

## **3D ENDOVAGINAL ULTRASOUND VS. MAGNETIC RESONANCE IMAGING: THE EVALUATION OF LEVATOR ANI ANATOMY**

### Hypothesis / aims of study

To compare Magnetic Resonance Imaging (MRI) to 3D Endovaginal Ultrasound (US) in the evaluation of levator ani defects in women with pelvic floor disorders.

### Study design, materials and methods

A total of twenty-one subjects with pelvic floor (MRI) with complaints of pelvic floor disorders were included in this study. US imaging of the levator ani muscles (LAM) was performed in all subjects, and the structures of interest evaluated were the puboanalis (PA), puborectalis (PR), and pubovisceralis (PV) muscles. The right and left subdivisions were evaluated separately, and classified as: normal, normal with only minor irregularities, grossly abnormal, or absent. In addition, structures were also assigned a levator ani deficiency (LAD) score and classified by: no defect (complete attachment of muscle to the pubic bone), <50% detachment or loss, >50% detachment or loss, and completely detached or complete muscle loss. Two blinded observers assessed MRIs for levator muscle damage and two observers assessed US volumes. Paired data was analyzed with McNemar's test or Bowker's test of symmetry. A p value  $\pm 0.05$  was considered significant.

### Results

When unilateral LAM subdivisions were classified as 'normal', 'normal with minor irregularity', 'grossly abnormal', and 'absent', there were no significant differences between MRI and US by categorization of LAM defects. When compared by LAD score evaluation, there were no differences in the categorization of unilateral defects between MRI and US when comparing 'normal', '<50% detachment', '>50% detachment', and 'complete defect'.

### Interpretation of results

There were no difference between MRI and US in the categorization of LAM defects and LAD scores.

### Concluding message

3D US is comparable to MRI in its ability to identify both normal and abnormal LA anatomy.

**Table 1.** Comparison of the visualization of LA subdivisions

<b>Structure</b>	<b>MRI (n, %)</b>	<b>3D US (n,%)</b>	<b>p Value</b>
<b>Left PA</b>			
Normal	2 (11.1)	1 (5.6)	0.6767
Minor irregularity	4 (22.2)	7 (38.9)	
Grossly abnormal	6 (33.3)	6 (33.3)	
Absent	6 (33.3)	4 (22.2)	
<b>Right PA</b>			
Normal	1 (5.6)	1 (5.6)	0.9197
Minor irregularity	6 (33.3)	5 (27.8)	
Grossly abnormal	5 (27.8)	6 (33.3)	
Absent	6 (33.3)	6 (33.3)	
<b>Left PV</b>			
Normal	1 (5.0)	4 (20.0)	0.5184
Minor irregularity	9 (45.0)	7 (35.0)	
Grossly abnormal	8 (40.0)	8 (40.0)	
Absent	2 (10.0)	1 (5.0)	
<b>Right PV</b>			
Normal	2 (10.0)	4 (20.0)	0.8088
Minor irregularity	5 (25.0)	2 (10.0)	
Grossly abnormal	11 (55.0)	9 (45.0)	
Absent	2 (10.0)	5 (25.0)	
<b>Left PR</b>			
Normal	2 (9.5)	3 (14.3)	0.4021
Minor irregularity	8 (38.1)	9 (42.9)	
Grossly abnormal	11 (52.4)	6 (28.6)	
Absent	0 (0.0)	3 (14.3)	
<b>Right PR</b>			
Normal	1 (4.8)	3 (14.3)	0.3208
Minor irregularity	5 (23.8)	4 (19.1)	
Grossly abnormal	13 (61.9)	7 (33.3)	
Absent	2 (9.5)	7 (33.3)	
<b>Left LAD</b>			
No defect	3 (14.3)	10 (47.6)	0.2381
<50% detachment	6 (28.6)	3 (14.3)	
>50% detachment	5 (23.8)	5 (23.8)	
Completely detached	7 (33.3)	3 (14.3)	
<b>Right LAD</b>			
No defect	2 (9.5)	6 (28.6)	0.3208
<50% detachment	4 (19.1)	4 (19.1)	
>50% detachment	4 (19.1)	4 (19.1)	
Completely detached	11 (52.4)	7 (33.3)	

\*On MRI, the PA could not be evaluated in 3 patients and the PV in 1 patient; therefore, these were removed from analysis when comparing the respective subdivisions.

Disclosures

**Funding:** None **Clinical Trial:** Yes **Public Registry:** No **RCT:** No **Subjects:** HUMAN **Ethics Committee:** The University of Oklahoma Institutional Review Board **Helsinki:** Yes **Informed Consent:** Yes