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TOPOGRAPHIC SAGITTAL ANATOMY OF THE PERINEUM IN WOMEN

Hypothesis / aims of study

Knowledge of the perineal sagittal anatomy is important as spontaneous tears during vaginal deliveries mostly affect the midline. Intraanal sonography will not reveal all structures. The objective of this study was to visualise the perineal membrane, the puboperineal muscles, the central point (1) and the conjoined longitudinal muscle in pregnant nulliparous women and to measure the sagittal area, length and thickness of the external anal sphincter (EAS), the height of the perineal body (2), the length of the perineal membrane and the height of the perineum by transvaginal ultrasound.

Study design, materials and methods

45 pregnant nulliparous women in week 32-40 left informed consent. All had linear and circular transvaginal and transanal ultrasound in the dorsal lithotomic position. The probe used was a rectal biplane probe with a linear window (64 mm, 10 MHz and a semicircular window (200°, 9 MHz, Hitachi EUB 6500, EUP U553, Hitachi, Tokyo, Japan). A transvaginal sagittal linear scan of the perineum and the anal canal was stored. The semicircular window of the probe was used to take repeated vaginal scans of the anal canal from the level of the puborectal muscle to the anal verge. Intra-anal scans where taken with the linear scanner at 9-3 o'clock and at 6 o'clock (8 images) and with the semicircular window when withdrawing the probe out from the anal canal. All scans were stored at magneto optical discs and analyzed off-line. The linear intra-anal scans were compared with the linear vaginal scan by one investigator. Two observers described independently the perineal structures seen in the transvaginal sagittal linear scan (fig 1). The height of the perineum from outer rim of the IAS to the probe was measured. The length and height of the EAS and the perineal body together with the area of the EAS was measured from the vaginal sagittal image (fig 2). The study was approved by the Research Ethics Committee of the Southern Swedish Region.

Results

The perineal body, the perineal membrane and the central point were hypoechoic. The different structures were not able to distinguish from each other in the perineal body. The primary investigator identified the EAS, the internal anal sphincter, the conjoined longitudinal muscle and the central point in all 45 pregnant women, when using linear and circular vaginal and anal ultrasonography. These structures were with few exceptions also identifiable in a single longitudinal image, and the findings were essentially reproduced by the second observer, except for the longitudinal muscle and the central point, which were only identified in 29 and 34 of the 45 women, respectively. The length of the perineal membrane was measured from the outer rim of the internal anal sphincter; a short length was seen together with a low perineal height (tab 1).

Table 1.

	Perineal height (mm)	EAS length (mm)	EAS height (mm)	EAS area cm²	Perineal body length (mm)	Perineal body height (mm)	Perineal membrane length (mm)
Median range	21.5 (13.9-33)	14.9 (5.7-20.3)	7.9 (4.9-10.8)	0.89 (0.52-1.46)	6,5 (2.5-11.6)	13.9 (8.9-18.9)	11.4 (4.9-25.4)

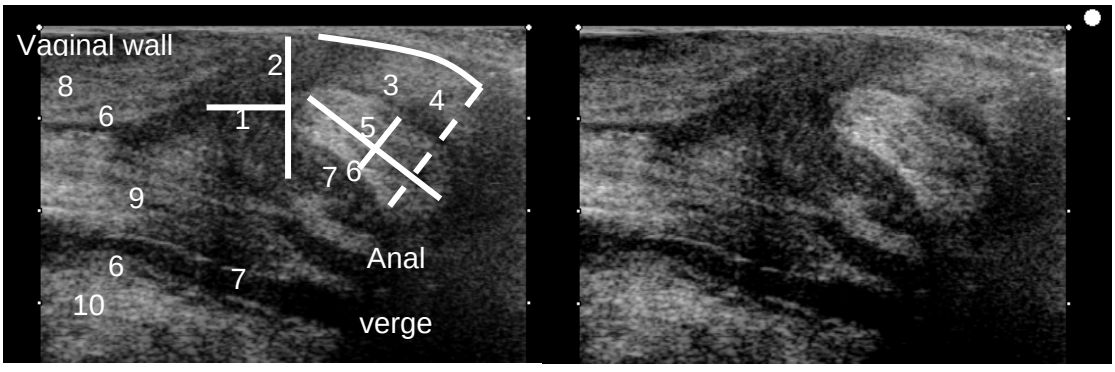

Figure 1

Sagittal transvaginal scan of the perineum and the anal canal with linear rectal transducer. The right image is a copy of the left. The perineal body (1) is hypoechoic. It is composed by intermingling fibres from adjacent structures. The internal anal sphincter (7) can not be separated from the perineal body by transvaginal scanning. Even the conjoined longitudinal muscle (6) will get hypoechoic and impossible to detect when passing trough the perineal body. The

rectovaginal septum (8) and the perineal membrane (2) are anchored to the perineal body. The puboperineal muscle (3) is found just cranial to the external anal sphincter (5), caudal to the perineal membrane. The rectal columns (9) fill the lumen of the anal canal. The puborectal muscle (10) is seen caudal to the proximal anal canal. The central point (4) is described as a stabilizer of the perineum and can be an impressive structure when torn at a vaginal delivery. The curved white line follows the vaginal wall. The white vertical line to the left represents height at perineal body, the left horizontal line the length of the perineal body. The two lines in a cross represent the height and length of the external anal sphincter, the dotted white line the perineal height.

Interpretation of results

The perineum can be described both concerning topography and anatomy using transvaginal linear sonography with a biplane rectal probe. The finding is of importance when repairing obstetrical tears and can also be important when doing perineal repairs together with repair of rectocele. The lack of knowledge of the topography can have resulted in presentations of new methods of surgery for second degree obstetric tears without mentioning all the anatomical structures repaired (3). It may also have resulted in the incomplete descriptions in text books of obstetrics and gynecology about perineal injuries and how to repair such injuries. This method might give an opportunity to describe the success of the repair of second degree obstetrical perineal tears.

Concluding message

Knowledge of the perineal sagittal topographic anatomy facilitates the recognition of the structures while repairing obstetrical tears in the delivery room as well as the late sequelae of such tears.

References

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HUMAN SUBJECTS: This study was approved by the Research Ethics Committee of the Southern Swedish Region and followed the Declaration of Helsinki Informed consent was obtained from the patients.