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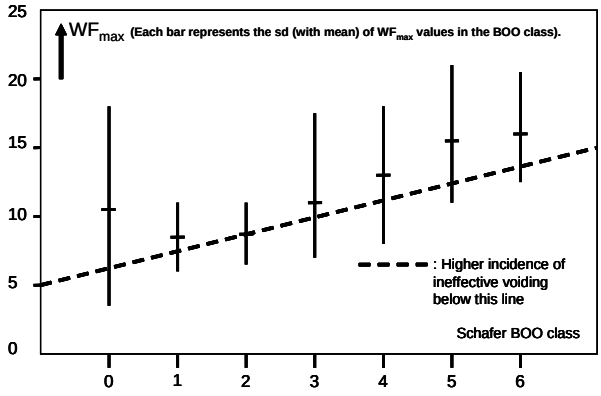
DETRUSOR CONTRACTION STRENGTH IN MALE PATIENTS BEFORE AND AFTER VARIOUS GRADES OF DESOBSTRUCTION.

Hypothesis / aims of study

The detrusor generates the power to empty the bladder. A normal detrusor tends to compensate for the (slowly increasing) grade of bladder outlet obstruction (BOO) in male when BPH develops. This was demonstrated with a representative sample of 242 symptomatic male patients with BPH. The maximum detrusor contraction power (as determined with the detrusor working function maximum: W_{max}) showed to be related with Schafer nomogram grade of BOO class.(1) In higher BOO classes, the average WF_{max} was higher and the patients with the relatively lowest WF_{max} in each class had lower voiding efficiency (void%). The results of this earlier study are shown in the figure:



How the detrusor voiding contraction or contractility 'responds' to *des*obstruction has never been studied. To add to the body of knowledge with regard to in vivo physiology and with regard to the clinical relevance of the diagnosis of detrusor contraction, detrusor contractility and detrusor contractile compensation or decompensation and also with regard to the clinical relevance of 'complete desobstruction' we have evaluated the changes of detrusor voiding contraction in a group of male patients before and after desobstruction on the basis of prospectively enrolled treatment protocols.

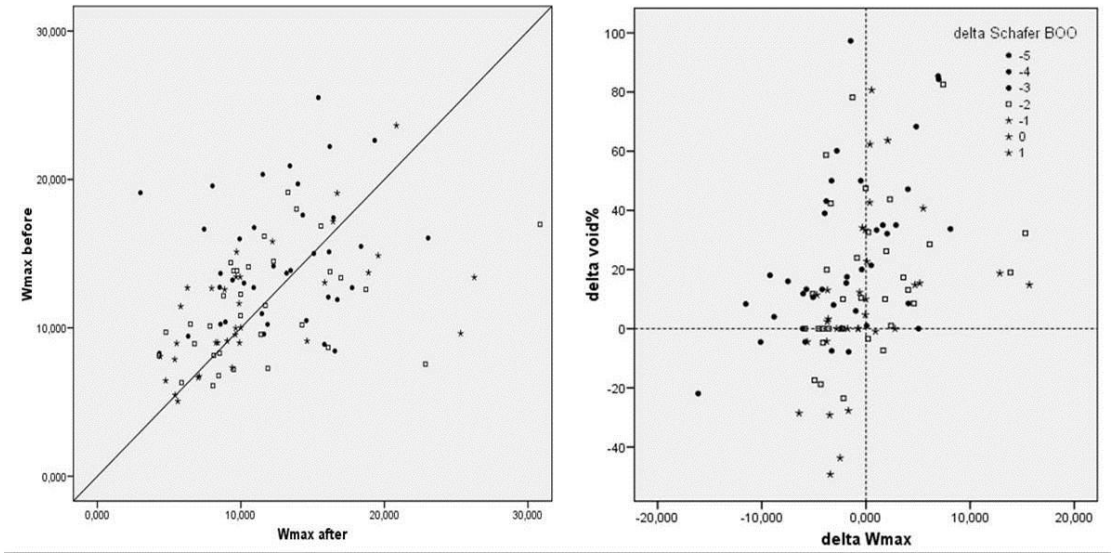
Study design, materials and methods

Urodynamic data of 148 symptomatic male patients that underwent desobstuction with contact laser prostatectomy (n=49), electrovaporisation prostatectomy (n=46) or 'classical' TURP (n=53) in various randomised prospective studies, with a standard post-treatment UDI after 6 months. The results of these studies have been published, but the studied TURP-alternatives are infrequently used and or modernized nowadays. The urodynamic data is however excellently applicable for the aim of this study because not all patients had a 'complete' desobstuction, which is the usual result of TURP. The dataset, thus including patients with *in*complete or 'partial' desobstruction gave a unique opportunity to study the relation between the grade of desobstruction and the detrusor voiding contraction in a human 'in vivo' model.

Results

Modal group reduction of BOO in all patients was 2 (Schafer) classes. Bladder outlet obstruction index (BOOI) reduced from 57 (± 26) to 7 (± 22) (paired t-test p: .000) and urethral resistance factor (URA) diminished from 39 (± 17) cmH_2O to 16 (± 9) cmH_2O (p: .000). Average WF_{max} was on average unchanged: 12.5 Wm^2 before and 11.8 Wm^2 after treatment (p: .145), and significantly correlated (r^2 .419 with p: .000).

In 37% of cases desobstruction has been > 2 BOO classes. In 31% of the patients the treatment resulted in a reduction of 2 BOO classes and in the remainder group BOO was reduced 1 BOO class (which is the average effect of apha –blocker pharmacotherapy) or an increase of 1 class or no change.



The graph on the left side shows before and after W_{max} per clustered BOO desobstruction ('delta Schafer BOO') grade and the right hand graph shows how desobstruction and detrusor contraction relate to void%.

Interpretation of results

In this group of patients W_{max} was almost identical before and after desobstruction (clustered around the X=Y reference line; left side graph), and without any relation with the grade desobstruction. Void% was improved (delta void%) in most patients (82%) after desobstuction (above dotted line in right hand graph). Patients with a negative delta void% (left lower quadrant of the right graph) showed a decline of W_{max}. Most of these patients had little (-1 class) or no (0 or +1 class) desobstruction.

Concluding message

What was known already is that the detrusor (more or less successful) compensates for BOO to maintain the ability to empty. What this study adds is that there is on average little change of detrusor voiding contraction ± 6 months after all 'grades of desobstruction'. It is also shown now that the improved voiding efficacy at that time, is related to the grade of desobstruction and to continuation of detrusor voiding contraction 'strength'. Urodynamic voiding efficiency improved in the majority of patients most consistently when BOO reduction was ≥2 (Schafer) grades. This study however, also indicates that incomplete or 'partial' desobstruction of BPH-BOO may be associated with decline of detrusor contraction power and increase of PVR on a proportion of patients.

References

1. J Urol. 1995 Dec;154(6):2137-42

Specify source of funding or grant	**Institutional Research**
Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
This study did not require ethics committee approval because	**The study is a retrospective chart review.**
Was the Declaration of Helsinki followed?	**No**
This study did not follow the Declaration of Helsinki in the sense that	**The study was a retrospective chart review**
Was informed consent obtained from the patients?	**No**