

## THE RELATIONSHIP OF LOW BLADDER COMPLIANCE AND INDICES OF BLADDER OUTLET OBSTRUCTION

### Hypothesis / aims of study

Bladder Compliance (BC) is an under-researched urodynamic parameter in the non-neuropathic population. Low BC has previously been shown to be associated with the diagnosis of Bladder Outlet Obstruction (BOO) in elderly men with urinary symptoms and furthermore BC decreases with advancing age, higher voiding pressures and the presence of detrusor overactivity in men undergoing prostatectomy (1). In addition histological changes in the bladder wall such as increased collagen content and greater detrusor mass have been reported in BOO (2). It seems that a change in the characteristics of the bladder in response to BOO will result in a less distensible organ, perhaps due to increases in the collagen/elastin ratio of the detrusor and this is exhibited by low BC at cystometry. The aim of this study was to assess the relationship of BC with other clinical and urodynamic parameters within a consecutive cohort of patients diagnosed with BOO following urodynamic studies (UDS).

### Study design, materials and methods

All patients given a urodynamic diagnosis of BOO over the preceding 24 months at our institution were included. The UDS were reviewed and all filling and voiding parameters were recorded. Correlation between the various urodynamic parameters and BC were sought. In addition the results from the BOO group were compared to a control group of the last 50 men with a normal UDS using Mann-Whitney, Pearson and Students t-tests.

### Results

A total of 211(99%) urodynamic studies were suitable for inclusion, 3 were of sub-optimal quality and excluded. As expected mean BC was significantly lower in the 161 men with BOO compared to the Normal group (122 vs 176 ml/cmH<sub>2</sub>O,  $p < 0.05$ ). Within the BOO group, poor correlation of BC was observed with age ( $r = 0.15$ ), maximum flow rate ( $r = 0.02$ ) and voiding pressure ( $r = 0.06$ ). The relationship of BC and Abrams-Griffiths number is shown in Figure 1. This reveals poor correlation between the severity of BOO and BC. 50(31%) of the obstructed patients were found to have low BC ( $\leq 40$  ml/cmH<sub>2</sub>O) and this group exhibited significantly lower maximum flow rates ( $p < 0.05$ ) and voided volumes ( $p < 0.05$ ). There was no difference in BC when men with BOO with or without DO were compared

### Interpretation of results

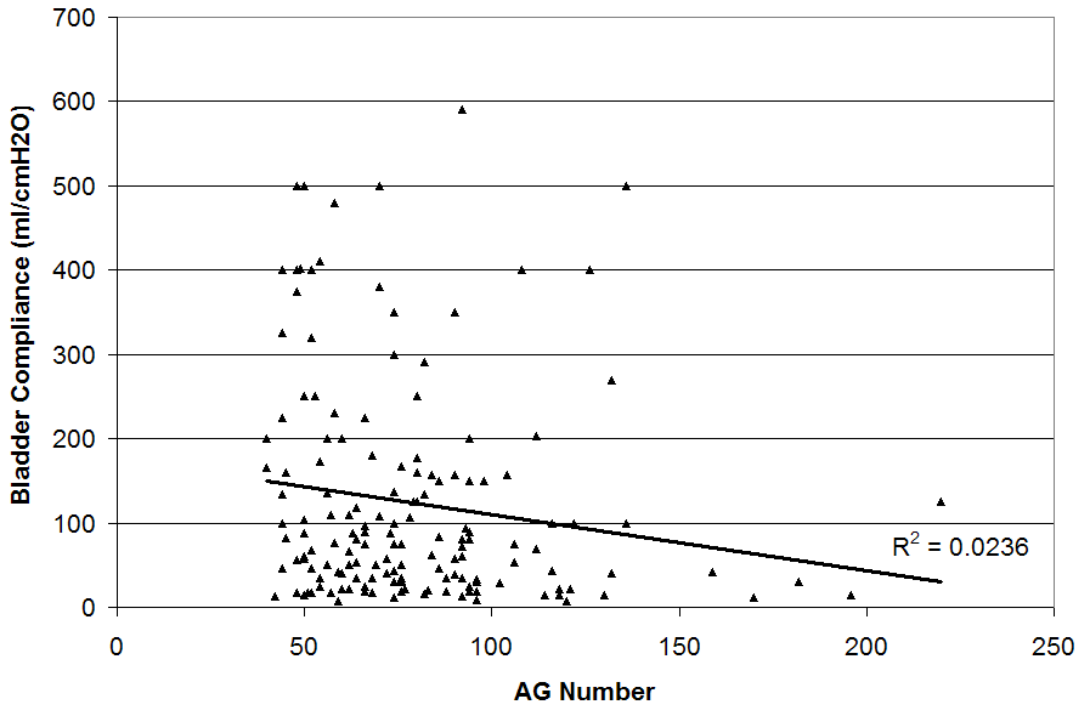
This study supports previous work suggesting a relationship between BOO and low BC. Although a general trend towards a reduction in BC with worsening BOO is observed the absolute correlation is poor. The finding of low BC appears to be associated with poor flow and reduced voided volume in this series rather than advancing age or the presence of overactivity. This may be a consequence of the previously reported morphological changes in the detrusor following BOO. It is logical that increases in the collagen content of the bladder wall (especially relative to other proteins such as elastin) may result in a reduction in the distensibility of the organ and a decrease in BC. It is not surprising therefore that lower voided volumes were observed in association with poor BC in this series. In addition the association of poor flow with low BC may be explainable by the histological changes such as increased collagen content resulting in a decrease in the contractile strength of the bladder due to a relative reduction in muscle. The increase in collagen/muscle ratio has previously been reported for men with BOO (3). Further work is needed to examine whether these observed urodynamic relationships are correlated with morphological changes in the bladder following obstruction.

### Concluding message

This study confirms an association between BOO and low BC and suggests an association between poor BC and decreased urine flow rate and voided volume. An explanation of these findings based on previously reported histopathological changes in the bladder wall is suggested.

### Figure 1

Relationship between bladder compliance and severity of bladder outlet obstruction in 161 uroynamically obstructed men



#### References

1. Ameda K et al. J Urol 1994;152:443
2. Elbadawi A et al. J Urol 1993;150:1681
3. Mauroy B. Eur Urol 1997;32:3

<b><i>Specify source of funding or grant</i></b>	<b>None</b>
<b><i>Is this a clinical trial?</i></b>	<b>No</b>
<b><i>What were the subjects in the study?</i></b>	<b>HUMAN</b>
<b><i>Was this study approved by an ethics committee?</i></b>	<b>No</b>
<b><i>This study did not require ethics committee approval because</i></b>	<b>It was a retrospective review</b>
<b><i>Was the Declaration of Helsinki followed?</i></b>	<b>Yes</b>
<b><i>Was informed consent obtained from the patients?</i></b>	<b>Yes</b>