

## ASSESSMENT OF ELASTICITY OF THE URETHRA FROM CYSTOURETHROSCOPIC VIDEO IMAGE.

### Hypothesis / aims of study

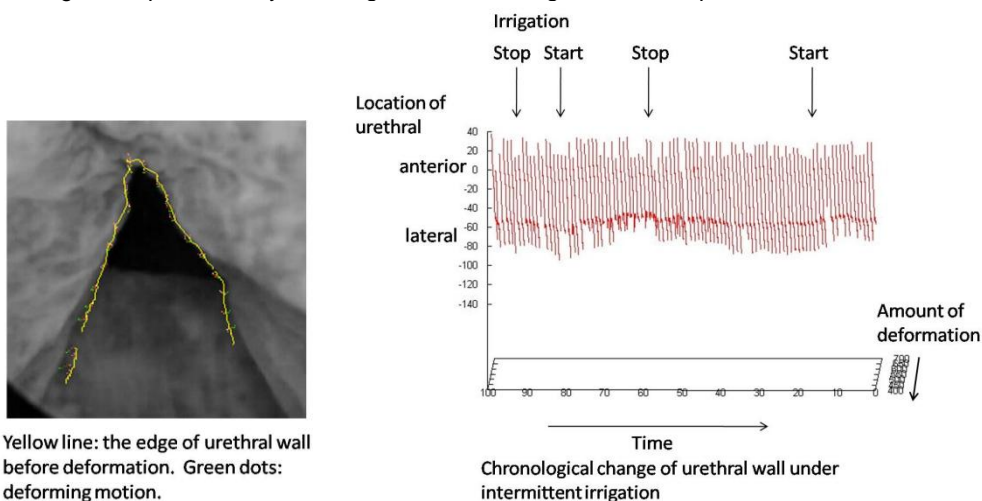
Elasticity of the urethra is considered to be one of factors related to continence mechanism and voiding function. Recent reports introduced various methods for estimate elasticity of the lower urinary tract using MR elastography [1], urethral pressure reflectometry or pressure profilometry [2]. Since cystourethroscopy is performed with irrigation, assessment of elasticity of urethral wall would be possible by detecting deformation of urethral wall under alteration of irrigation. We've already reported its feasibility to detect deformation of urethral wall from cystourethroscopic video image by processing intensity of pixels [3]. Here we introduce another method of detecting urethral deformation quantitatively.

### Study design, materials and methods

Between June 2009 and March 2010, cystourethroscopic video image was recorded in 5 patients scheduled for transurethral resection of the prostate and a patient scheduled for transurethral removal of the impacted urethral stone during the procedure. The video image was recorded under intermittent irrigation of isotonic water with water pressure set at 80 cmH<sub>2</sub>O using rigid cystourethroscopy fixed in an adequate position. The video image was captured to Widows based PC and was processed using algorithm designed to detect edge of the urethral wall in every frame and depict 3D graph that correspond to deformation of the urethral wall.

### Results

Depiction of the urethral edge and 3D graph was successful in 3 patients showing protruded prostate (figure). In the 3D graph, deformation of the urethral wall is depicted in accordance to water pressure. However, it was not successful in 2 patients showing interrupted view by bleeding or severe enlargement of the prostate that disturbed adequate irrigation.



Yellow line: the edge of urethral wall before deformation. Green dots: deforming motion.

### Interpretation of results

The deformation under intermittent irrigation is considered to indicate elasticity of the urethral wall. Since the amount of deformation is different according to the part of the urethra, the method will show 3D map of intraluminal shape and distribution of elasticity of the urethra.

### Concluding message

Assessment of elasticity of the urethral wall is feasible using cystourethroscopy and PC in patients with BOO using only a few seconds of video information. Further study is warranted to apply this method to the female urethra.

### References

1. Chopra R, et al. Magn Reson Med. 62:665-71, 2009.
2. Klarskov N, Lose G. Neurourol Urodyn. 27:807-12, 2008.
3. Igarashi T, et al. J Mechanics Med Biol. 9: 609-20, 2009.

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Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	Ethics Committee of Chiba University Hospital
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	Yes