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# DIAGNOSIS OF CYSTOCELE TYPE BY POP-Q AND PELVIC FLOOR ULTRASOUND

Hypothesis / aims of study

The traditional radiological classification of cystoceles, originally proposed by Green (1), is based on bladder neck descent, retrovesical angle (RVA), and urethral rotation. Cysto-urethrography and pelvic floor ultrasound (US) can distinguish between two main types of cystocele, i.e., cystourethrocele (Green type II) and cystocele with intact RVA (Green type III). These two types of cystocele may have different aetiologies and functional implications. Cystocele type III is more likely to be associated with levator trauma than cystourethrocele (Type II), and the latter is more commonly found in patients with stress incontinence and an intact levator(2). On physical examination this distinction is universally ignored. The aim of this study is to use the ICS POP-Q examination to determine type of cystocele and compare findings with pelvic floor US results.

Study design, materials and methods

We enrolled 94 patients who were referred for Urodynamic testing between June and September 2009. All patients underwent a structured interview, physical examination using the ICS POP-Q, 4D pelvic floor US, and multichannel urodynamic testing. The ICS POP-Q examination was performed on maximal Valsalva for each patient by both first and second author; blinded against each other. Cystourethrocele (Cystocele type II) was diagnosed if point Aa was at the same position as point Ba, implying that there was no anterior vaginal wall groove, indicating an open retrovesical angle. Cystocele type III was diagnosed if point Aa was higher than point Ba, and a groove was found between the two, indicating an intact retrovesical angle.
Pelvic floor ultrasound was performed after the clinical examination using a GE Voluson 730 Expert system with 8-4 MHz volume transducer. A significant cystocele was diagnosed on US if any part of the bladder reached $\geq$ 10 mm below the symphysis pubis (3). There always was proximal urethral rotation of 45 degrees or more in such patients. A cystocele with open retrovesical angle (>=140°) was classified as Green II, one with intact angle (<140°) as Green III (see Figure 1). Statistical analysis was performed with SPSS v16. Cohen's Kappa was used to test for agreement between clinical observers on the one hand, and clinical and US findings on the other hand.

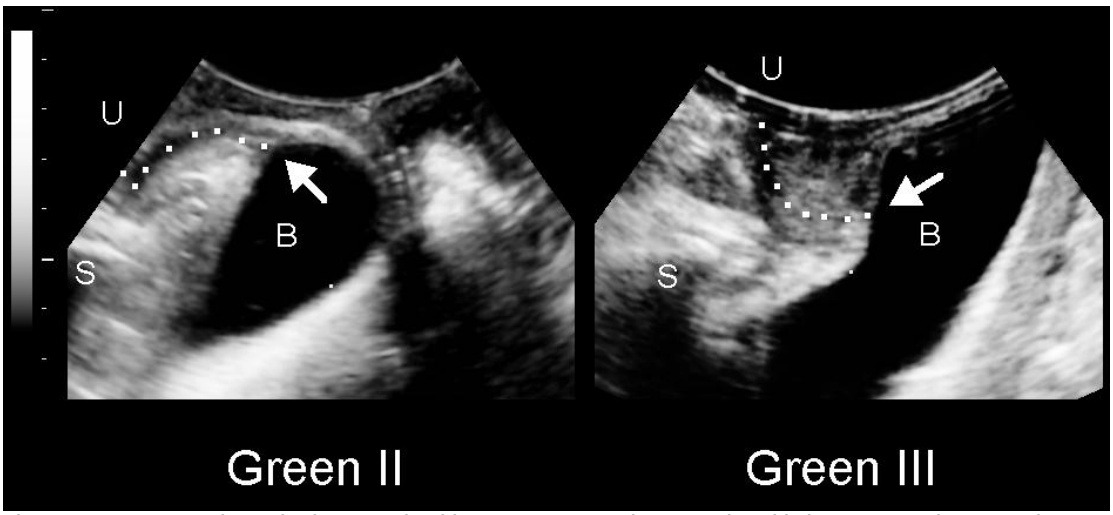


*Figure 1 : Cystourethrocele (Green II) with open RVA and cystocele with intact RVA (Green III). Arrows indicate the bladder neck, dots outline the urethra. It is evident that the configuration of bladder neck and urethra vary substantially between Green II and Green III cystoceles, even if the degree of bladder prolapse is similar.*

Results

Mean age was 57 (range 32-90 years). Median parity was 3 (range 0-10) with 85 out of 94 women vaginally parous. Mean BMI was 29.7 (range 19-50). Of 94 patients, 78 complained of stress incontinence, 78 of urge incontinence, 28 of frequency, 47 of nocturia, 22 of symptoms of voiding dysfunction, and 46 of symptoms of prolapse. Thirty-five women had had a hysterectomy, 21 anti-incontinence or prolapse surgery. Fifty-six patients had significant pelvic organ prolapse (ICS POP-Q stage $\geq$2). Multichannel urodynamics showed 67 patients with urodynamic stress incontinence, 30 with detrusor overactivity and 31 with urodynamic evidence of voiding dysfunction. A levator ani defect was diagnosed by tomographic ultrasound imaging in 23 patients. A unilateral defect was found in 11, and a bilateral defect in 12 women. On clinical examination by the first observer, a cystocele type II was found in 31 patients, a type III in 17. The second observer diagnosed a cystocele type II in 36 patients, and a type III in 18. On ultrasound, a cystocele type II was diagnosed in 21 patients, and a type III in 18.

For the diagnosis of cystocele type II by clinical examination, the agreement between observers showed a kappa of 0.561 indicating moderate agreement, while the agreement between clinical examination and PFUS showed kappas of 0.318 and 0.438 for the two observers. For the diagnosis of cystocele type III, the observers agreed moderately well (kappa 0.544), and agreement between clinical exam and US was moderate to good (k 0.794 and 0.544). All of the measured agreements reached significance with P values of < 0.001 to 0.01. (see Table1)

| | Cystocele Green type II | Cystocele Green type III |
|---|---|---|

| Agreement between | Kappa | Standard error | P | Kappa | Standard error | P |
|---|---|---|---|---|---|---|
| Observer 1 and Observer 2 | 0.561 | 0.089 | <0.001 | .0544 | 0.112 | <0.001 |
| Observer 1 and Ultrasound | 0.318 | 0.103 | 0.01 | 0.544 | 0.112 | <0.001 |
| Observer 2 and Ultrasound | 0.438 | 0.093 | <0.001 | 0.794 | 0.081 | <0.001 |

*Table 1 : Interobserver agreement for both types of cystocele and agreement between each observer and pelvic floor US for the diagnosis of cystocele type.*

Interpretation of results

The agreement between observers for the clinical diagnosis of radiological cystocele type according to the Green classification (cystourethrocele, Green II and cystocele with intact RVA, Green III) was moderate. Cystocele Green type III showed moderate to good agreement between both observers and diagnosis by pelvic floor ultrasound. Cystocele type II showed moderate agreement between observers and moderate agreement between the more senior observer and US. All of the comparisons reached significance.

Concluding message

Radiological cystocele type (Green classification) can be distinguished both clinically and on ultrasound, and agreement between methods as well as interobserver agreement for the clinical diagnosis is moderate to good. As those two types of cystocele have very different functional implications and may also have different aetiologies (2), further research into the clinical utility of this distinction is clearly indicated.

References

1. Am J Obstet Gynecol 1975;122:368-400
2. Int Urogynecol J 2009;20:S204-5
3. Ultrasound Obstet Gynecol 2007;29:688-91

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|---|---|
| ***Specify source of funding or grant*** | **N/A** |
| ***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*** | **SWAHS HREC** |
| ***Was the Declaration of Helsinki followed?*** | **Yes** |
| ***Was informed consent obtained from the patients?*** | **Yes** |