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Sengoku A[1], Nomi M[1], Yanagiuchi A[2]
1. *Hyogo Rehabilitation Center Hospital, Dept. of Urology,* ***2.*** *Hyogo Rehabilitation Nishi-Harima Hospital, Dept. of Urology*

FEMALE BLADDER OUTLET OBSTRUCTION WITH INTRAVESICAL BLADDER NECK PROTRUSION AND ITS ASSOCIATION WITH THE URETHRAL WALL THICKNESS

Hypothesis / aims of study

To examine an association between a severity of bladder outlet obstruction (BOO) and urethral wall thickness in female BOO patients with intravesical bladder neck protrusion.

Study design, materials and methods

A retrospective cohort study in a single center. Among consecutive female patients who visited our clinic with lower urinary tract symptoms (LUTS) suggestive of BOO and underwent video-urodynamic studies (VUDS), a total of 10 cases aged 39 and 83 (mean age: 66.3 ± 11.8) were enrolled according to the following criteria: intravesical bladder neck protrusion is seen during the storage phase in cystography, obstructive site is found between bladder neck and mid-urethra during the voiding phase in VUDS, BOO index (BOOI) is more than 40 or detrusor opening pressure (Pdet open) is more than 50 cmH2O in pressure-flow study, they have no organic conditions such as urethral stricture or cystocele, and they have no neurological disorders or disorders that possibly cause them (FBI cases). Urethral wall thickness was measured at the mid-urethral anterior wall in a sagittal image of trans-vaginal ultrasonography (TVUS) and/or with an anteroposterior diameter of the mid-urethral anterior and posterior wall in a sagittal T2 weighted image of magnetic resonance imaging (MRI), and a correlation between BOO severity and the urethral wall thickness was assessed together with control cases without BOO in UDS, which were allocated by 6 cases in TVUS (mean age: 76.3, ranged 69 to 81) and in MRI (mean age: 70.3, ranged 54 to 80).

Results

In FBI cases, mean values of BOOI and Pdet open were 58.1 ± 17.1 (ranged 38 to 93) and 75.3 ± 25.3 cmH2O (50 to 126 cmH2O), respectively. Electromyogram findings of the urethral sphincter using needle electrodes were synergic in 9 cases, and relaxing failure resulting from straining in one case. The obstructive sites during voiding phase were not constant and changeable according to the load of pressure to the urethra in each case. In TVUS among 10 FBI and 6 control cases, mean values of the mid-urethral anterior wall thickness were 8.8 ± 2.0 mm (6.2 to 12.1 mm) and 5.6 ± 1.5 mm (4.2 to 8.3 mm), respectively ($p = 0.0043$). Their correlations with BOO parameters were significant with a standard regression coefficient (r) of 0.849 in BOOI ($p < 0.0001$) and 0.813 in Pdet open ($p < 0.0002$) (Fig. 1). In MRI among 7 FBI and 6 control cases, mean values of an anteroposterior diameter of the mid-urethral wall were 16.7 ± 0.9 mm (15.2 to 18.1 mm) and 13.0 ± 0.8 mm (11.8 to 14.0 mm), respectively ($p < 0.0001$). They were significantly correlated with BOOI ($r = 0.934$, $p < 0.0001$) and Pdet open ($r = 0.949$, $p < 0.0001$) (Fig. 2).

Interpretation of results

A strong correlation was shown between BOO severity and the urethral wall thickness among FBI and control cases.

Concluding message

Together with changeability in the obstructive site in VUDS and synergic findings of the urethral sphincter in electromyogram, it was suggested that a mass effect due to the urethral wall thickening could strongly take part in the obstructive mechanism in FBI cases.

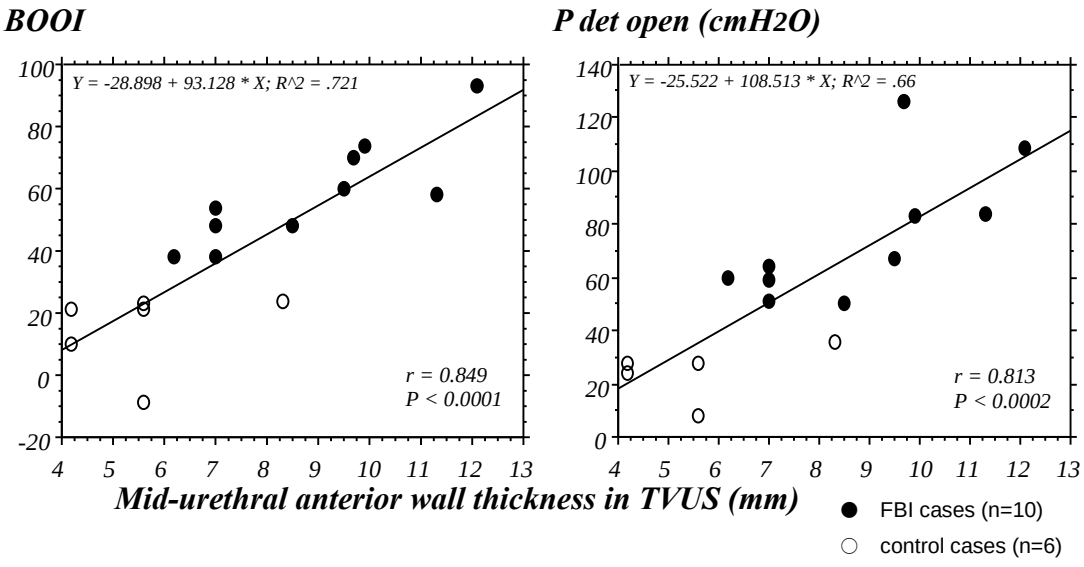

Fig. 1 Correlation between BOO parameters and the mid-urethral anterior wall thickness in TVUS

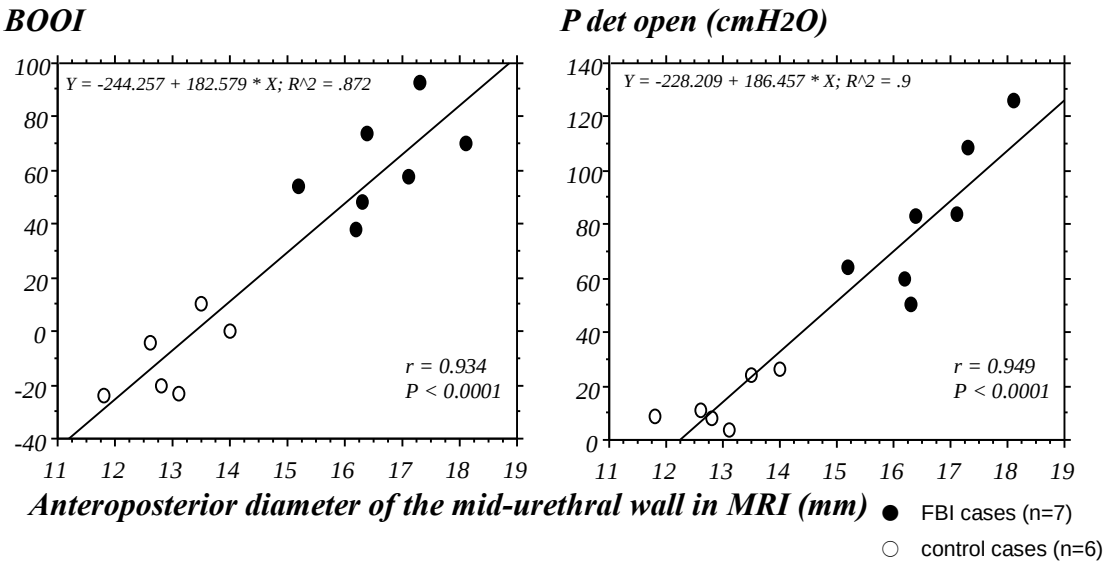

Fig. 2 Correlation between BOO parameters and anteroposterior diameters of the mid-urethral wall in MRI

Disclosures
Funding: None declared. **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** this is a retrospective cohort study within a range of usual clinical practice, and there are no violations of privacy. **Helsinki:** Yes **Informed Consent:** Yes