

Oral Presentation
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20.3. Urinary Tract

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Compensation and decompensation of the urinary bladder muscle studied non-invasively in 827 asymptomatic healthy males

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In the aging male, prostate enlargement often leads to urethral obstruction. In the early phase of obstruction, the increasing resistance of the urethra may be compensated by increasing contractility of the urinary bladder. Later the bladder may decompensate. To be able to apply (surgical) treatment before this irreversible damage occurs, we study the time course of changes in urethral resistance and bladder contractility. Hitherto such a longitudinal study was difficult to perform, as the measurement of bladder pressure was invasive (by insertion of catheters). We developed a non-invasive method of measuring the bladder pressure (Urology 63: 56-60 (2004)). Patients void through an incontinence condom into a flowmeter. The voiding is repeatedly mechanically interrupted, creating a pressure equilibrium between bladder and condom. This enables the isovolumetric bladder pressure to be measured in the condom. We measure this pressure, and also the maximum flowrate and prostate volume 3 times in 5 years in 827 asymptomatic males with rectangular age distribution between 38 and 77 years. Presently we analysed the data from the first evaluation round.

The age distribution of the prostate volumes is best described by stating that the range of the prostate volumes increased with age. Between the ages of 38 and 77, the 5th percentile of these volumes increased from 11 to 24 ml, whereas the 95th percentile increased from 43 to 83 ml. Conversely the 5th percentile of the maximum flowrates decreased from 8 to 5 ml/s, whereas the 95th percentile decreased from 43 to 30 ml/s. These two changes were significant according to analysis of variance ($p < 0.005$). The isovolumetric bladder pressure did not significantly depend on age ($p = 0.75$), it ranged from approximately 50 to 160 cm H₂O in all age groups. In this transverse analysis bladder compensation may have been obscured by age dependent bladder muscle degeneration, as observed in females (Neurourol.Urodyn.11-4: 315-317 (1992)). That will be tested in the follow up.

