



## Abstract Reproduction Form B-1

W.Umek, A.Kratochwil, A.Obermair, D.Stutterecker, E.Hanzal

Department of Gynecology, University of Vienna, Austria

### 3 DIMENSIONAL ULTRASOUND OF THE FEMALE URETHRA COMPARING TRANSVAGINAL AND TRANSRECTAL SCANNING

#### Aims of the Study

3D Ultrasound (3D US) allows the scanning, depiction and measurement of tissue volumes. Perineal, introital and vaginal 3D-scans have been used to study the lower urinary tract (1,2,3). It has been suggested that 3D US could overcome some disadvantages of 2D US, like distortion of anatomy on vaginal scans (1) or artifacts along the urethral axis on perineal scans (2). This study was undertaken to compare the vaginal and the rectal approach of 3D ultrasound for the visualization of the female urethra.

#### Methods

We examined 30 patients in the supine position with a 3D US probe designed for transrectal visualization of the male prostate (7,5 MHz, B-mode angle 360 degree perpendicular to the transducer axis) on a Combison 530D (Kretztechnik, Austria). The probe was applied both vaginally and transrectally. Delineation of the urethra in the sagittal plane ensured that it could be seen in full length. Volume data sets were obtained by automatic rotation of the scanning head through a maximum angle of 140 degrees. The average scanning time using highest resolution and maximal line density was 10 seconds. All data were recorded on Magnetical Optical Discs for later evaluation. The size of one representative volume containing urethra, periurethral tissue and bladderneck was about 10 Megabyte. The following measures were taken on vaginal and rectal scans: urethral length, rhabdosphincter length, maximum rhabdosphincter thickness, maximum smooth muscle thickness, rhabdosphincter volume. Rhabdosphincter volumes were measured by tracing the outer delineation of the urethra and its smooth muscle on 6-8 tranverse sections. The rhabdosphincter volume was then calculated by subtracting the volume of smooth muscle and urothelium.

#### Results

Both vaginal and rectal scans could be obtained in all patients. The measures for rhabdosphincter length, maximum rhabdosphincter thickness, maximum smooth muscle thickness and rhabdosphincter volume did not differ between the two methods. Both applications were tolerated well. Rectal scans appeared to cause less distortion of the urethral anatomy and accounted for generally better image quality but could be seriously impeded by faeces.

#### Conclusion

3D ultrasound is an appropriate method to evaluate anatomy and morphology of the female urethra. The transrectal approach shows higher image quality and less artifacts.

#### References

- (1) Neurourol. Urodyn. (1994) 13;352
- (2) Int. Urogyn. J. (1995) 6;239f
- (3) Int. Urogyn. J. (1994) 5;319f