

THE BLADDER SHAPE TEST 'BLAST' STUDY: A COMPOSITE MEASURE OF BLADDER SHAPE CHANGES

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Background

Over 50% of women with overactive bladder (OAB) symptoms do not demonstrate detrusor overactivity at conventional urodynamics. We hypothesised we could utilise 2D ultrasound(USS) to identify bladder shape change and associated involuntary detrusor contractions during physiological bladder filling, offering a non-invasive modality for detecting involuntary detrusor activity.

Forty nine women with OAB symptoms underwent serial trans-abdominal USS during physiological filling to evaluate bladder shape changes indicative of involuntary detrusor contractions.

Methods

High quality images from the data set were selected and analysed by two independent reviewers to identify whether any shape change had occurred.

Characteristics of bladder shape change were identified during previous studies and a scoring system was devised. This included changes in ; 1.concavity : convexity, 2.bladder narrowing (height: width), 3.reduced area : perimeter ratio and 4.reduced angularity corners. These characteristics were scored on a numerical scale between 0-4 determine whether shape change had occurred. We suspected that shape change was multifactorial and therefore a composite score was calculated.

This composite approach may identify bladder contractions. A higher score indicating shape change and possible detrusor contraction, whereas a low score indicating an acontractile bladder.

Results

The composite score was used to categorise the degree of shape change with a score of 0= 'no change', 0-1 'minimal change', 1-2 'moderate change', 2-3 'large change' or 3-4 'very large change'.

Using these parameters, reviewer 1 identified 22% and 6 % of women with moderate and large shape change respectively, whilst reviewer 2 identified 29% and 10% of women with moderate and large shape change respectively.

Conclusion

We have been able to identify a number of measurable shape characteristics using 2D USS. These changes may be significant both independently and collectively. 3D ultrasound may provide a deeper understanding of bladder shape changes and enable automated analysis of these shape changes.

References:

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