

## MORPHOLOGIC VARIATION REFLECTED BY THE RATIO OF PROSTATE VOLUME TO PROSTATIC URETHRAL LENGTH AS A PREDICTOR OF MALE LUTS

### Hypothesis / aims of study

Though enlargement of the prostate had long been designated as a dominant etiology of low urinary tract symptom (LUTS), it is also well known that the size of the prostate does not correlate with the degree of obstruction, implying another cause of LUTS. As an attempt to identify missing link in development of LUTS, we hypothesized individualized morphologic variation of the prostate which was reflected by ratio of prostate volume to prostatic urethral length (RPL: ratio prostatic urethral length) as a potential predictor of LUTS, and investigated its clinical implication.

### Study design, materials and methods

From September 2012 to August 2013, 213 patients underwent transrectal ultrasonography on prostate mainly for the purpose of prostate biopsy by single experienced radiologist, and prostatic urethral length obtained by tracing the route of urethra which runs within the apex to base of the prostate. The degree of LUTS was investigated subjectively by international prostate symptom score (IPSS) and objectively by uroflowmetry. Along with total IPSS, divided score into obstructive symptom (IPSS 1356), and irritative symptom (IPSS 247) were also utilized as a clinical indicator, then correlations between variables were analyzed.

### Results

The mean ( $\pm$  standard deviation) age, prostate volume, and serum PSA was 65.2 $\pm$ 8.9 years old, 31.9 $\pm$ 18.6 g, and 4.91 $\pm$ 8.16 ug/dL, respectively. The mean prostatic urethral length and the RPL was 4.65 $\pm$ 0.86 cm and 5.10 $\pm$ 2.54 cm<sup>3</sup>/cm. In simple correlation with total IPSS, the subjective LUTS, no variables including age, prostate volume, prostatic urethral length, and RPL were significantly linked. In contrast, obstructive symptom was negatively ( $r=-0.3$ ,  $p<0.001$ ) and irritative symptom was positively associated with RPL ( $r=0.186$ ,  $p=0.007$ ). Particularly in patient with larger prostate (over 30cm<sup>3</sup>,  $n=93$ ), the links between each symptom and RPL was rather enhanced ( $r=-0.471$  [ $p<0.001$ ] and 0.3 [ $p=0.004$ ], respectively). IPSS questionnaire for quality of life had also related only with RPL, particularly in large prostate ( $r=0.331$  [ $p=0.001$ ]). However, these significant relevancies were disappeared in patient with relatively smaller prostate (below 30cm<sup>3</sup>,  $n=120$ , ( $r=-0.133$  [ $p=0.143$ ] and 0.75 [ $p=0.410$ ], respectively). In the severity of objective LUTS which was measured by uroflowmetry, peak flow rate was associated with age ( $r=-0.188$  [ $p=0.007$ ]) and prostate volume ( $r=0.185$  [ $p=0.007$ ]).

### Interpretation of results

Prostate urethral length was positively ( $r=0.319$  [ $p<0.001$ ]), and RPL was negatively ( $r=-0.195$  [ $p=0.004$ ]) correlated with post voiding residual urine amount, but these relationships were also banished in patient with smaller prostate.

### Concluding message

The subjective LUTS which was measured by symptom questionnaires had a significant correlation with morphologic features of the prostate which reflected by RPL, with toward to increased prostatic urethral length in obstructive symptom and decreased prostatic urethral length in irritative symptom, particularly in large prostate over 30g.

### Disclosures

**Funding:** No funding or grant **Clinical Trial:** Yes **Public Registry:** No **RCT:** No **Subjects:** HUMAN **Ethics not Req'd:** this study is retrospective study and no harm to patients. **Helsinki:** Yes **Informed Consent:** Yes