

TO PROSPECTIVELY EVALUATE THE CHANGE IN LEVATOR HIATUS (LH) DIMENSIONS BEFORE AND ONE YEAR AFTER TREATMENT FOR PELVIC ORGAN PROLAPSE (POP)

Hypothesis

The dimensions of LH decrease after surgery for POP.

Aims of study

To determine the change in LH dimensions using 3D high- frequency endovaginal ultrasound (EVUS) before and one year after treatment for POP.

Study design, materials and methods

Women with prolapse and/or urinary incontinence attending the urogynaecology clinic between July and October 2009 were recruited. EVUS were performed using high multi-frequency (9-16 MHz) 360° rotational mechanical probe with a built-in 3D automatic acquisition system (Type 2052, ProFocus Ultra view, B-K Medical, Herlev, Denmark). 3D acquisition allows visualization of the relevant structures of the pelvis: symphysis pubis, urethra, levator ani muscle and anal canal. The transducer was inserted into vagina in a neutral position. The acquisition began from the bladder neck and terminated beyond the transverse perinei muscles. The referral point of the symmetry was fixed at the junction of the rami of the symphysis pubis (Gothic arch) located at 12 o'clock on the screen.

The following levator hiatal dimensions were measured: antero posterior (AP), left to right (L-R) width and area [1]. Patients were followed up at one year when EVUS was repeated.

Results

89 women had symptomatic prolapse. Of these 43 opted for surgery and 46 for non surgical treatment. The mean age was 51.98 years (SD \pm 20), BMI 29.3 kg/m² (SD \pm 6.5) and median parity 2 (range 0-7). 25.3% women had previously undergone hysterectomy, 14.6% and 17.7% had previously undergone prolapse and incontinence surgery respectively.

Of the patients with symptomatic prolapse, 43 had prolapse surgery (48.3%) [32 anterior repairs, 10 posterior repairs, 16 vaginal hysterectomies, 2 sacrospinous fixation and 2 sacrocolpopexy]. Out of 43 women who opted for surgical treatment, 40 (87%) attended for 1 year follow up. 43 out of 46 (93%) women in non-surgical treatment group came for 1 year follow up. 77 scans were analyzable at 0 months, 41 at 3 months and 73 at 1 year.

Table 1 demonstrates the median and the interQuartile range of the LH dimensions at baseline and at 12 months in women with POP with different management options.

Table 2 shows that LH dimensions decrease in AP, width and area at 12 months after surgery compared to baseline. However, there was no change in any of the dimensions after pessary insertion and when the patient did not receive any treatment.

A significant difference (p value <0.001) in all three LH dimensions was noted in the surgical group. However, there was no significant change in LH dimensions in women who opted for conservative management.

Table 1: LH dimensions (Anteroposterior: AP; Width: L-R; Area) at baseline and at 12 months in women with POP with different management options.

	Surgery		Pessary		No treatment	
LH dimensions	Baseline	12 months	Baseline	12 months	Baseline	12 months
	38	38	7	6	32	29
AP (mm)						
Median	56.4	50.0	57.9	56.0	56.2	56.2
InterQuartile range	10.30	8.00	11.90	8.80	10.00	10.50
L-R width (mm)						
Median	42.1	35.0	42.9	42.8	41.0	41.7
InterQuartile range	8.90	8.00	9.10	8.90	5.30	5.20
Area (cm ²)						
Median	16.10	13.00	16.90	15.55	15.95	16.30
InterQuartile range	4.90	2.00	7.40	2.90	4.25	4.20

Table 2: Difference in LH dimensions at 12 months compared to baseline using Wilcoxon ranked scores in women with POP with different management options.

LH dimensions	Surgery		Pessary		No treatment	
	Change in median scores	p-value	Change in median scores	p-value	Change in median scores	p-value
AP (mm)	-7.60	<0.001	0.00	0.317	0.00	0.180
L-R width (mm)	-3.70	<0.001	0.00	0.317	0.00	0.180
Area (cm ²)	-2.70	<0.001	0.00	0.317	0.00	0.180

Interpretation of results

Correlations have been reported between increased LH size and pelvic organ descent [2]. However the changes in LH dimensions following surgical treatment of POP have not been studied using EVUS. Our results demonstrate that 12 months after surgery, there is significant decrease in all LH dimensions. However, in women who opted for either pessary insertion or no treatment, the LH dimensions remained almost the same at 12 months. Long term follow up data is required to ascertain if these assessments can be used as outcome parameters in POP repairs.

Concluding message

In contrast to conservative management, there is a significant decrease in LH dimensions 12 months following surgery. This may be an important factor in prognosticating outcome of prolapse surgery.

References

1. Santoro GA, Wieczorek AP, Stankiewicz A, Wozniak MM, Bogusiewicz M, Rechberger T. High resolution three-dimensional endovaginal ultrasonography in the assessment of pelvic floor anatomy: a preliminary study. *Int Urogynecol J* 2009; 20 (10): 1213-1222.
2. Tunn R, Delancey JOL, Howard D, Ashton-Miller JA, Quint LE . Anatomic variations in the levator ani muscle, endopelvic fascia and urethra in nulliparas evaluated by magnetic resonance imaging. *Am J Obstet Gynecol* 2003; 188: 116-121.

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<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Bromley ethics committee, South London.
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes