

CLINICAL STUDY

A new modification of the POPQ system – its effectiveness in the diagnosis of supravaginal elongation of the uterine cervix in cases with genital prolapse

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Abstract: *Background:* The evaluation of a genital prolapse has to include the POPQ-pelvic organ position quantification as a descriptive system.

Objectives: Effectiveness of our modification of the POPQ in the diagnosis of supravaginal cervical elongation.

Methods: We evaluated our modification: Ba1 (midpoint of distance Aa/Va); Vas (most proximal point of anterior vaginal wall); Va (attachment of anterior vaginal wall to cervix); Vp (attachment of posterior vaginal wall to cervix); Vps (most proximal point of posterior vaginal wall); SU (attachment of sacrouterine ligaments to cervix); Bp1 (midpoint of distance Ap/Vp); as well as some level distances: (Vas–Va), (Vp–SU), (Vps–Vp), (Aa–Ba1) in 358 patients, divided into: group A-stage I/II prolapse; group B-stage I/II prolapse and cervical elongation; group C-stage III/IV prolapse; group D-stage III/IV prolapse and cervical elongation; group E-stage 0 prolapse and stress incontinence during Valsalva maneuver (Vm) and Pozzy maneuver (Pm).

Results: In cases with a genital prolapse without cervical elongation, with presence of uterosacral ligaments/upper paracolpium deterioration, the points, such as: Ba1, Vas, Va, Vp, Vps, SU, D, Bp1 came down during Pm. In cases with cervical elongation, without upper paracolpium deterioration and strong uterosacral ligaments, points: SU, D, Bp1 were higher, and level distances: (Vas–Va), (Vp–SU), (Vps–Vp), (Aa–Ba1), (Ap–Bp) greater. In cases with stage 0 prolapse and USI, with only urethrovesical junction deterioration, we found a higher position of Vas, Va, Vp and SU, reflecting the absence of upper paracolpium deterioration.

Conclusion: Our modification seems to be effective in the diagnosis of cervical elongation (Tab. 4, Fig. 3, Ref. 6).

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Key words: pelvic organ prolapse, POPQ system.

Although a female pelvic organ prolapse is intimately related to the lower urinary tract function, an accurate communication using a standard terminology has not been possible because there has been no universally accepted system for describing the anatomic position of the pelvic organs. In 1993, an international committee composed of members of the ICS, the American Urogynecologic Society and the Society of Gynecologic Surgeon drafted the standardization document, which was formally adopted by the ICS in October 1995 (1). According to this document, the evaluation of the genital prolapse has to include the Description of pelvic organ prolapse. The clinical description of pelvic floor anatomy is done during the physical examination of the external genitalia and vaginal canal. It is critical that the examiner sees and describes the maximum protrusion noted. Suggested criteria for demonstration of maximum pro-

lapse should include all of the following: 1. any protrusion of the vaginal wall has become tight during straining by the patient; 2. traction on the prolapse causes further descent. The complete evaluation of patients with genital prolapse has to include the evaluation of a urinary incontinence with: a structured questionnaire for urinary symptoms with standardized terminology, based on the International Continence Society recommendation (2); complete multichannel urodynamic examination and Marshall's coughing test in upright position, and lithotomic position with an artificial cervix reposition for the detection of the potential stress incontinence (SI) after bladder filling with 300 ml 3 % of boric acid by transurethral catheter. The complete evaluation of a genital prolapse has to include the POPQ – pelvic organ position quantification (1), as a descriptive system that: 1. contains a series of component measurements listed separately, without being fused into a distinctive new expression or "grade"; 2. allows accurate site-specific observations of the stability or progression of prolapse over time by the same or different observers; 3. allows similar judgments regarding the outcome of surgical repair of prolapse. According to the POPQ system, the pelvic organ prolapse is evaluated by a clearly defined anatomic points of reference: 1. the hymen is the fixed point of reference

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used in this system. The term “hymen” is preferable to the ill-defined and imprecise term “introitus”. The plane of the hymen is defined as level zero; 2. the anatomic position of the points is expressed as centimeters above or proximal to the hymen (negative number) or centimeters below or distal to the hymen (positive number); 3. The defined points of the anterior vaginal wall are: point Aa, located in the midline of the anterior wall 3 cm proximal to the external urethral meatus, corresponding to the “urethrovesical crease”; point Ba, the most distal position of any part of the upper anterior vaginal wall from the vaginal fornix (vaginal cuff) to point Aa; 4. The defined points of the superior vagina are: point C, the most distal edge of the cervix or the leading edge of the vaginal cuff; point D, located of the posterior fornix (or pouch of Douglas); 5. The defined points of the posterior vaginal wall are: point Ap, located in the midline of the posterior vaginal wall 3 cm proximal to the hymen; point Bp, the most distal position of any part of the upper posterior vaginal wall from the vaginal cuff or posterior vaginal fornix to point Ap; 6. Other landmarks and measurements: gh (genital hiatus), measured from the middle of the external urethral meatus to the posterior midline hymen; pb (perineal body), measured from the posterior margin of the genital hiatus to the midanal opening; tvl (total vaginal length), the greatest depth of the vagina in centimeters, i.e. the distance between hymen and point D. Ordinal stages of genital prolapse: Stage 0-no prolapse, Aa, Ap, Ba, Bp are all at -3 cm, and point C or D is $\leq(tvl-2)$ cm; Stage 1 – the most distal portion is >1 cm above the hymen; Stage 2 – the most distal portion is ≤ 1 cm proximal to or distal to the hymen; Stage 3 – the most distal prolapse is >1 cm below the hymen, but protrudes no further than 2 cm less than tvl in cm; Stage 4 – the distal portion of the prolapse protrudes to at least $(tvl-2)$ cm.

Since January 2002, we have introduced a modified POPQ system in ordinary routine at our Department for urogynecology and pelvic floor disorders. The aim of this prospective observational study was to evaluate the effectiveness of this modification in the diagnosis of supravaginal cervical elongation in cases with genital prolapse.

Material and methods

Eligibility criteria for participants: a presence of genital prolapse (GP) or isolated urinary stress incontinence (USI) without coexisting uterine prolapse.

The setting, location and timing where and when the data were collected: the Department for Urogynecology and Pelvic Floor Disorders in the Clinic of Gynecology and Obstetrics, Medical Faculty of the “Saint Cyril and Methodius” University in Skopje in the period from the 1st of January 2004 to the 31st of December 2004. The study was designed according to the CONSORT statement (3).

Precise details of the interventions for each group, how and when they were actually administered: The experimental arm: All patients (n=358) were divided into 5 groups regarding the degree of the present genital prolapse during the maximal effort (Valsalva maneuver): 1. group Av (n=117) of patients with stage

I or II prolapse, but without cervical supravaginal elongation; 2. group Bv (n=50) of patients with stage I or II prolapse and coexisting cervical supravaginal elongation; group Cv (n=32) of patients with stage III or IV prolapse, but without cervical supravaginal elongation; 4. group Dv (n=51) of patients with stage III or IV prolapse and coexisting cervical supravaginal elongation; 5. group Ev (n=108) of patients with stage 0 prolapse and coexisting stress incontinence. The same patients (n=358) were divided into other 5 groups regarding the degree of the present genital prolapse during the maximal traction of the uterus with Pozzy clamp (Pozzy maneuver): 1. group Ap (n=117) of patients with stage I or II prolapse, but without cervical supravaginal elongation; 2. group Bp (n=59) of patients with stage I or II prolapse and coexisting cervical supravaginal elongation; group Cp (n=50) of patients with stage III or IV prolapse, but without cervical supravaginal elongation; 4. group Dp (n=79) of patients with stage III or IV prolapse and coexisting cervical supravaginal elongation; 5. group Ep (n=53) of patients with stage 0 prolapse and coexisting stress incontinence. The criterion for the cervical supravaginal elongation was the presence of distance between the point Vp and point SU equal or higher than 2 cm. All above mentioned groups were included into the Standard Urogynecological Protocol for Uterine Prolapse of our Department. The study was approved by the local research ethics committee (LREC) of the Macedonian Association of Gynecologists and Obstetricians.

How sample size was determined and the method used to generate the random allocation sequence, including details of any restriction: Every patient with present GP or USI which was admitted at our Department for Urogynecology in the above mentioned period was assessed for eligibility for this study (n=358). All these patients were evaluated and none of them was excluded from the study because they wanted to participate and be randomized, and none of them refused to undergo the evaluation.

Specific objectives and hypotheses: The purpose was to assess the effectiveness of our new modification of the POPQ system in the diagnosis of supravaginal cervical elongation in cases with genital prolapse. The hypothesis was: our new modification of the POPQ system could be very useful in the diagnosis of supravaginal cervical elongation in cases with genital prolapse, and that could be a crucial point in possible intra-operative difficulties during vaginal hysterectomy.

Clearly defined primary and secondary outcome measures, any methods used to enhance the quality of measurements: The complete evaluation for a genital prolapse included: a structured questionnaire with standardized terminology and pelvic organ prolapse quantification according to our modification of the POPQ system. All patients had pelvic examination performed in the supine position in a birthing chair while performing the Valsalva maneuver (Vm) with maximal effort and during Pozzi maneuver (Pm) with a pulling down of the cervix or vaginal cuff with Pozzi clamp, that allowed the full development of the prolapse. The bladder was empty by catheterization and rectum too, by morning defecation. The measurements were made with a

Tab. 1. Quantitative description of pelvic organ position with anatomic landmarks in patients with genital prolapse stage I or II without supravaginal cervical elongation (group A) and with supravaginal cervical elongation (group B).

POPQ stage	Valsalva maneuver		Pozzi maneuver		t ₁	t ₂
	Av group (1) (n=117)	Bv group (2) (n=50)	Ap group (3) (n=117)	Bp group (4) (n=59)		
Aa	-1.40±1.27	-1.33±0.76	-1.12±1.16	-0.73±1.22	0.05	0.14
Ba	-0.98±1.48	-0.48±0.99	-0.53±1.31	-0.92±1.18	0.28	0.22
Ba1	-3.82±0.99	-1.97±0.72	-2.61±1.27	-3.37±1.08	1.52	0.46
Vas	-5.30±2.77	-4.40±0.83	-4.97±1.18	-4.79±1.21	0.53	0.11
Va	-4.92±1.87	-3.42±1.16	-3.13±1.32	-1.86±1.35	0.68	0.67
C	-3.49±1.04	-2.16±1.33	-1.64±1.31	-0.58±1.20	0.57	0.59
Vp	-5.30±1.76	-4.24±1.22	-3.47±1.18	-2.73±1.08	0.50	0.46
SU	-6.40±1.90	-7.49±1.18	-4.80±1.29	-5.93±0.98	0.22	0.70
D	-7.69±1.23	-8.71±1.21	-5.27±1.26	-7.15±0.99	0.64	1.18
Vps	-7.10±1.51	-7.43±1.43	-6.06±1.16	-6.43±1.11	0.16	0.23
Bp1	-5.31±1.66	-6.49±1.17	-4.70±1.31	-5.62±1.18	0.58	0.52
Bp	-2.16±1.14	-2.37±1.08	-1.79±1.11	-2.09±1.11	0.13	0.18
Ap	-2.31±1.07	-2.63±1.09	-2.08±1.21	-2.63±1.30	0.21	0.31
Vas - Va	0.41±0.66	1.12±0.99	1.83±0.22	2.99±0.26	1.09	10.54‡
Vp - SU	1.11±0.76	3.33±0.43	1.32±0.23	3.25±0.09	2.55†	7.72‡
Vps - Vp	1.89±0.57	3.29±0.31	2.61±0.15	3.78±0.08	2.18*	6.88‡
Aa - Ba1	2.45±0.79	0.65±0.33	1.51±0.43	2.66±0.36	4.00‡	2.09*
Ap - Bp1	3.11±0.78	3.80±0.98	2.65±0.39	2.97±0.33	0.90	0.63

Student's paired test – (*) p<0.05; (†) p<0.025; (‡) p<0.01; (§) p<0.001
 Legend: POPQ – International Continence Society's Pelvic Organ Prolapse Quantification system

Aa – a point located in the midline of the anterior vaginal wall 3 cm proximal to the external urethral meatus; **Ba** – the most distal position of any part of the upper anterior wall from the vaginal cuff to point Aa; **Ba1** – the midpoint of the distance Aa/Va; **Vas** – the most proximal point of the anterior vaginal wall; **Va** – the attachment of the anterior vaginal wall to the cervix; **C** – leading edge of the cervix; **Vp** – the attachment of the posterior vaginal wall to the cervix; **Vps** – the most proximal point of the posterior vaginal wall; **SU** – the attachment of the sacrouterine ligaments to the proximal part of the cervix; **D** – the depth of the Douglas recession (distance between the hymen and the most distal point of the Douglas); **Bp1** – the midpoint of the distance Ap/Vp; **Bp** – the most distal position of any part of the upper posterior wall from the vaginal cuff to point Ap; **Ap** – a point located in the midline of the posterior vaginal wall 3 cm proximal to the hymen; **(Vas–Va)** – difference between the levels of point Vas and Va; **(Vap–SU)** – difference between the levels of point Vap and SU; **(Vps–Vp)** – difference between the levels of point Vps and Vp; **(Aa–Ba1)** – difference between the levels of point Aa and Ba1; **(Vp–SU)** point Vp and SU; point Aa and Ba1; point Ap and Bp1; **(Ap–Bp1)** – difference between the levels of point Ap and Bp1. **t₁** – differences between column 1 and 2; **t₂** – differences between column 3 and 4.

gradual uterine sound as auxiliary device, introduced along the examiner's finger till its top, which was placed at the particular defined landmark.

In our new modification of the POPQ system, which was used to evaluate our patients, we included some additional defined points, such as: Ba1 (midpoint of the distance Aa/Va); Vas (most proximal point of the anterior vaginal wall); Va (attachment of the anterior vaginal wall to the cervix); Vp (attachment of the posterior vaginal wall to the cervix); Vps (most proximal point of the posterior vaginal wall); SU (attachment of the sacrouterine ligaments to the uterine cervix); Bp1 (midpoint of the distance Ap/Vp); as well as some level distances between the points, such as: (Vas–Va), between point Vas and Va; (Vp–SU), between point Vp and SU; (Vps–Vp) between point Vps and

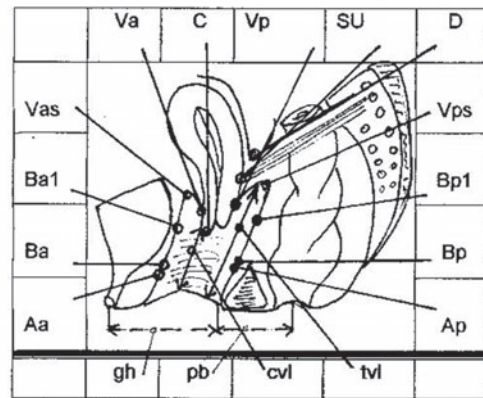


Fig. 1. Our modification of the International Continence Society's Pelvic Organ Prolapse Quantification (POPQ) system. Aa – a point located in the midline of the anterior vaginal wall 3 cm proximal to the external urethral meatus; **Ba** – the most distal position of any part of the upper anterior wall from the vaginal cuff to point Aa; **Ba1** – the midpoint of the distance Aa/Va; **Vas** – the most proximal point of the anterior vaginal wall; **Va** – the attachment of the anterior vaginal wall to the cervix; **C** – leading edge of the cervix; **Vp** – the attachment of the posterior vaginal wall to the cervix; **Vps** – the most proximal point of the posterior vaginal wall; **SU** – the attachment of the sacrouterine ligaments to the proximal part of the cervix; **D** – the depth of the Douglas recession (distance between the hymen and the most distal point of the Douglas); **Bp1** – the midpoint of the distance Ap/Vp; **Bp** – the most distal position of any part of the upper posterior wall from the vaginal cuff to point Ap; **Ap** – a point located in the midline of the posterior vaginal wall 3 cm proximal to the hymen; **gh** – genital hiatus; **pb** – perineal body; **cvl** – the distance between the hymen and the most distal point of the cervix; **tv** – total vaginal length (distance between the hymen and Vps).

Vp; **(Aa–Ba1)** between point Aa and Ba1; **(Ap–Bp1)** between point Ap and Bp1. We represent our modification in the Figure 1.

Statistical methods

The Student's paired test was used to compare the pelvic organ position with anatomic landmarks according to our modification of POPQ system between the groups.

Results

On the Table 1, the differences in a quantitative description of pelvic organ position in patients with genital prolapse stage I or II, with and without supravaginal cervical elongation during Vm (group Av and group Bv) or Pm (group Ap and Bp) are present. As we can see, the standard anatomic landmarks did not show significant differences. Nevertheless, some of our proposed new landmarks, such as level differences between: (Vas–Va); (Vp–SU); (Vps–Vp); (Aa–Ba1); showed significant differences between the groups, especially during Pm.

On the Table 2, where the same parameters are present, but in patients with a genital prolapse stage III or IV, with and without supravaginal cervical elongation during Vm (group Cv and Dv) or Pm (group Cp and Dp), almost the same situation can be

Tab. 2. Quantitative description of pelvic organ position with anatomic landmarks in patients with genital prolapse stage III or IV without supravaginal cervical elongation (group C) and with supravaginal cervical elongation (group D).

POPQ stage	Valsalva maneuver		Pozzi maneuver		t ₁	t ₂
	Cv group (1) (n=32)	Dv group (2) (n=51)	Cp group (3) (n=50)	Dp group (4) (n=79)		
Aa	-0.19±1.32	-0.39±1.47	+0.69±1.23	-0.16±1.32	0.10	0.47
Ba	+3.50±1.18	+1.01±1.21	+4.13±1.41	+3.54±1.11	1.47	0.34
Ba1	+0.38±1.23	+1.33±1.02	+1.41±1.13	+1.58±1.06	0.59	0.11
Vas	-2.78±1.27	-1.98±0.89	-1.90±1.67	-1.77±1.01	0.52	0.07
Va	+3.38±1.11	+2.93±1.13	+4.12±1.28	+3.59±1.15	0.28	0.31
C	+5.38±1.36	+4.91±1.21	+6.13±1.37	+5.68±1.31	0.26	0.24
Vp	+2.50±1.13	+0.53±1.16	+2.80±1.33	+0.89±1.62	1.22	0.91
SU	+1.78±1.42	-4.86±1.42	+1.12±1.21	-4.37±1.30	3.32‡	2.95§
D	-0.12±1.51	-6.96±1.29	-0.88±1.02	-6.41±1.18	3.45‡	3.54‡
Vps	-4.22±1.11	-6.53±1.36	-4.33±1.99	-4.78±1.21	1.32	0.19
Bp1	+1.44±1.72	-4.23±1.12	-2.03±1.81	-3.70±1.19	2.77 §	0.85
Bp	+2.94±1.66	+0.04±1.14	+2.38±1.63	+0.18±1.60	1.44	1.12
Ap	-1.81±1.51	-2.56±1.29	-2.16±1.14	-2.52±1.22	0.38	0.22
Vas - Va	6.25±0.78	3.98±0.71	6.12±0.48	5.30±1.09	2.16†	0.67
Vp - SU	0.75±0.46	5.25±0.79	1.60±0.86	5.27±0.88	4.95†	2.98§
Vps - Vp	6.70±0.61	7.12±0.80	7.10±0.63	5.65±0.48	0.42	3.37‡
Aa -Ba1	0.55±0.19	1.81±0.13	0.75±0.09	1.45±0.41	5.48‡	1.67
Ap - Bp1	3.30±0.18	1.66±0.26	0.11±0.08	1.19±0.13	5.12‡	7.20‡

Legend as in Table 1

Tab. 3. Quantitative description of pelvic organ position with anatomic landmarks in patients with genital prolapse stage I or II without supravaginal cervical elongation (group A) and patients with stage 0 prolapse and coexisting stress incontinence (group E).

POPQ stage	Valsalva maneuver		Pozzi maneuver		t ₁	t ₂
	Av group (1) (n=117)	Ev group (2) (n=108)	Ap group (3) (n=117)	Ep group (4) (n=53)		
Aa	-1.40±1.27	-1.75±0.98	-1.12±1.16	-1.56±1.28	0.22	0.26
Ba	-0.98±1.48	-1.69±1.04	-0.53±1.31	-1.52±1.30	0.39	0.54
Ba1	-3.82±0.99	-4.60±1.19	-2.61±1.27	-4.98±1.20	0.50	1.53
Vas	-5.30±2.77	-7.85±1.25	-4.97±1.18	-8.30±1.20	1.31	1.98*
Va	-4.92±1.87	-7.78±1.65	-3.13±1.32	-7.96±1.14	1.15	2.78§
C	-3.49±1.04	-7.18±1.48	-1.64±1.31	-7.77±1.19	2.04*	3.46‡
Vp	-5.30±1.76	-8.36±1.11	-3.47±1.18	-8.60±1.12	1.47	3.15 £
SU	-6.40±1.90	-9.31±0.93	-4.80±1.29	-9.37±1.20	1.38	2.60§
D	-7.69±1.23	-9.92±0.78	-5.27±1.26	-9.56±1.24	1.60	2.42†
Vps	-7.10±1.51	-8.87±0.86	-6.06±1.16	-9.04±1.23	0.85	1.76
Bp1	-5.31±1.66	-6.19±1.19	-4.70±1.31	-6.10±1.11	0.43	0.82
Bp	-2.16±1.14	-2.68±0.74	-1.79±1.11	-2.60±1.16	0.38	0.51
Ap	-2.31±1.07	-2.66±0.76	-2.08±1.21	-2.60±1.00	0.27	0.33
Vas - Va	0.41±0.66	0.15±0.33	1.83±0.22	0.33±0.36	0.33	3.57‡
Vp - SU	1.11±0.76	1.11±0.32	1.32±0.23	0.68±0.31	0.16	1.68
Vps - Vp	1.89±0.57	0.53±0.11	2.61±0.15	1.41±0.43	2.24†	4.89‡
Aa -Ba1	2.45±0.79	2.86±0.87	1.51±0.43	3.50±0.76	0.36	2.29†
Ap - Bp	3.11±0.78	3.52±0.89	2.65±0.39	3.55±0.83	0.42	2.57§

Legend as in Table 1

noticed. So, the standard anatomic landmarks did not show significant differences but the new proposed landmarks: SU, D, Bp1, (Vas–Va), (Vp–SU), (Vps–Vp), (Aa–Ba1), (Ap–Bp1) showed significant differences between the groups.

The comparison of the parameters in patients with genital prolapse stage I or II without supravaginal cervical elongation (group A) and patients with stage 0 prolapse and coexisting uri-

nary stress incontinence (group E) showed the same results. Namely, the standard anatomic landmarks did not show significant differences, except point C, but some of the new proposed landmarks, such as: Vas, Va, Vp, SU, D, (Vas–Va), (Vps–Vp), (Aa–Ba1), (Ap–Bp1) showed significant differences between the groups, especially during Pm (Tab. 3).

In the Table 4, we present the differences of pelvic organ position in patients with a genital prolapse stage I or II with supravaginal cervical elongation (group B) vs. patients with stage 0 prolapse and coexisting stress incontinence (group E). We can see again that the standard anatomic landmarks did not show significant differences, except point C. Nevertheless, some of our proposed new landmarks, such as: Vas, Va, Vp SU, (Vas–Va), (Vp–SU), (Vps–Vp), (Aa–Ba1) showed significant differences between the groups.

Comment

Our modification of the POPQ system includes some additional defined points, which were proposed in purpose to offer more precise definition and distinction of different kinds of genital prolapse, as well as to achieve a more complete reparation of the deteriorated anatomic structures during the future operative procedures. Our opinion is that: point Aa corresponds to the approximate location of the urethro-vesical junction and it could be important in cases with urinary stress incontinence or urethrocele; the level of point Ba could indicate the grade of present cystocele. Ba1 is our new defined point, which is located in the middle of the distance between the reflection of the urethro-vesical junction on the anterior vaginal wall and the attachment of this wall to the uterine cervix, could be a useful indicator of the severity of cystocele. Our opinion is that the first event of the genital prolapse in cases without supravaginal elongation of the uterine cervix is a deterioration of the uterosacral ligaments and, as a result, the upper paracolpium become deteriorated subsequently. Our results, present on the table I, are the evidence that this mechanism could be true. Namely, during an increased strength downwards during Pm, most of our proposed new points, which indirectly reflect the strength of upper paracolpium and uterosacral ligaments, such as: Ba1, Vas, Va, Vp, Vps, SU, D and Bp1 comes down, that means there is no opposite strength, such as intact uterosacral ligaments, that could act upwards during this maneuver. In cases with cervical elongation, the first event in genital prolapse development is a deterioration of the upper paracolpium, but the uterosacral ligaments are still strong enough and act as an opponent strength during Pm and pull the deteriorated upper paracolpium upwards. The evidence of that mechanism is the situation in group B when the point Ba1 and Vas came up during Pm. The long-term action of these opposite strengths, i.e. the intra-abdominal pressure downwards and uterosacral ligaments upward results in the elongation of uterine cervix, which can be sometimes pronounced. In these cases, the surgeon may have problems to reach the uterosacral ligaments during vaginal hysterectomy. Our results could be a good evidence of the above mentioned mechanism. So, the landmarks:

Tab. 4. Quantitative description of pelvic organ position with anatomic landmarks in patients with genital prolapse stage I or II with with supravaginal cervical elongation (group B) and patients with stage 0 prolapse and coexisting stress incontinence (group E).

POPQ stage	Valsalva maneuver		Pozzi maneuver		t ₁ 1-2	t ₂ 3-4
	Bv group (2) (n=50)	Ev group (2) (n=108)	Bp group (3) (n=59)	Ep group (4) (n=53)		
Aa	-1.33±0.76	-1.75±0.98	-0.73±1.22	-1.56±1.28	0.56	0.48
Ba	-0.48±0.99	-1.69±1.04	-0.92±1.18	-1.52±1.30	0.84	0.34
Ba1	-1.97±0.72	-4.60±1.19	-3.37±1.08	-4.98±1.20	1.89	1.00
Vas	-4.40±0.83	-7.85±1.25	-4.79±1.21	-8.30±1.20	3.03§	2.07*
Va	-3.42±1.16	-7.78±1.65	-1.86±1.35	-7.96±1.14	2.17*	3.45‡
C	-2.16±1.33	-7.18±1.48	-0.58±1.20	-7.77±1.19	2.52†	4.49‡
Vp	-4.24±1.22	-8.36±1.11	-2.73±1.08	-8.60±1.12	2.50†	3.76‡
SU	-7.49±1.18	-9.31±0.93	-5.93±0.98	-9.37±1.20	1.21	2.22*
D	-8.71±1.21	-9.92±0.78	-7.15±0.99	-9.56±1.24	0.84	1.52
Vps	-7.43±1.43	-8.87±0.86	-6.43±1.11	-9.04±1.23	0.86	1.56
Bp1	-6.49±1.17	-6.19±1.19	-5.62±1.18	-6.10±1.11	0.18	0.30
Bp	-2.37±1.08	-2.68±0.74	-2.09±1.31	-2.60±1.16	0.24	0.29
Ap	-2.63±1.09	-2.66±0.76	-2.63±1.30	-2.60±1.00	0.02	0.02
Vas - Va	1.12±0.99	0.15±0.33	2.99±0.26	0.33±0.36	0.93	6.04‡
Vp - SU	3.33±0.43	1.11±0.32	3.25±0.09	0.68±0.31	4.19‡	7.72‡
Vps - Vp	3.29±0.31	0.53±0.11	3.78±0.08	1.41±0.43	8.36‡	8.03‡
Aa - Ba1	0.65±0.33	2.86±0.87	2.66±0.36	3.50±0.76	2.38†	1.00
Ap - Bp	3.80±0.98	3.52±0.89	2.97±0.33	3.55±0.83	0.21	0.65

Legend as in Table 1

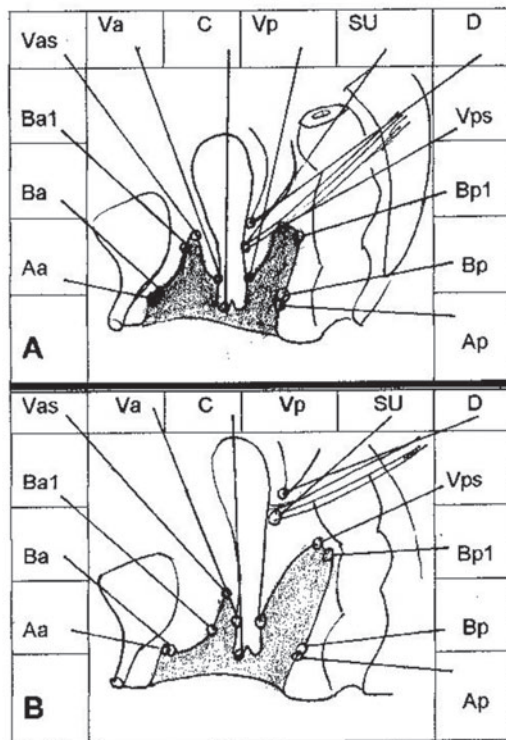


Fig. 2. Pelvic organ position and landmarks according to our modification of the POPQ system in cases with milder genital prolapse. A) cases without cervical elongation; B) cases with cervical elongation: SU, D, Bp1 have higher levels, but Ba1 and Vas have lower position in cases with cervical elongation; and point Ba1 has lower position than point Bp1 in the same patients.

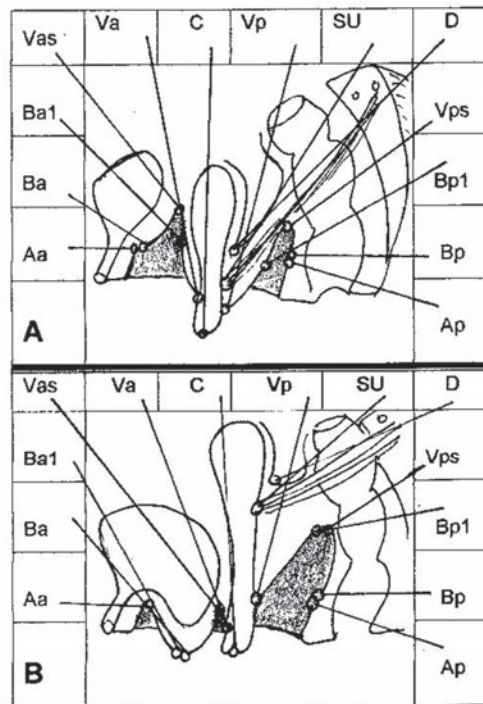


Fig. 3. Pelvic organ position and landmarks according to our modification of the POPQ system in cases with severe genital prolapse. A) cases without cervical elongation; B) cases with cervical elongation: SU, D, Bp1 have higher levels, but Ba1 and Vas have lower position in cases with cervical elongation; and point Ba1 has lower position than point Bp1 in the same patients.

SU, D, Bp1 had higher levels in group B vs. group A, as well as parameters: (Vas-Va), (Vp-SU), (Vps-Vp), (Aa-Ba1), (Ap-Bp1), which were higher in the same group. The evidence of this mechanism was even more impressive in groups with more severe prolapses (table 2). So, the landmarks: SU, D, Bp1 showed significantly higher levels in group D vs. group C, as well as the parameters: (Vas-Va), (Vp-SU), (Vps-Vp), (Aa-Ba1), (Ap-Bp1), which were significantly higher in the same group. We think that in cases with stage 0 prolapse and coexisting stress incontinence (group E) there is only a deterioration of the support of the urethro-vesical junction without deterioration of the upper paracolpium, uterosacral ligaments and elongation of the uterine cervix. The evidence we found in our results from the table 4. So, when we compared the pelvic organ position in patients with genital prolapse stage I or II with cervical elongation (group B) and patients with stage 0 prolapse and coexisting stress incontinence (group E), we found a significantly higher position of the landmarks which reflected the deterioration of upper paracolpium and uterosacral ligaments, such as: Vas, Va, Vp and SU in group E vs. group B, but those parameters which reflected the cervical elongation, such as level differences: (Vas-Va), (Vp-SU) and (Vps-Vp) were higher in group B vs. group E. Regarding the relationship between the landmarks of our modification and presence of cervical elongation we can give some additional expla-

nations and conclusions, which can be supported by the next two figures. In cases with cervical elongation we found that: 1. point Ba1 has a lower position than point Bp1; 2. points Ba1 and Va1 have lower position, but points SU and D have higher position vs. cases without cervical elongation (Figs 2 and 3).

Auwad et al (4), evaluating the acceptance and use of the POPQ system by specialists worldwide found that only 40.2 % of ICS and AUGS members routinely use this system and the reason was its complex nature. Muir et al (5), examining the method of describing pelvic organ prolapse in the per-reviewed literature since the introduction of the POPQ system, found that a prolapse staging system was not referenced, or a non-standardized staging system was used in 54.8 % of studies; POPQ system was the most common system used (22.6 %, followed by the Baden-Walker system (19.8 %). Salgado et al (6) reviewed classic classification, as well as genital prolapse stages and degrees and POPQ system and concluded that various attempts to standardize classification found problems, but according to them, detailed history, a systematic examination and multidisciplinary cooperation would be able to correct this dysfunction.

Conclusion

The effectiveness of our modification of the POPQ descriptive system in the diagnosis of supravaginal elongation of the uterine cervix in cases with genital prolapse was evaluated. According to our results, it seems that our modification of the POPQ descriptive system could be effective in the diagnosis of supra-

vaginal elongation of the uterine cervix in cases with genital prolapse. So we recommend it as a standard procedure in the evaluation of all cases with genital prolapse.

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