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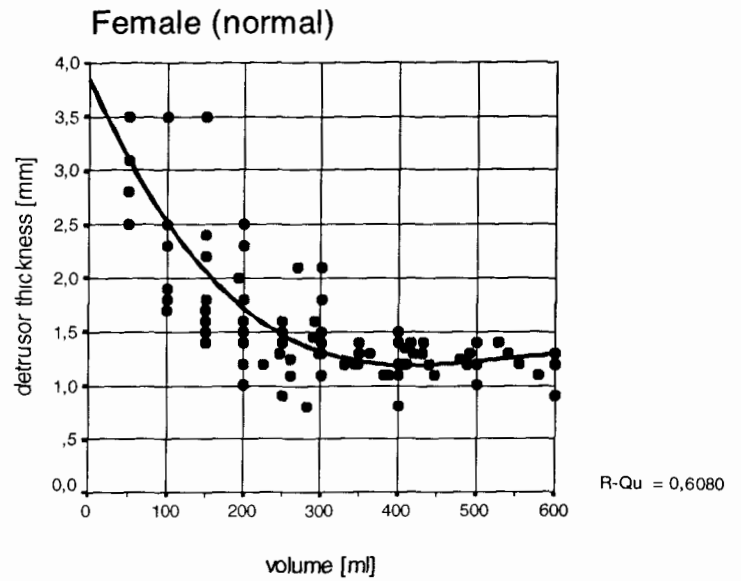
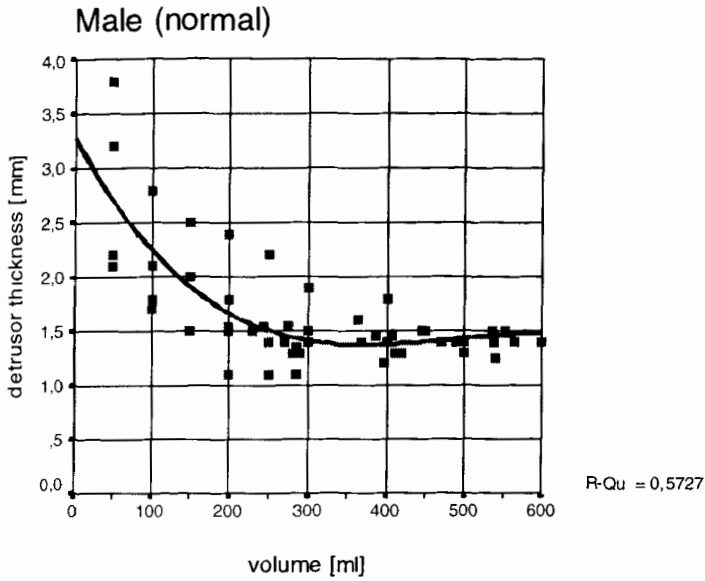
STANDARDISATION OF SONOGRAPHIC DETRUSOR WALL MEASUREMENT

Aims of the study: It is well known that detrusor wall thickness decreases with increasing bladder filling. Only a few articles deal with the sonographic evaluation of detrusor wall thickness using a singular filling volume only. The change of detrusor wall thickness in relation to different filling volumes of the bladder remains unknown. The aim of the study was to determine the detrusor wall thickness in relation to the bladder filling, gender, age, body weight and height in healthy adult volunteers.

Methods: Sonographic measurement of the detrusor was performed at the anterior bladder wall with a 7.5 MHz linear array (SonoDIAGNOST 360™, Philips) positioned suprapubically. The digital picture was enlarged to factor 9.8, and the detrusor wall was measured afterwards with the integral equipment of the ultrasound system. In 14 healthy adult persons (10 women, 4 men) detrusor wall thickness was measured every 50 ml up to a filling volume of 300 ml and every 100 ml up to the maximum filling volume. Furthermore, in 55 healthy adult volunteers (30 women, 25 men) between 14 and 40 years of age the detrusor wall was measured at maximum bladder filling only. The data of the detrusor wall thickness, age, gender, body weight and height was evaluated statistically by regression analysis, T-Test and ANOVA-Test.

Results: During the first 300 ml of the bladder filling (or 50% of the bladder capacity) the detrusor wall thickness decreases continuously, but thereafter remains constant up to the maximum bladder filling. The characteristic of the detrusor wall is similar in both men and women, but the detrusor thickness in men is greater in the 50-100% range of bladder filling (figure). Therefore, the detrusor wall thickness of the 55 healthy volunteers measured only at maximum bladder filling was greater in men (mean 1.42 ± 0.11 mm.) than in women (mean 1.26 ± 0.12 mm.). The difference varied significantly ($p < 0.01$). There was no correlation between detrusor wall thickness and age, body weight as well as height ($p > 0.05$).

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Conclusions: In healthy adults, the detrusor wall thickness is dependent on gender, and between 0 to 300 ml bladder filling also dependent on the bladder volume. Above 300 ml bladder volume (or >50% of the bladder capacity) the detrusor wall thickness remains constant. Therefore, measurements of detrusor wall thickness in patients with lower urinary tract disorders have to be evaluated separately in males and females. A comparison between adults with normal bladder function and those with bladder disorders is only possible with a bladder filling of more than 300 ml.