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THE NATURAL HISTORY OF DETRUSOR CONTRACTILITY: MINIMUM 10-YEAR URODYNAMIC FOLLOW UP IN MEN WITH BLADDER OUTLET OBSTRUCTION AND THOSE WITH DETRUSOR UNDERACTIVITY

Hypothesis / aims of study

Detrusor function during voiding is classified by the International Continence Society (ICS 2002) into 3 categories: normal, underactive and acontractile. There is little in the literature as to what detrusor contractility change with time. This study aimed to assess the long-term effect, in male patients, of treated and untreated bladder outlet obstruction (BOO) on detrusor contractility and to explore the relationship between aging and detrusor underactivity (DUA).

Study design, materials and methods

Men investigated at our urodynamic department between 1972 and 1986 were traced and two groups were identified and invited for repeat pressure-flow urodynamic test. The first group included those aged over 40 with urodynamic diagnosis of bladder outlet obstruction at the initial assessment. Bladder outlet obstruction was defined as a bladder outlet obstruction index (BOOI= pdetQmax-2Qmax) greater than 40 (1). Only men over the age of 40 were included in this group due to the increasing likelihood of a diagnosis of benign prostatic obstruction with age. The other group of patients were those with detrusor underactivity defined by a bladder contractility index (BCI= pdetQmax+5Qmax) of less than a 100(1).
Standard pressure-flow studies (PFS) were repeated using the techniques that have remained unchanged in our department since 1972, so allowing direct comparison of results. Machine calibration, reference levels, quality control and trace interpretation were performed according to the recommendations of the International Continence Society (2).

Data handling and statistical analysis: Paired t-tests were used to test for differences between initial and follow up BCI. Results are presented in terms of a mean difference together with an associated 95% Confidence Interval (CI). If the test assumptions were found to be untenable, either the Wilcoxon signed ranks test or the sign test was used as appropriate. Analysis of covariance was used to test for differences between the BCI at follow-up assessment for the treated and untreated bladder outlet obstruction groups, adjusting for BCI at initial assessment.

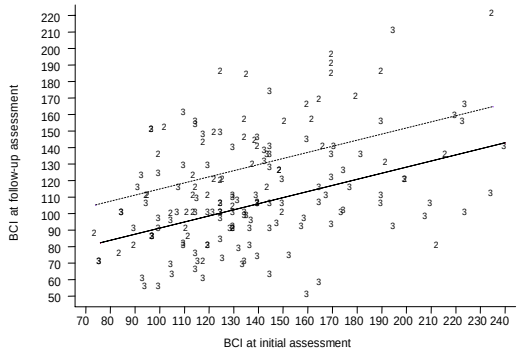
Results

196 patients (with a minimum 10 year gap from the first assessment) agreed to have repeat PFS: 56 patients with conservatively treated BOO, none of whom remained on long term drug therapy, 114 patients with BOO treated by transurethral resection of prostate (TURP) and 26 patients had detrusor underactivity.

Patients with BOO treated conservatively: Patients' ages ranged from 40 to 78 with a maximum of 22 year gap from the first assessment. The differences in BCI (follow up – initial) ranged from –132.5 to +60 with a median of –6 (IQR: -24 to 13, n=55). There was no difference in the BCI at follow up compared to the initial BCI (sign test, p=0.10, n=53).

Patients with BOO who underwent TURP treatment: Patient' s ages ranged between 40 and 78 with a maximum of 23 year from the initial PFS. There was no difference between the initial and follow up BCI with a mean difference (follow up – initial) = 0.01, 95% CI: -0.07 to 0.09, n=114.
Comparing the treated and untreated BOO patients, there was evidence to suggest a difference between the follow up BCI for the two groups, with follow up BCI tending to be higher for untreated patients (difference in BCI (untreated – treated) = 23.72, 95% CI: 14.44 to 33.01, n=168), Figure 1.

Detrusor underactivity group: the ages of patients in this group ranged from 26 to 66 years, with variable BCI at initial assessment (24-96) and a maximum follow up period of 22 years.



2=observation from untreated patients
3=observation from TURP patients

------ regression line for untreated patients
____ regression line for TURP patients

Fig 1.

There was no difference between the initial and follow up BCI (mean difference (follow up – initial) = 4.42, 95% CI: -3.40 to 12.25, n=26). None of the patients moved into the normal range of BCI (100 or more) during the follow up period. There was no evidence to suggest a relationship between length of follow-up and the difference in BCI (Spearman's rank correlation coefficient = 0.01, n=26), Figure 2.

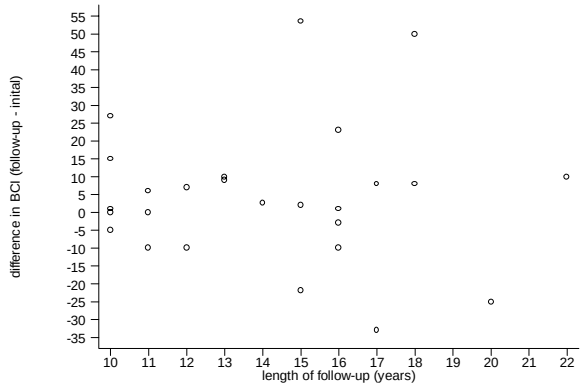


Fig2: Relationship between length of follow up and difference in BCI in DUA patients.

Fig2.

Interpretation of results

Patients with untreated BOO showed no significant deterioration of detrusor contractility with time and on the other hand we could not find any significant improvement in detrusor contractility in those treated by TURP. This could be confounded by the long gap between the operation and repeat urodynamic assessment or could be related to how long have these patients had their obstruction before they had their operation. Interestingly, we found that those treated by TURP, had a lower median BCI at the time of follow up, compared to the untreated patients, this is contrary to the detrusor contractility improvement after TURP shown by Porru et al (3). The most interesting results were those from detrusor underactivity patients with no BOO. There was no deterioration in detrusor contractility during the follow up period up to 22 years. It should be noted that these patients came from a wider age range than the BOO patients.

Concluding message

There is no evidence to suggest that detrusor contractility deteriorates with long-term bladder outlet obstruction. Relieving the obstruction surgically does not improve the contractility, which is important when considering and counselling for TURP operation. Underactive detrusors remains underactive but do not get worse with time which could indicate that it is not an aging process per se and may even have a congenital basis.

References

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