441

Roos A[1], Abdool Z[1], Sultan A H[1], Thakar R[1]
1. *Mayday University Hospital*

PREDICTING ANAL SPHINCTER DEFECTS; THE VALUE OF HISTORY, CLINICAL EXAMINATION AND MANOMETRY

Hypothesis / aims of study

Clinical findings associated with anal sphincter defects include the absence of the normal appearance of corrugator cutis ani, palpation of a sphincter defect, reduced anal resting tone and squeeze contraction on digital examination. However the usefulness and the predictive value of these findings are unknown. It has previously been shown that the absence of a perineal scar does not exclude underlying sphincter damage [1]. Additionally, anal manometry is a frequently used tool in the assessment of faecal incontinence. However there are no definitive cut-off values that discriminate between an intact sphincter and the presence of an anal sphincter defect.

The aim of this study was to firstly determine whether sphincter defects (as diagnosed by endoanal ultrasound) could be detected by modalities such as anal incontinence score, findings on clinical examination and anal manometry. Secondly we aimed to establish manometric cut-off values associated with anal sphincter defects.

Study design, materials and methods

Women who complained of anal incontinence and those who sustained obstetric anal sphincter injuries (OASIS) attending the perineal clinic over a 12 month period were included in this study. Bowel symptoms were scored using the modified St Marks Score which gives a total score from 0 (complete continence) to 24 (complete incontinence). We modified the St Marks Score by grading faecal urgency on a 5 point frequency scale, scoring it from 0 (never) to 4 (always), as opposed to the original description of 4 (present) or 0 (absent).

For each patient, clinical examination included perineal inspection, vaginal examination (Oxford pelvic floor strength) and digital assessment. This was followed by anal manometry (Stryker 295 air-filled system) and endoanal ultrasound (B&K Viking 2400, Gentofte, Denmark) with the patient in left lateral position. Using the 360 degree rotating endoanal probe two-dimensional and three-dimensional images were collected and reviewed at 4 levels: puborectalis as level 1 and subdivision of the EAS into 3 levels: deep (proximal), superficial (mid) and subcutaneous (distal). The ultrasound images were analysed by two of the authors independently and blinded to each others results. The two outcomes were compared and when there was discrepancy, one of the senior authors arbitrated.

Statistical analysis was performed using Chi Square or Fisher's exact test where appropriate, and Mann Whitney U test for non-parametric continuous variables. Kruskal Wallis test was done to compare digital anal resting tone and squeeze contraction to manometric results. Receiver Operating Curves (ROCs) were plotted to calculate a cut-off value of manometric results predictive for an intact sphincter. Cut-off values were set to minimise the number of undiagnosed defects and we therefore maximised specificity.

Results

128 women completed the study. The mean age was 32 years (SD 5.6). The reasons for visiting the perineal clinic were 10 weeks follow up after sustaining OASIS in 79 (62%), subsequently pregnant following OASIS in 41 (32%) (37 antenatal and 4 postnatal) and seeking help for bowel symptoms in 8 (6%).

In 34 (27%) women a defect of the anal sphincter was detected on endoanal ultrasound. Twelve women had isolated EAS defects, 19 combined EAS and IAS defects and 3 had isolated IAS defects.

The Modified St Marks Score was not significantly different between women with defects (median 0 (range 0-19)) and those without (median 0 (range 0-15)), p=0.33.

Clinical examination in women with and without anal sphincter defects is presented in Table 1. Lower anal resting tone on digital examination was associated with lower manometry resting pressure ($p<0.001$). Similarly, lower squeeze contraction was associated with lower manometry squeeze pressure ($p<0.001$) and squeeze increment ($p<0.001$). Furthermore, perineal body length and modified Oxford score were not significantly different between those with and without sphincter defects (p=0.74 and 0.13 respectively). However manometry findings of anal canal length, maximum resting pressure, maximum squeeze pressure and squeeze increment were significantly lower in women with defects ($p<0.001$). Proposed cut-off values for these significant variables and their sensitivity and specificity are presented in Table 2.

Interpretation of results

Our study population consisted of young women who were mostly asymptomatic for bowel problems. Anal incontinence scores do not always reflect an underlying sphincter defect in this group of postpartum women. Clinical examination is accurate in situations were the anal sphincter is intact, however the sensitivity falls when there is a sphincter defect. The proposed cut off values for anal manometry measurements (Table 2) enabled identification of more than 90% of sphincter defects. However the resultant low sensitivity implies that a large proportion of women with an intact sphincter will also have manometry findings under the cut-off score.

Concluding message

Compared to women who have an intact sphincter, clinical assessment (perineal, vaginal and anal) alone has a poor sensitivity in women with persistent endoanal sphincter defects following OASIS. The proposed manometric cut-off values can be used to identify those women who will need further assessment by endoanal ultrasound.

Table 1: Clinical findings on perineal inspection and digital rectal examination compared to endoanal ultrasound findings

		Endoanal ultrasound		***sensitivity***	***specificity***
		Defect (N=34)	*Intact (N=94)*		
Corrugator cutis	Intact	25	91		
	Defect	9	3	26%	97%
Digital defect	Intact	29	92		
	Defect	5	2	15%	98%
Digital resting pressure	Normal	19	75		
	Reduced / Absent	15	19	44%	80%
Digital squeeze contraction	Normal	12	54		
	Reduced / Absent	22	40	65%	57%

Table 2: Proposed cut-off values of manometric measurements and their sensitivity and specificity to detect intact sphincters

	AUC	**Cut-off value §**	**Sensitivity**	**Specificity**
Anal length (mm)	0.708	27.5	34%	97%
Resting pressure (mmHg)	0.800	53.5	52%	91%
Squeeze pressure (mmHg)	0.837	94.0	63%	91%
Squeeze increment (mmHg)	0.754	48.5	44%	91%

* AUC: ROC area under the curve

§ Test is positive for an intact sphincter if it is greater than or equal to cut off value

References

1. Frudinger A, Bartram CI, Spencer JAD, Kamm MA. Perineal examination as a predictor of underlying external anal sphincter damage. BJOG 1997;104:1009-1013

Specify source of funding or grant	**none**
Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**London-Surrey Borders research ethics committee**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**