

TWO-DIMENSIONAL ULTRASOUND IMAGING OF THE POSTERIOR VAGINAL WALL DESCENT

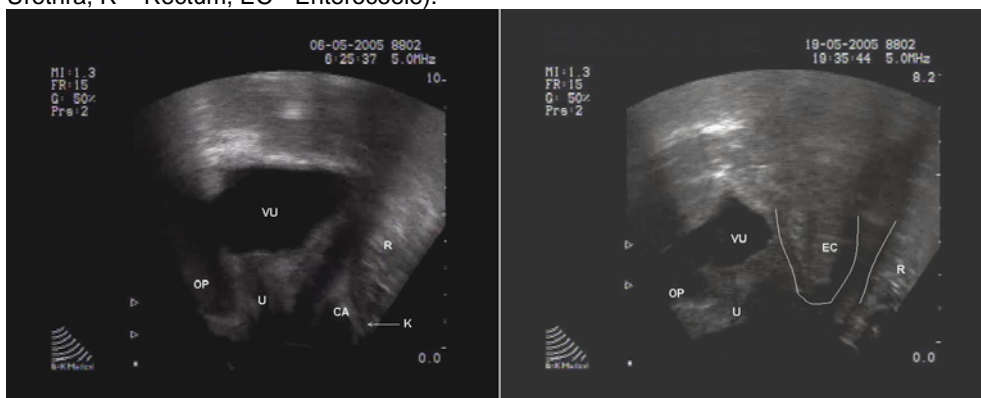
Hypothesis / aims of study

The aim of this pilot study is to contribute to the imaging of the posterior vaginal wall descent. Our study discusses the possibilities of the ultrasound imaging of the posterior compartment of the female pelvic floor, including the imaging of its defects. This study also tried to create the objective parameters to measure these defects in the same manner as it works in case of the anterior compartment defects.

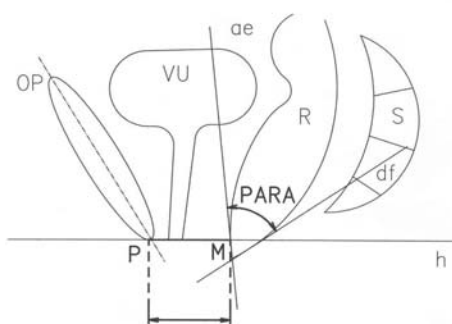
Study design, materials and methods

The study was approved by the local Ethics Committee and the informed consent was obtained. We did not receive any external funding of our study or grants. To improve visualisation of the examined area we applied ultrasound jelly into the rectum of each patient. The application of the jelly significantly improved visualising the image parameters (Picture 1 – left side) (OP – Pubic bone, VU – Urinary bladder, U – Urethra, CA – Anal Canal, R – Rectum, K - Catheter). The next task was what to assess and how to relate the measurements to an acceptable standard. We were limited by the perineal approach. It is possible to assess the distal part of the anterior wall of the rectum and the potential descent of it when imaging the posterior compartment.

Our study included 39 participants: 19 had clinically significant descent of the posterior vaginal wall and 20 were healthy controls. This study was approved by the local Ethic committee. Examination was performed in accordance with the latest recommendations on urogynaecologic ultrasound imaging. All participants underwent detailed clinical examination with the staging of the pelvic organ prolapse according to the POP-Q scale system as well as the urodynamic study in accordance with the standard of ICS (International Continence Society). We applied 30 ml of ultrasound jelly into the rectum of each participant. The urinary bladder was filled with 50 ml of saline solution before imaging to prevent tamponade of the rectocele by the concomitant cystocele. Measurement was performed at resting and during the Valsalva manoeuvre, first without the application of the contrast jelly and then after its application. The lower edge of the pubic bone and the horizontal placed through it were used as reference points. Sonoanatomy of the posterior compartment was assessed in relation to these reference points. The following parameters were determined: the lower edge of the pubic bone was labelled as point P; and the point of the cross of the anterior rectal wall and the horizontal was labelled point M, or M' during the Valsalva manoeuvre. The Posterior Anorectal Angle (PARA) was chosen as the next parameter. Axis of the anal canal is demonstrated with the abscissa *ae* on the scheme while tangent of the posterior rectal wall is defined as abscissa *df* (Picture 2) (OP – Pubic bone, VU – Urinary bladder, R – Rectum, S – Sacral bone). Its visualisation on ultrasound image was allowed because of the insertion of part of the thin urinary catheter filled with ultrasound jelly into the rectum. Measurement was performed at resting and during the Valsalva manoeuvre (Picture 1 – right side) (OP – Pubic bone, VU – Urinary bladder, U – Urethra, R – Rectum, EC - Enterocolle).



Picture 1



Picture 2

Results

The results are given in following table.

| Parameter | Group | n | Mean | Standard deviation | Standard error |
|----------------------------|---------|----|--------|--------------------|----------------|
| PM at resting | Control | 20 | 43.05 | 3.086 | .690 |
| | Patient | 19 | 24.95 | 2.345 | .538 |
| PM at Valsalva manoeuvre | Control | 20 | 37.35 | 2.254 | .504 |
| | Patient | 19 | 16.89 | 3.125 | .717 |
| PARA at resting | Control | 20 | 95.95 | 16.516 | 3.693 |
| | Patient | 19 | 104.32 | 6.037 | 1.385 |
| PARA at Valsalva manoeuvre | Control | 20 | 110.05 | 17.267 | 3.861 |
| | Patient | 19 | 130.26 | 7.694 | 1.765 |

Interpretation of results

We proved the statistically significantly higher increase in the distances PM and PM' in the group of patients; same results were obtained in values of PARA. These results were reproducible only when contrast ultrasound jelly was used.

Concluding message

We tried to find parameters for objective assessment of the descent of the posterior vaginal wall analogically to the parameters that are used to assess the defects of the anterior compartment. Our findings support this theory.

FUNDING: NONE

DISCLOSURES: NONE

HUMAN SUBJECTS: This study was approved by the The Local Ethics Committee, Teaching Hospital Bulovka, Prague and followed the Declaration of Helsinki Informed consent was obtained from the patients.