



The pelvic organ prolapse quantification system: stopping its application

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Introduction

Fu *et al.*, in their clinical-scientific article, questioned the use of the Pelvic Organ Prolapse Quantification system (POP-Q system) in the research or clinical evaluation (1). As early as 1995 POPQ system, the International Continence Society approved and recommended the pelvic organ prolapse quantification system for clinical practice and research even before the article was formally published (2,3). The American Urogynecology Society accepted it in January 1996, and the Society of Gynecologic Surgeons in March 1996. Soon after, the American Urology Society, the American College of Obstetricians and Gynecologists, and the Royal College of Obstetricians and Gynecologists recommended POPQs for all practitioners and researchers (3). However, these multiple endorsements and recommendations were accepted to apply for clinical practice and research without examining the scientific-clinical quality, credibility, creativity, and appropriate transparency. Since 1963, there have been several proposed systems; however, only two are currently in use (I) the Baden-Walker Halfway Scoring System, the second most applied system (4); (II) the Bump *et al.* POP-Q system, which is currently the most used system (2). The interest in the biomechanism of pelvic organ prolapse is documented

early in the medical literature; however, it remains unsolved from the scientific-clinical point of view (5,6).

The clinical researchers on the POP-Q system suggest that it should be revised and abbreviated for its burdensome rather than scientific-clinical quality (3). Therefore, this editorial will scientifically analyze the POP-Q system and present the pros and cons of the facts for using or not using it.

Anatomy of fixed and defined points

Bump *et al.* selected the hymen as the fixed anatomical point of the POP-Q system, and the authors noticed, quote: “Although it is recognized that the plane of the hymen is somewhat variable, it remains the best landmark available” (2). Ostrzenski has shown that the hymeneal ring is the landmark of the newly discovered vaginal outlet, which is not the extension of the vaginal wall, but a separate anatomical structure (7). This tissue architecture separates the female internal and external genitalia (*Figure 1*). It is not “somewhat variable”, as Bump *et al.* explained (2), but a rather significant anatomical distortion of the hymen is often seen in practice (*Figure 2*). To use of the hymen as the fixed anatomical structure is questionable. The ischial spine is an actual bony fixed point in the pelvis that is easy

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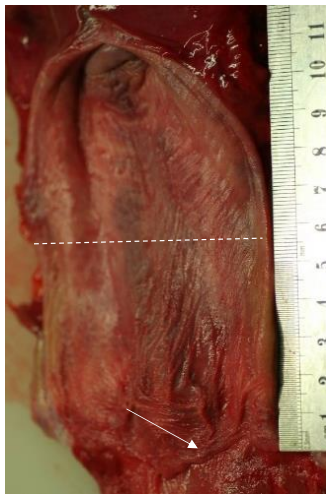


Figure 1 The extirpated vaginal wall from a 10-year-old cadaveric specimen resected the anterior vaginal wall and partially removed the lateral vaginal wall. It depicts the hymeneal ring (the white arrow) and the connection between the Mullerian duct and the urogenital origin (dotted white line). There are visible two segments of the vaginal wall (Mullerian and urogenital origins) and not 3-segments as are presented in the medical literature, from Prof. Ostrzenski's archives and the picture used with permission (7).

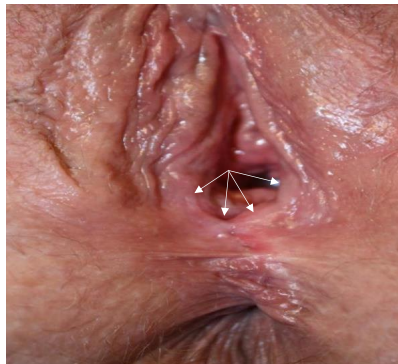


Figure 2 The distorted hymeneal ring is presented (the white arrows) from Prof. Ostrzenski's archives, and the photo is used with permission (7).

to palpate during a vaginal examination with one finger and is usually located 3–4 cm from the hymen or the distal vaginal wall and can be identified at about 4 and 8 o'clock and corresponds to the vaginal apex (8). In addition to the ischial spine, the pubic bone and pubic symphysis are fixated points that can be used for pelvic organ prolapse evaluations. However, a well-designed and well-executed new study must establish how to use these natural fixed

points in pelvic organ prolapse (POP) evaluation.

Aa, Ba, Ap, and Bp's defined points were arbitrarily established and did not represent a particular anatomical structure, as point C stands for the anatomical structure of the uterine cervix, and point D represents the vaginal fornix. Therefore, any system should include natural anatomical landmarks. In addition, clinical researchers should avoid creating arbitrarily defined points since it provides no tangible clinical information for POP.

The urogenital hiatus versus levator ani hiatus

The POP-Q system recommends measuring genital hiatus (GH), quote: "from the middle of the external urethral meatus to the posterior midline hymen" (2). However, such a measurement does not appropriately measure the GH or levator ani hiatus (LH). The LH is divided into two segments (I) the anterior (urogenital hiatus) through which the urethra and the vagina pass (II) the posterior rectal hiatus is the passage for the anal canal. Additionally, the POP-Q system does not include in its measurement a space between the ½ upper urethral meatus and the posterior surface of the pubic symphysis and does not include the posterior levator ani hiatus. Yet, the urogenital hiatus is not measured accurately, and only fragments are incorporated into the POP-Q system. Today, magnetic resonance imaging (MRI) can verify clinical measurements of the levator ani hiatus in axial and sagittal planes (8,9). Also, pelvic ultrasound (US) can confirm LH; however, an MRI examination provides more precise results (9). MRI and US confirmed the accuracy of Delancey and Hurd's finding that the mean was $5.4 \text{ cm}^2 \pm 1.71 \text{ SD}$ in women without vaginal prolapse and no prior (8-10).

The levator ani hiatus is the gap between both sides of the levator ani muscles through which the urethra, vagina, and rectum pass. Therefore, the enlarged levator ani hiatus is closely associated with pelvic organ prolapse. Measure the levator ani hiatus or urogenital hiatus can be done clinically without trouble; however, not by the POP-Q system's method (2). Instead, this author measures the levator ani hiatus from the symphysis pubis to the posterior-external anus. A sizable body of medical literature shows that the levator ani hiatus plays a significant role in pelvic organ prolapse, and its measurement should be included in clinical evaluation and research investigations (10-13). Additionally, MRI and ultrasound images can verify clinical levator ani measurements, which can serve as an important marker for underlying pelvic floor muscle damage and predict the

recurrence of pelvic organ prolapse (9,13,14).

The perineal body (PB)

Multiple anatomical structures insert into the PB, such as the anorectal junction, the rectovaginal septum, the posterior-distal vaginal wall, the superficial fascia of the levator ani muscles, the lateral vaginal wall, the internal anal sphincter muscle, the dorsal perineal membrane, the superficial transverse perineal muscle, and bulbocavernosus muscles. In addition, the pubovaginalis and puborectalis muscles connect the PB to the levator ani hiatus (7). The POP-Q system recommends vertical measurement, which is impossible due to the PB's location being under the posterior-distal vaginal wall, and this location is the horizontal orientation (7). The POP-Q system, most likely, adopted textbook descriptions that the PB is located within the posterior perineum (15,16). Therefore, the POP-Q system recommendation to measure PB vertically does not make anatomical sense (7). The appropriate measure of PB will be in horizontal orientation within the posterior-distal vaginal wall.

Including the perineal body in the POP-Q system is controversial. The scientific-clinical research findings showed no significant changes in PB associated with female pelvic organ prolapse and do not support the inclusion of PB into the POP-Q system (17). Another study's results support the inclusion of PB to measure it on the maximal Valsalva maneuver (18). However, the limited research data will not allow concluding how defective PB affects female urinary and fecal incontinence (19). A well-designed and well-executed scientific-clinical study is needed to resolve this controversy.

Total vaginal length (TVL)

TVL measurement to assess pelvic organ prolapse has very little clinical value, but it is included in the POP-Q system evaluation. Some authors postulate that it can help to position the cervical location in total uterine prolapse (20). In general, no data in the medical literature supports that TVL measurement provides crucial information to justify using it in clinical settings.

In summary, the POP-Q system is not based on current knowledge of gross, topographic, and functional anatomy; for these reasons, recommendations for using it in clinical evaluation or research should be reconsidered. Arbitrarily defined points of Aa, Ba, Ap, and Bp (-3 to + 3) provide

little clinical information. Furthermore, measuring only the genital hiatus is an unfitting recommendation. To follow the POP-Q system recommendation and take the measurement from not fixed ½ external urethral meatus, it will be a fragment of urogenital hiatus. The elongated-widened levator ani hiatus is considered causation for POP. The perineal body's role in pelvic organ prolapse is not determined scientifically; therefore, before getting the answer on this topic, it is not a measurement that provides information either as a clinical tool or scientific data. Thus, the role of the PB in POP should be determined. The total vaginal length role in pelvic organ prolapse is unclear because no informative scientific data provides sufficient information on why the vaginal length should be measured in pelvic organ prolapse. Therefore, not the genital hiatus but levator ani hiatus should be included for POP evaluation, and the POP-Q system, in the current version, is not helpful in clinical assessment or research investigation of POP.

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