285

van Delft K[1], Thakar R[1], Sultan A[1]
1. *Croydon University Hospital*

IS THERE A RELATIONSHIP BETWEEN ANAL CANAL DIMENSIONS AND ANAL INCONTINENCE FOLLOWING CHILDBIRTH?

Hypothesis / aims of study

Posterior compartment structures seen on 3D endovaginal ultrasonography (EVUS) have good anatomical correlation in cadaveric sections (1). Unlike 3D Endoanal Ultrasonography, EVUS provides undisturbed anatomical images (1). Anal incontinence can have a devastating effect on women's quality of life and can be evaluated using the validated St. Mark's Incontinence Score (SMIS) (2). The aim of this study was to evaluate the anatomical changes in the anal canal before and after childbirth using EVUS.

Study design, materials and methods

In this prospective longitudinal study, 269 primigravida were included (median 36 weeks gestation; range 34-41) and 70% (n=189) were followed-up postpartum (median 13 weeks; range 10-26). 48 women had a caesarean section (group 1) and 143 women delivered vaginally (group 2). In both visits, SMIS was carried out, perineal body length was measured clinically and EVUS was performed using a biplane transducer (Type 8848, 5-12MHz, BK Medical). Scans were analysed in the midsagittal and axial plane (Fig1), by an independent investigator. To determine interrater reliability, 20 random scans were analysed by a second investigator. Differences between and within groups were analysed using Independent samples T-test and paired student T-test respectively. Intraclass correlation coefficient (ICC) and limits of agreement (LOA) were calculated for inter-rater reliability.

Results

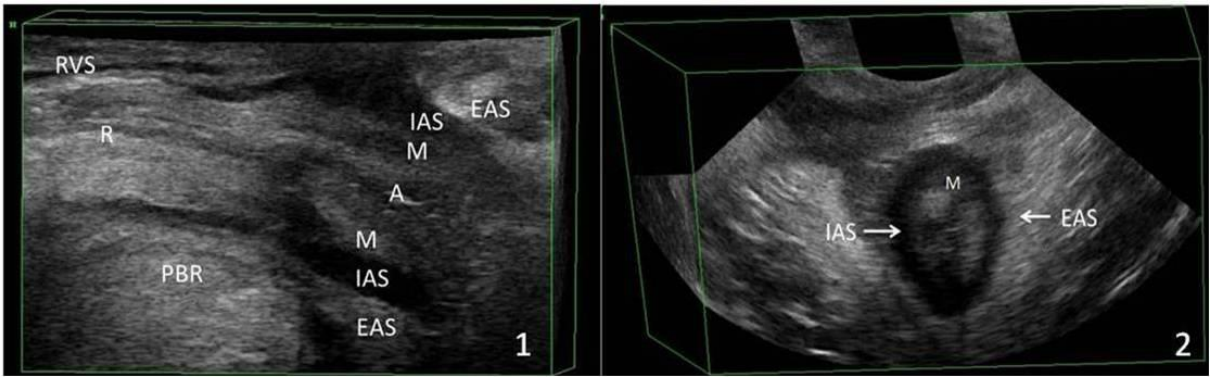
All structures could be identified by both investigators. The random sample used for the inter-rater analysis was similar to the large sample. Anovaginal distance (AVD) (which is a surrogate for the perineal body) decreased and anorectal angle (ARA) increased following childbirth, with no statistical difference between the two groups. Perineal body measurements on EVUS were smaller than on clinical examination. ICC for AVD was fair (0.29) with acceptable LOA, ICC for ARA is moderate (0.57) with acceptable LOA. Before delivery, no rectovaginal septum (RVS) defect was found. One RVS defect was found following a forceps delivery. Median antenatal SMIS was 0 (range 0 – 12). Median postnatal SMIS was 0 (range 0 – 24), with significantly higher SMIS in the vaginal delivery group (p 0.026).

Table 1: Posterior compartment measurements

Variable	Group 1 (n=48)			Group 2 (n=138)			Postnatal Δ between groups p-value
	Antenatal Mean (±SD)	Postnatal Mean (±SD)	Δ within group 1 p-value	Antenatal Mean (±SD)	Postnatal Mean (±SD)	Δ within group 2 p-value	
AVD in mm	23.5 (3.4)	20.5 (3.9)	<0.001	22.2 (4.3)	20.3 (3.5)	<0.001	0.13
ARA in degrees	150 (7.4)	157 (8.1)	<0.001	151 (8.1)	157 (7.6)	<0.001	0.98
Perineal Body (mm)	31.6 (5.6)	26.3 (4.6)	<0.001	31.4 (6.0)	26.0 (5.4)	<0.001	0.87

Δ difference; SD standard deviation

Fig1: Normal posterior compartment on EVUS



Midsagittal (1) and axial view (2). RVS, rectovaginal septum; EAS, external anal sphincter; IAS, internal anal sphincter; M, mucosa; A, anus; R, rectum; PBR, puborectalis

Interpretation of results

This study has demonstrated that there are distinct changes in the AVD, ARA and perineal body after childbirth irrespective of the mode of delivery. The decrease in size of the perineal body after delivery concurs with another study (3) and can be explained by the physiological expansion in the antenatal period. There was a discrepancy in the size of the perineal body between clinical and scan measurements because unlike clinical assessment, the scan measures muscle bulk which is more

relevant. The SMIS increased significantly following vaginal delivery. By contrast, the ARA increased following both vaginal and caesarean delivery, casting doubts on previous hypotheses regarding the mechanisms maintaining continence.

Concluding message

The significant postnatal changes on ultrasound of the posterior compartment found after both vaginal delivery and caesarean section suggests that pregnancy itself, rather than childbirth, can impact on anorectal anatomy.

References

1. Int Urogynecol J 2012;23:1047-53
2. Int Urogynecol J Pelvic Floor Dysfunct. 2009;20:407-10
3. Int Urogynecol J 2012. DOI 10.1007/s00192-012-1932-7

Disclosures

Funding: None **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** National Research Ethics Service South West London committee (REC 10/H0806/87) **Helsinki:** Yes **Informed Consent:** Yes