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CAN ANAL SPHINCTER DEFECTS BE IDENTIFIED BY PALPATION?

Hypothesis / aims of study

Obstetric anal sphincter injuries (OASI) are an important cause of anal incontinence both in the short and long term. The true incidence of OASI seems to be higher than reported and may be over 15% after a first vaginal birth (1). Anatomical and functional outcomes after primary repair of OASI are assessed using ultrasound and anal manometry, techniques that are not readily accessible to many clinicians. Digital rectal examination is the most basic assessment method of anal sphincter function and integrity. To date, however, there is little data on palpation after OASI. The aim of this study was to correlate clinical findings with sonographic diagnosis of OASI. We used translabial 4D ultrasound as a novel, non-invasive technique to diagnose trauma to the anal sphincter complex (1).

Study design, materials and methods

This is an observational cross sectional study on women seen 6-10 weeks after primary repair of OASI in a dedicated perineal clinic between Nov. 2008 and May 2014. All patients underwent a standardised interview including the St Mark's incontinence score (SMIS), a digital rectal examination, and 4D translabial ultrasound (US) using a GE Kretz Voluson 730 Expert, E8 or Voluson i system as previously described (2). US was performed supine and after voiding on maximal Valsalva and on pelvic floor muscle contraction (PFMC). Archived volume data sets were analysed months after acquisition, blinded to all clinical findings. 4D View v10 (GE Kretz Medizintechnik) was used for postprocessing analysis.

Digital rectal examination was performed at rest and on voluntary contraction. Resistance to insertion was scored as follows: 0=open at rest; 1=no resistance; 2=poor; 3=fair; 4=good; 5=unable to insert finger. Maximum anal squeeze was graded as follows: 0=nothing; 1=flicker; 2=weak/partial; 3=moderate+slight lift; 4=good+lift; 5=able to squeeze and lift against resistance. Defects were rated as present or absent, at rest and on contraction.

Tomographic Ultrasound Imaging (TUI) was used to evaluate external and internal anal sphincter trauma on PFMC. For patients who failed to perform PFMC, US volumes acquired at rest were analysed. On TUI a set of 8 slices was obtained. We bracketed the entire external anal sphincter (EAS) by placing one slice cranial to the EAS (at the level of the m. puborectalis) and another caudal to the internal anal sphincter (IAS) at the level of the anal verge, with variable interslice interval depending on the length of the EAS, leaving 6 slices to demonstrate the entire muscle (Figure 1A). The IAS was assessed similarly, with the first slice placed at the level of the ano-rectal junction, the most distal slice at the level of the subcutaneous portion of the EAS (Figure 1B). Interslice intervals were adjusted as necessary. Individual slices were rated as positive if there was a defect of >=30 degrees of EAS or IAS circumference. Significant EAS and IAS defect was diagnosed if >=4 slices were rated positive(3). Cohen's kappa was used to calculate agreement between digital rectal examination findings and sonographic diagnosis of significant EAS and IAS defects.

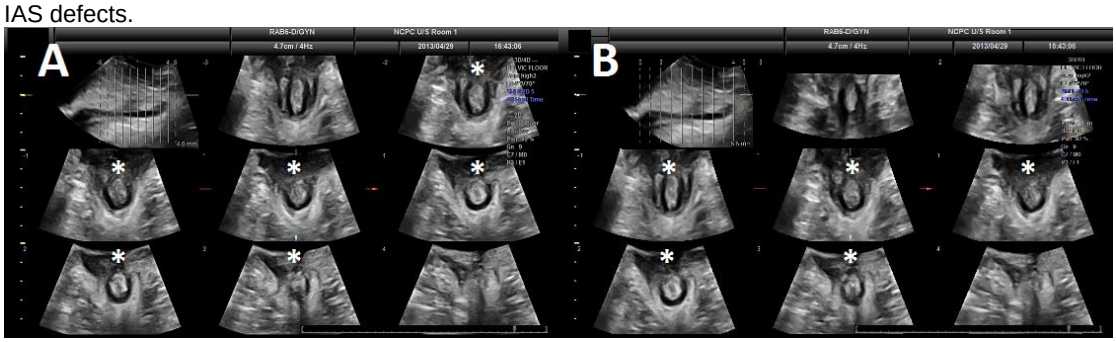

Figure 1: Assessment of EAS and IAS by translabial 4D tomographic ultrasound. (A) shows a significant EAS defect (6/6 slices of EAS length), (B) an IAS defect (5/6 slices of IAS length). Note that a much higher interslice interval is required for IAS assessment.

Results

245 patients were seen during the inclusion period for follow-up after primary repair of OASI. Mean age was 29 (17 - 43) years; 180 (73%) were primiparous. They were seen at a mean of 67 (15-278) days postpartum. 157 (64%) delivered normal vaginally, 72 (29%) by Vacuum and 16 (7%) by Forceps at a mean gestation of 40 (33 - 44) weeks. Mean birth weight was 3600 (2185 - 4990) g. 80 (33%) had an episiotomy, 70 (29%) induction of labour, 74 (30%) intrapartum syntocinon augmentation and 63 (26%) an epidural. Mean duration of 1st and 2nd stage were 398 (SD 326) and 65 (SD 48) min respectively. A 3a perineal tear was diagnosed in 97, 3b in 60, 3c in 32, and a 4th degree tear in 22. In 39 cases a 3rd degree tear was not further classified. 62 (62/240, 25%) women reported symptoms of anal incontinence at follow up. The median SMIS was 0 (0 -18), with 16 scores >=5 . FI for solid stool and/or liquid stool was reported by 16 (7%); flatus incontinence by 38 (38/244, 16%), faecal urgency by 27 (27/240, 11%).

PR examination data was not available in 14 patients including 4 who refused a PR examination at follow up, and not complete in 9, leaving 222. Ultrasound volumes were not available for EAS assessment in 3 patients (missing in 2 and of insufficient quality in one), leaving 242 volume datasets for EAS analysis. IAS assessment was not available in 12 patients because of missing volume leaving 233 volume datasets for IAS assessment. A comparison of EAS data and palpation was possible in 220, of IAS data and palpation in 212 cases.

A sphincter defect at rest was detected clinically in 19 and on contraction in 18 patients. Both mean resistance to anal digitation and mean of maximum anal squeeze was 3 (range 1-5 and 0-5 respectively). On TUI we diagnosed significant abnormalities of the EAS in 111 (46%) women, and of the IAS in 120 (52%) women. Agreement between digital examination and TUI as regards defects was poor (kappas of between 0.03 and 0.08), although there were significant associations between palpatory findings and both SMIS and EAS defects on TUI (Table 1). Sensitivity, specificity, positive and negative predictive value of rectal palpation in detecting sonographic EAS defects were 12%, 96%, 71% and 57% respectively.

	SMIS>=5 (n=14)	**P value**	**EAS defect on TUI (n=99)**	**P value**	**IAS defect on TUI (n=113)**	**P value**
Defect at rest (N/Y)	4.8% vs 21%[#]	0.005	43% vs 71%	0.03	52% vs 65%	0.33
Defect on PFMC (N/Y)	4.9% vs 22%[#]	0.004	43% vs 65%	0.09	52% vs 65%	0.33
Resistance to insertion	2.4 (1) vs 3.1 (0.7)[#]	0.016*	2.9 (0.8) vs 3.2 (0.7)	0.018*	3 (0.7) vs 3.1 (0.7)	0.12*
Max. squeeze	2.0 (0.8) vs 2.6 (0.9)[#]	0.012*	2.4 (1) vs 2.7 (1)	0.009*	2.3 (1) vs 2.8 (0.9)	0.0006 *

*Table 1: Correlations between digital rectal examination with SMIS=>5 and sonographic diagnosis of residual EAS and IAS defects after primary repair. Values are mean (SD) unless stated otherwise. * Mann-Whitney U test. Resistance and squeeze were rated 0-5.*

Interpretation of results:

In this study on women seen after primary repair of OASI, we found an association between rectal palpation and sonographic diagnosis of residual EAS defects, but agreement between the methods was poor. Sensitivity and positive predictive value of digital rectal examination was limited. Women with significant EAS defects on translabial ultrasound were found to have poorer sphincter function clinically as determined by resistance to digital insertion and strength on maximum anal squeeze. The difference was, however, small and is unlikely to be clinically useful. IAS defects did not seem to be significantly associated with clinical findings except for a lower maximum anal squeeze.

Concluding message:

Digital rectal examination does not seem to be sufficiently sensitive for the diagnosis of residual sphincter defects after primary repair of OASI. Imaging is required for evaluation of sphincter anatomy after repair.

References

1. UOG 2013;42:461-466
2. UOG 2004;23:615-625
3. Neurourol Urodyn 2014;33:856-858

Disclosures

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