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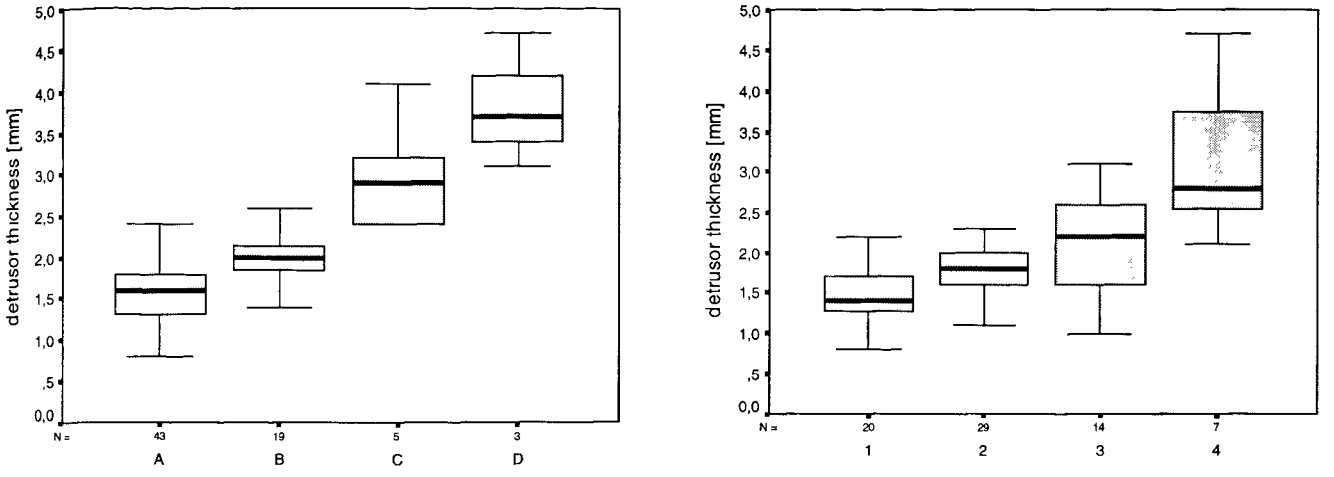
EVALUATION OF DETRUSOR WALL THICKNESS IN PATIENTS WITH SUBVESICAL OBSTRUCTION

Aims of the study: In patients with subvesical obstruction (e.g. benign prostatic hyperplasia), histological investigations of the bladder wall proved enlargement of the detrusor due to hypertrophy of smooth muscles cells and hyperplasia of connective tissue. Preliminary data revealed a correlation between sonographically determined bladder wall thickness and subvesical obstruction. The aim of this study was to determine detrusor wall thickness in patients with different grades of subvesical obstruction.

Methods: In 70 patients with LUTS and suspected subvesical obstruction, detrusor thicknesss was measured sonographically during urodynamic investigation. At maximum bladder filling, a 7.5 MHz linear array (SonoDIAGNOST 360™, Philips) was positioned suprapubically. After 9.8-fold enlargement of the digital picture, the detrusor thickness was measured at two different sites of the anterior bladder wall. The mean value of those 2 measurements was used for further evaluation. Immediately after the sonographic measurement, pressure-flow analysis was performed, and CHESS-classification was used to determine subvesical obstruction. Field A1 only was considered as non-obstruction, fields A2 and B1 as equivocal and all other fields varying grades of obstruction. The data of the sonographic measurement and the urodynamic investigation was calculated statistically by regression analysis, T-test and ANOVA-Test.

Results: In pressure-flow-analysis, 14 patients (20%) were non-obstructed, 23 patients (32.9%) were equivocal and 33 patients (47.1%) were obstructed. The mean detrusor thickness of the three groups was 1.32 mm (95%-CI: 1.17 - 1.48), 1.62 mm (95%-CI: 1.48 - 1.76) and 2 4 mm (95%-CI: 2.12 - 2.68), respectively. The mean detrusor thickness was varied significantly between the groups ($p<0.05$). With increasing CHESS-letter and increasing CHESS-number (figure) detrusor thickness increased in the same way ($p<0.01$). The maximum detrusor strength



(W_{max}) and the presence of inhibited detrusor contractions or urge-incontinence during cystometry showed no correlation with detrusor thickness ($p>0.05$).

Conclusions: A subvesical obstruction can be determined by sonographic measurement of detrusor wall thickness. With increasing subvesical obstruction the detrusor becomes thicker. However, detrusor thickness does not show any correlation with W_{max}, detrusor-hyperactivity or urge-incontinence. In order to use detrusor wall thickness instead of pressure-flow-analysis to clarify subvesical obstruction in adult patients with LUTS further investigations have to be carried out.