

References

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<b>COMPARISON OF TRANS-ANAL SONOGRAPHY AND MRI MAPPING OF INTERNAL AND EXTERNAL OBSTETRIC ANAL SPHINCTER DEFECTS</b>

**Aims of study :** To compare trans-anal sonography and body coil MRI in the assessment of obstetric anal sphincter injury.

**Methods:** 14 consecutive women with a history of frank fecal incontinence following primary repair of recognised obstetric anal sphincter disruption were recruited from a dedicated perineal clinic 14 weeks postpartum. Two of these women had recognised recto-vaginal fistulae identified at clinical examination.

Anatomical integrity of the internal ( IAS ) and external ( EAS ) anal sphincter mechanisms was assessed using trans-anal sonography and body coil MRI. Trans-anal sonography was performed in the prone position using a 360° 10MHz rotating endoprobe. MRI imaging was performed using a 1.5T Magnetom imager. Oblique axial T1W pre and post gadolinium and T2W turbo spin echo three sequences were performed on all patients using a phased array pelvic coil. Localisation of the anal sphincter was achieved with the aid of a sagittal scout . Gadolinium was used to enhance scar tissue and aid the identification of anal sphincter injury.

Anal sphincter injury was graded for both the IAS and EAS according to a) the degree of sphincter disruption ( partial or full thickness ) and b) the extent of the defect according to the number of quadrants of the anal sphincter mechanism involved. The thickness of the IAS was also measured at two standardised points corresponding to the three and nine o' clock position with the patient in the lithotomy position. The extent of EAS injury was also graded according to the number of muscle components of the sphincter mechanism involved ( subcutaneous, superficial or deep).

Image analysis for both ultrasound and MRI was performed by two independent radiologists blinded to the patients history. The duration of each radiological procedure and patient tolerance assessed by means of a visual analogue score was recorded. These data were then transferred to an IBM compatible database and statistical analysis was performed using a dedicated software package.

**Results:** Trans-anal sonography was well tolerated compared to body coil MRI which most women found uncomfortable. The mean duration of the ultrasound assessment was significantly shorter compared to MRI [ US mean 6, range 4 - 10 minutes / MRI mean 45 range 25 -60 minutes, p<0.001 Fishers exact test ]. The mean thickness of the internal (IAS) sphincter measured at two standardized points were comparable for both ultrasound( mean 1.6 / range 0 -3.4mm ) and MRI ( mean 1.6mm / range 0 -3.5mm)( r = 0.98). 12 IAS defects were identified at both ultrasound and MRI. The type and extent of IAS injury was comparable for both methods ( Table 1 ). 14 EAS defects were identified at ultrasound compared to only 4 at MRI. The extent and site of EAS injury identified at MRI did not compare with ultrasound ( Table 2 ). MRI however identified two recto-vaginal fistulae not detected at ultrasound.

**TABLE 1: IAS DEFECTS IDENTIFIED AT TRANS-ANAL SONOGRAPHY COMPARED TO BODY COIL MRI**

	US	MRI
<b>Number of IAS defects</b>	12	12
<b>Type of IAS defect</b>		
Full thickness	6	6
Partial thickness	6	6
<b>Extent of IAS defect</b>		
1 quadrant	6	3
2 quadrants	3	9
3 quadrants	3	0

TABLE 2 : EAS DEFECTS IDENTIFIED AT TRANS-ANAL SONOGRAPHY COMPARED TO BODY COIL MRI

	US	MRI
Number of EAS defects	14	4
<b>Type of EAS defect</b>		
Full thickness	11	4
Partial thickness	3	0
<b>Extent of EAS defect</b>		
1 quadrant	4	0
2 quadrants	7	4
3 quadrants	3	0
<b>Site of EAS defect</b>		
Superficial	4	0
Deep	0	0
Both	10	4

**Conclusion:** Trans-anal ultrasound is superior to body coil MRI in identification and delineation of EAS disruption following obstetric injury. Body coil MRI allows comparable assessment of IAS injury and is superior for detection of recto vaginal fistulae.

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THE SIGNIFICANCE OF AN OPEN BLADDER NECK IN THE EVALUATION OF THE FEMALE STRESS URINARY INCONTINENCE

**Aims of Study**

Open bladder neck on resting cystourethrography was known to be a risk factor for stress urinary incontinence and Blaivas defined this finding as type III. There are 21% of women who have an open bladder neck at rest when the bladder is filled to maximum capacity. But not all of these women have stress urinary incontinence and its clinical significance was not well known. The purpose of this study was to determine the prevalence of an open bladder neck at rest in stress urinary incontinence women and to assess its significance.

**Methods**

We evaluated the presence of open bladder neck during a resting cystourethrography and related the findings to a type of stress urinary incontinence and to other factors. Cystourethrography was performed on 356 neurologically normal women in the age range 25 to 77 (average age 50 years), presented with stress urinary incontinence. After filling the bladder to the maximum capacity, the bladder neck was viewed in an anteroposterior and oblique position to see if it opened or closed. We classified the patients into two groups according to the presence of open bladder neck on resting cystourethrography. Two groups were compared with the results of the patient variables, including incontinence type; age; incontinence grade; duration of incontinence; associated presenting symptoms of frequency, urgency, urge incontinence; estrogen status; history of previous pelvic surgery, anti-incontinence surgery, or previous pelvic irradiation; gravidity; parity; the birth weight of baby; bladder neck descent on voiding cystourethrography. We determined type of incontinence by Valsalva leak point pressure (VLPP): 1) intrinsic sphincteric deficiency (ISD): VLPP < 60 cmH<sub>2</sub>O, 2) equivocal: VLPP 60-90 cmH<sub>2</sub>O, 3) anatomical incontinence (AI): VLPP > 90 cmH<sub>2</sub>O. The data were subjected to the t-test, ANOVA, chi-square test, and the Wilcoxon rank sum test.

**Results**

At maximal bladder capacity, 192 (53.9%) of the 356 patients had open bladder neck at rest. One hundred ten women (30.9%) were ISD and 146 (41.0%) were AI. There were significant differences in between incontinence type, VCUG type, estrogen status, number of delivery, and age according to the presence of open bladder neck.

Open bladder neck	VLPP (cmH <sub>2</sub> O)*			Incontinence Grade*			Estrogen Status		Age*	VCUG* Type			Parity*
	<60	60-90	90<	I	II	III	+	-	Mean	I	IIa	IIb	Mean
Present	65%	52%	47%	44%	60%	68%	47%	62%	51.3±9.5	52%	48%	76%	2.7±9.5
Absent	35%	48%	53%	56%	40%	32%	53%	38%	48.3±9.5	48%	52%	24%	2.0±0

p < 0.05 (t-test, chi-square test, Wilcoxon rank sum test, ANOVA)

There were significantly higher rate of ISD (37.5%) in women with open bladder neck than in women without open bladder neck (23.2%) (p=0.01) and average VLPP of women with open bladder neck (82.8 cmH<sub>2</sub>O) was lower than that of women without open bladder neck (96.4 cmH<sub>2</sub>O) (p=0.003). There were more open bladder neck at rest in ISD patients (65%) than in AI patients (47%) (p=0.01).