscle contraction and reduced hyolaryngeal excursion than the failed UES relaxation. Certain VFSS measures are correlated with measures of pressure assessed using HRIM. UES-RP could differentiate presence of pharyngeal residue and globus symptom with higher values (>=8mmHg) in patients with IMs. Furthermore, HRIM facilitated a comprehensive assessment of dysphagia mechanisms and recognition of subtle abnormalities not yet visible to the

naked eye on VFSS. HRIM can supplement the information obtained regarding the pharyngeal contraction and UES function, and overcomes the drawbacks of a VFSS by providing Objective measurements.

Table 1. Demographics of patients with inflammatory myositis

Patient	Diagnosis	Gender	Age (years)	Mobility	Current Diet	ASHA NOMS swallowing level scale	Globus symptom	Reports dysphagia for		
								Solids	Liquids	Secretion
1	DM	M	71	A	RD	5	Present			
2	DM	F	57	I	SD	3	Present	√	√	
3	DM	M	57	I	SD	3	Present	√		
4	PM	M	66	I	SD	3	Present	√		
5	PM	M	40	I	RD	7	Absent			
6	DM	F	53	I	RD	7	Absent			
7	DM	F	59	I	RD	7	Absent			
8	DM	F	30	I	RD	7	Absent	√	√	
9	DM	F	35	I	RD	7	Absent			√

DM: Dermatomyositis, PM: Polymyositis, M: Male, F: Female, I: Independent, A: Uses mobility aid, RD: Regular diet, SD: Soft diet

Table 2. VFSS findings in patients with inflammatory myositis

Patient	Aspiration (VFSS)	Penetration (VFSS)	Pharyngeal residue (VFSS)		UES pressure (mmHg)	UES residual pressure (mmHg)
			Vallecular pouch	Pyriform sinus		
1	Absent	Absent	√	√	Normal	Abnormal
2	Present	Absent	√	√	Normal	Abnormal
3	Present	Present	√	√	Normal	Abnormal
4	Present	Absent	√		Normal	Abnormal
5	Absent	Absent			Normal	Normal
6	Absent	Absent			Decreased	Normal
7	Absent	Absent			Normal	Normal
8	Absent	Absent			Normal	Normal
9	Absent	Absent			Normal	Abnormal