# Modified Posterior Perineoplasty in Women

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*OBJECTIVE: To determine the applicability of dorsal perineal membrane (DPM) and urethrovaginal sphincter muscle (UVSM) site-specific defect reconstructions. The secondary objective was to establish how these reconstructions affect women's physical, emotional, and social well-being.*

*STUDY DESIGN: An observational cohort study was conducted for 24 months on 3 patients. Clinical examinations with pelvic organ prolapse quantification panel, validated instruments of the Pain Numeric Scale, the Modified Body Image Scale (M-BIS), and the Female Sexual Function Index (FSFI) were applied preoperatively and 6 months postoperatively.*

*RESULTS: Intraoperatively the DPM and the UVSM site-specific defects were identified and their reconstructions were performed without surgical complications. Postoperatively, symptoms have subsided, perineal body and genital hiatus returned to expected limits, FSFI increased, and M-BIS improved.*

*CONCLUSION: In this study group, modified posterior perineoplasty was applied with ease and the operation alleviated physical, emotional, and social symptoms associated with posterior perineum defects.* (J Reprod Med 2015;60:109–116)

**Keywords:** dorsal perineal membrane, modified perineoplasty, perineal membrane, perineal site-specific defects, perineoplasty, smooth vagina, urethrovaginal sphincter muscle, vaginal rejuvenation, wide vagina.

***This study's results indicate that consideration should be given to revising the classic perineoplasty (perineorrhaphy) and episiorrhaphy.***

In 1983 Oelrich presented his work related to the existence of the perineal membrane as a 3-dimensional, complex, mass-like structure on which the perineal body rests.[1] Other studies verified Oelrich's findings.[2,3] However, surgical reconstruction of either the ventral or dorsal perineal membrane (DPM) has not yet been developed. Therefore, it becomes imperative to learn how to identify intraoperatively the location of the dorsal perineal membrane, particularly in view of the fact that anatomy textbooks still present a noticeable anatomic discrepancy in the DPM's actual location and/or simply omit this topic or continue to use the term urogenital diaphragm.[4,5]

The hypothesis was advanced that DPM and urethrovaginal sphincter muscle (UVSM) site-specific defects could play a role in compromising the integrity and function of the posterior perineum. The primary objective was to determine the applicability of the DPM and UVSM site-specific defect reconstructions. The secondary objective was to establish how these reconstructions affect women's physical, emotional, and social well-being. To test this hypothesis, the surgical stratum-by-stratum dissection

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of the posterior peritoneum to identify the DPM and UVSM was performed. In view of recent clinical studies, the acquired sensations of wide and smooth vagina can be caused by site-specific defects of the vaginal wall, vaginal introitus, posterior perineum, or combination of them; therefore, it is vital to reconstruct all defects including the DPM and UVSM.[6,7]

### *Materials and Methods*

Patients were recruited from a private practice at the Institute of Gynecology, Inc., St. Petersburg, Florida, and the Bioethics Committee of the Warsaw Medical University approved the study. All of the patients in this study met inclusion criteria and were clinically examined including pelvic organ prolapse quantification (POP-Q) panel application. Subjects were tested preoperatively and at 6-month postoperative intervals to determine the degree of dyspareunia by the Numeric Pain Scale (0–10: 0 represents no pain; 1–4, mild; 5–7, moderate; 8–10, severe form of superficial dyspareunia). Perineal body and genital hiatus measurements were performed as defined by the POP-Q profile with adjusted means for vaginal parity.[8,9] All subjects were tested by the validated, multidimensional, self-reported Female Sexual Function Index (FSFI) questionnaire with a 19-item questionnaire assessing sexual function and quality of life.[10] Additionally, the Modified Body Image Scale (M-BIS) instrument was utilized to determine self-perceived body image and quality of life[11] (Table I).

Superficial dyspareunia was reproduced on physical examination by applying finger pressure on the posterior vaginal introitus. In order to eliminate vulvar vestibulitis syndrome, muscle spasm, or trigger points on the superficial transverse perineal muscle, localized provoked tests were performed in each case. To quantify dyspareunia pain, the Numeric Pain Scale (0–10) was used; perineal body ≤3.5 cm, genital hiatus ≥4.1 cm, FSFI ≤26, and the M-BIS with reported scores "quite a bit" and "very much" were included into this study. Patients who were pregnant or were diagnosed with any form of vulvar infection or any form of medical comorbidity, and those who selected other than local anesthesia by topical and infiltrative modes, were excluded from the study.

The study population included 3 women: Patient 1 was a 32-year-old, Caucasian woman, $G_3P_{3003}$; Patient 2 was a 39-year-old, Caucasian woman, $G_2P_{2002}$; and Patient 3 was a 42-year-old, Caucasian woman, $G_4P_{4013}$. All of the patients presented with superficial dyspareunia (2 patients with moderate and 1 with severe dyspareunia) and with an acquired sensation of wide/smooth vagina, and anatomic disfigurement of the posterior perineum.

**Table I** *Ostrzenski's Modification of the Body Image Scale for Appearance of External Genitalia After Complex Old Perineal Laceration (Previous Surgery)*

| | Response | | | |
|---|---|---|---|---|
| **Question** | **Not at all*** **0** | **A little**** **1** | **Quite a bit**** **2** | **Very much**** **3** |
| 1. Have you been feeling self-conscious about your perineum appearance? | | | | |
| 2. Have you felt physically less attractive due to your perineal deformity? | | | | |
| 3. Have you been dissatisfied with your appearance when you dressed? | | | | |
| 4. Have you been feeling less feminine due to your perineal deformity? | | | | |
| 5. Did you find it difficult to look at your perineum while naked? | | | | |
| 6. Have you been feeling less sexually attractive/ feminine due to your perineal deformity? | | | | |
| 7. Did you avoid new relationships due to the way you felt about your perineal deformity? | | | | |
| 8. Have you felt dissatisfied with your body image due to your perineal deformity? | | | | |

*Answers measured as being within defined limits ("0").
**Answers measured as being abnormal (1 = mild, 2 = moderate, and 3 = severe).
Modified from Jelovsek and Barber: Table 1. The Modified Body Image Scale for subjects with posterior perineum abnormalities.[11]

The patients were clinically examined and tested pre- and postoperatively to determine the degree of superficial dyspareunia by the Numeric Pain Scale (0–10); perineal body and genital hiatus measurements for interpretation were performed in accordance with the POP-Q profile, the FSFI, and the M-BIS (Table I).

The informed consent advised patients that DPM and UVSM site-specific defect reconstructions were new surgical interventions and could not be considered as routine, acceptable, or standard operations. Also, the patient was informed that, in general, perineoplasty, or perineorrhaphy, is the traditional gynecologic procedure and is considered as the routine and accepted operation. No promises were made that the DPM reconstruction procedure would enhance sexual gratification. Written informed consent was presented within the standards delineated by the American College of Obstetricians and Gynecologists and was signed by both the patient and a witness. Additionally, minimally informed consent from all of the patients was obtained to permit publishing data related to modifying the posterior perineoplasty operation. The perineal membrane reconstruction was performed under local anesthesia in all patients.

An electronic search of the existing literature was carried out from 1900 to May 2010, including international congresses, using Medical Subject Headings (MeSH) and the search terms *dorsal perineal membrane, dorsal perineal membrane reconstruction, perineoplasty, perineorrhaphy, colpoperineoplasty, colpoperineorrhaphy, perineal membrane site-specific defects, wide vagina, smooth vagina, vaginal rejuvenation, vaginal introitus, posterior vaginal introital defects, cosmetic gynecology, female genital surgery, cosmetic genital surgery, female genitalia,* and *vaginoplasty,* which were selected and used in a search on ISI Web of Science (including conference proceedings), PubMed (from 1950), ACOGNET, ProQuest, OVID, Cochrane Collection, the Lancet Online Collection, MD Consultant, New England Journal of Medicine, American College of Physicians Online Resources, HighWire Journal, Citation Index Reference, and a manual search.

### *Surgical Technique*

The surgical method of this study was stratum-by-stratum dissection of the posterior perineum to identify the location of the dorsal perineal membrane and the urethrovaginal sphincter muscle and to determine their potential site-specific defects. A superficial midline skin incision was made from the posterior vaginal introitus to above the anterior border of the cutaneous external anal sphincter muscle with a No. 10 surgical blade. The next layer to dissect was the pubocervical fascia, which demonstrated the presence of site-specific defects (Figure 1A). Under the pubocervical fascia was the perineal body central tendon, which was totally separated from the perineal muscles. The perineal muscles came into view, which could be completely separated by previous obstetric trauma or failed perineoplasty. Above and not in contact with the superficial external anal sphincter muscle, the dorsal perineal membrane site-specific defects came into view (Figure 1B). Also, the levator anus muscle was identified with site-specific defects (Figure 1B). In this study all of the separated and defected edges within the site-specific defects of the fascias, the dorsal perineal membrane, urethrovaginal sphincter muscles, and the levator ani defects were identified and scarified before reconstruction. Just above it, the perineal membrane site-specific defect edges were scarified with a No. 15 surgical blade and the defects were closed with 2-0 delayed absorbable sutures in single-type mode (Figure 2). Upon reconstruction of the levator ani and perineal membrane defects, the separated perineal body musculature apparatus was identified (the bulbocavernosus, superficial transverse perineal, and superficial external anal sphincter muscles). The ruptured perineal muscles rested on the dorsal perineal membrane (Figure 2B). The urethrovaginal sphincter muscle (which is naturally intimately fused with the posterior surface of the dorsal perineal membrane) defect was located in each case under the dorsal perineal membrane, and the site-specific defect of this structure was also reconstructed. The reconstruction of the perineal body was initiated dorsally from the cutaneous external sphincter muscle (Figure 3) by reconstructing the superficial external anal sphincter muscle, superficial transverse perineal muscle, and bulbocavernosus muscle. The central tendon of the perineum was restored. Upon reconstruction of the perineal body, the pubocervical fascia was reconstructed (Figure 4). The perineal skin incision's edges were approximated in usual subcuticular fashion (Figure 5).

Postoperatively the patients reported minimal discomfort, which was predominantly managed with external application of Dermoplast, an antiseptic and pain relieving spray (Medtech, Jackson, Wyoming). Occasionally acetaminophen, 2 tablets

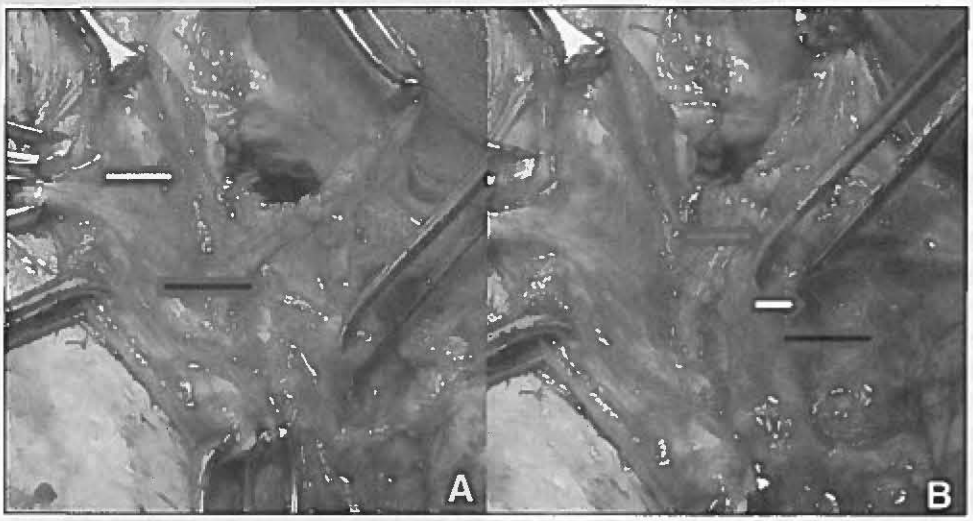


**Figure 1**
(A) The pubocervical fascia site-specific defect (black arrow) and perineal muscle defects are depicted (the fragment of the muscle is held with the instruments before restoration. The hole represents complete rupture of the perineal body. The partially torn bulbocavernosus muscle is depicted (white arrow). On the right side the bulbocavernosus muscle is fragmented. (B) The lacerated perineal muscles were gently elevated (white arrow) and the significant dorsal perineal membrane defect with well-defined edges is depicted (lowest black arrow); the multiple pubocervical fascia elliptical defect edges are shown (gray upper arrow). Through the perineal membrane defect the levator anus muscle is visible with identifiable multiple defects of the superior surface (black arrow).

every 4 hours, was used by the patients as needed. At 6 weeks postoperatively, patients were advised to commence (and continue) exercise of the pelvic floor muscles.

### *Results*

All patients reported posterior perineal deformity associated with superficial dyspareunia, which was reproduced in each case of the study by gentle pressure with the index finger of the examiner on the areas of posterior introitus. The numeric pain scale for dyspareunia in patients 1, 2, and 3 dropped to zero from 6, 7 (moderate pain), and 10 (severe pain), respectively, after the modified perineoplasty operation. On the initial preoperative physical examination the anus and the vaginal introital orifices were gaping. The perineal body measurements were as follows: in Patient 1 it increased from 1.5 cm preoperatively to 3.7 cm postoperatively; in Patient 2, from 2.2 cm to 3.9 cm; and in Patient 3, from 1.8 cm to 3.4 cm. The genital hiatus in Patient 1 was decreased from 4.1 cm preoperatively to 3.5 cm postoperatively; in Patient 2, from 3.9 cm to 3.3 cm; and in Patient 3, from 4.2 cm to 3.1 cm. Preoperatively the FSFI scores were 14, 22, and 8 in Patients 1, 2, and 3, respectively. Postoperatively the FSFI scores

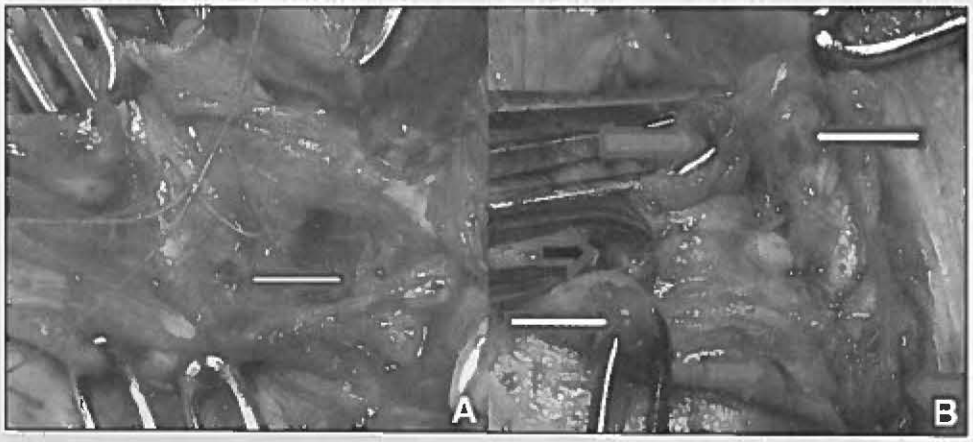


**Figure 2**
(A) The perineal membrane site-specific defect edges were scarified (refreshed) with a No.15 surgical scalpel blade, and then the edges were sutured. Arrow shows ruptured and separated superficial anal muscles. (B) The perineal membrane reconstruction has been completed. Depicted are the separated bulbocavernosus muscles (2 white arrows), the ruptured urethrosphincter muscle (long gray arrow), the superficial external sphincter muscles (between the 2 short gray arrows), and the superficial transverse perineal muscle (black arrow).

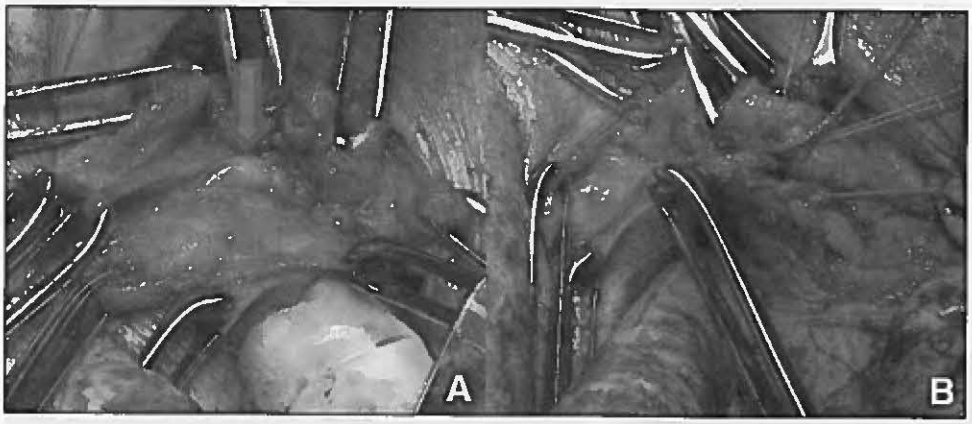


**Figure 3**
(A) The intact rectovaginal fascia is noted just above the surgeon's index finger, which was inserted into the anal canal. At the finger's tip a fragment of the reconstructed dorsal perineal membrane is visible (gray arrow). (B) The external anal sphincter muscle reconstruction was completed.

increased to 30, 31, and 29, respectively (Table II). The M-BIS improved from "quite a bit" and "very much" to "not at all" (Table I).

All patients underwent stratum-by-stratum surgical dissections, which revealed multiple site-specific defects on multiple levels of the posterior perineum (the skin, pubocervical fascia, hymenal ring, perineal body, dorsal perineal membrane, urethrovaginal sphincter muscle, and the levator ani muscles). Intraoperatively the DPM and the UVSM were identified when stratum-by-stratum surgical dissections were applied in all patients. Additionally, DPM and UVSM site-specific defects were recognized and reconstructed effortlessly. On the average the operation was performed within 47 minutes and executed without difficulties or intraoperative complications. After the operation symptoms subsided and pleasing aesthetic looks with acceptable surgical outcomes were reported by all subjects (Figures 7 and 8). Also, the perineal body and genital hiatus measurements were brought to defined limits elsewhere.[8,9]

The electronic and manual literature search documented that the intraoperative identification of dorsal perineal membrane site-specific defects and their reconstruction is the first presentation in the scientific-clinical literature. Therefore, this operation should be considered as a new surgical technique for reconstruction of perineal membrane defects and the urethrovaginal sphincter muscle.

### *Discussion*

Taking into account that the perineal body structures are intimately fused with the superior surface of the DPM, it is imperative to reconstruct this foundation on which the perineal body rests[1-3] (Figure 6A). The DPM site-specific defects were identified, in this study, just under the perineal body muscles (Figure 1B). The stratum-by-stratum surgical dissections documented multiple site-specific defects in

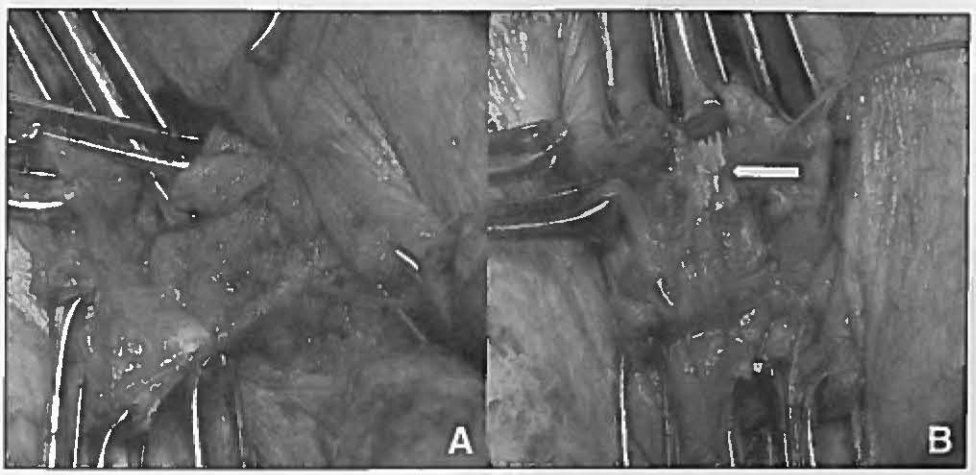


**Figure 4**
(A) Reconstruction of the perineal muscles above the dorsal perineal membrane. (B) The reconstructed perineal muscles and the pubocervical fascia (white arrow).


**Figure 5**
(A) The posterior perineum before reconstruction. The external anal sphincter is gaping (the patient was not under general anesthesia at this time). (B) The posterior perineum after reconstruction. The perineal body measurement is depicted and visibly enlarged when compared to the preoperative view. Also, the anal orifice is closed (the patient was still under general anesthesia).

different layers of the posterior perineum even after the previous classic perineoplasty was performed (data obtained from the original postoperative surgical report). The DPM and UVSM defect reconstructions created a platform upon which the posterior perineal body structures rest and the posterior vaginal introital integrity depends (Figures 2–4).

Findings of this study suggested that the DPM and UVSM site-specific defects could result from obstetrical trauma or failure of classic perineoplasty surgery (data obtained from the original postoperative surgical report) and that they can be responsible for symptoms of superficial dyspareunia. Additionally, this clinical study supports the hypothesis that DPM and UVSM site-specific defects exist and play a significant role not only in maintaining the anatomic and functional integrity of the posterior perineum but also can cause moderate to severe superficial dyspareunia.

A limitation of this study is its small size sample, which can increase chances of an error. However, for the surgical concept and its execution the size sample was sufficient. Also, the modification of Body Image Scale questionnaire questions to fit specifically the posterior perineum abnormality can decrease its ability to detect a difference when it exists.

**Table II** *Female Sexual Function Index Results*

| | Patient 1 | | Patient 2 | | Patient 3 | |
|---|---|---|---|---|---|---|
| Domain tested | Before surgery | 6 Mos after surgery | Before surgery | 6 Mos after surgery | Before surgery | 6 Mos after surgery |
| Desire | 2 | 6 | 6 | 6 | 2 | 6 |
| Arousal | 4 | 6 | 4 | 6 | 0 | 5 |
| Lubrication | 4 | 6 | 6 | 6 | 0 | 6 |
| Orgasm | 0 | 6 | 0 | 5 | 0 | 6 |
| Satisfaction | 0 | 6 | 0 | 6 | 0 | 6 |
| Pain | 6 | 0 | 6 | 0 | 6 | 0 |
| Full scale score | 14 | 30 | 22 | 31 | 8 | 29 |

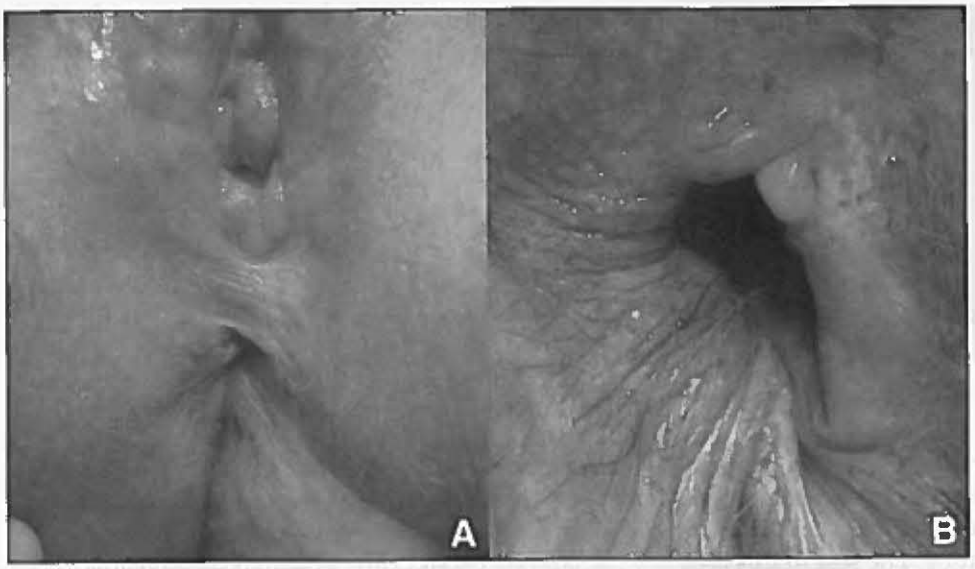


**Figure 6**
(A) The posterior perineum defects covered only by the skin and downward sagging of the perineal body is noticeable. (B) The cutaneous and superficial anal sphincter muscle multiple defects caused anal orifice gaping and the presence of the "dovetail" sign.

Replication of this study in an adequately powered randomized trial could eradicate these limitations and support the notion of revising the current perineoplasty and episiorrhaphy procedures. The results of this study support the notion that there is a need to reexamine the existing surgical intervention for female posterior perineoplasty and to consider the possibility of clinical implementation of the DPM and the UVSM reconstructions into a revised female posterior perineoplasty technique.

There was no clinical-scientific article addressing DPM or UVSM reconstruction; therefore, similarities and differences could not be offered in this report. The new surgical intervention presented here harbors significant potential for routine recommendation in clinical practice. Also, this clinical study strongly suggests that making a reverse triangular skin incision for posterior perineoplasty is highly questionable. One of the patients presented with a failed posterior perineoplasty, and the skin incision was made on the level of the posterior commissure with the triangle tip oriented towards the anal area

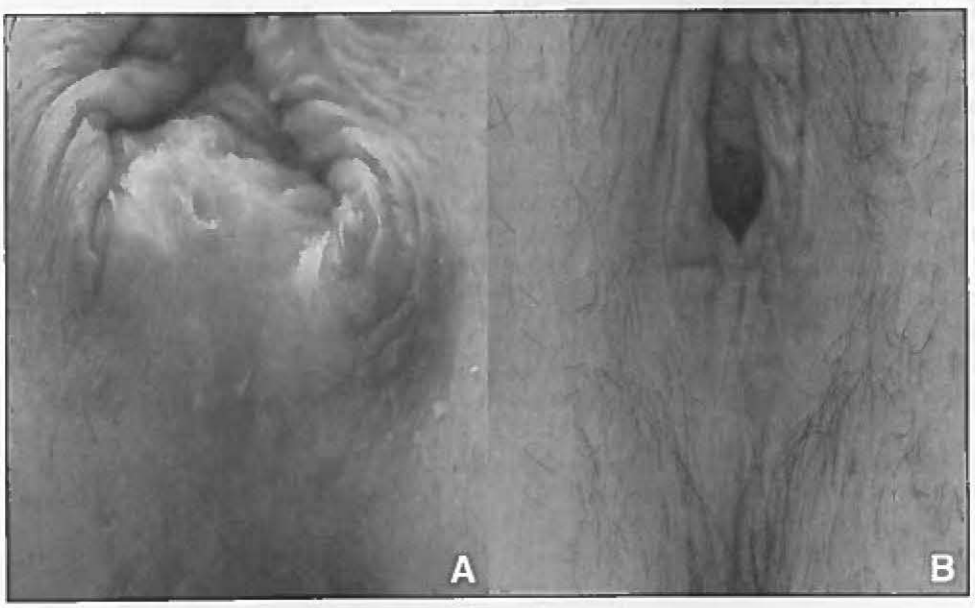


**Figure 7**
Patient 2. (A) The posterior perineum reconstruction performed previously (over 1 year prior) without the dorsal perineal membrane reconstruction. (B) The posterior perineum reconstruction executed with the dorsal perineal membrane reconstruction (6 weeks after surgery).

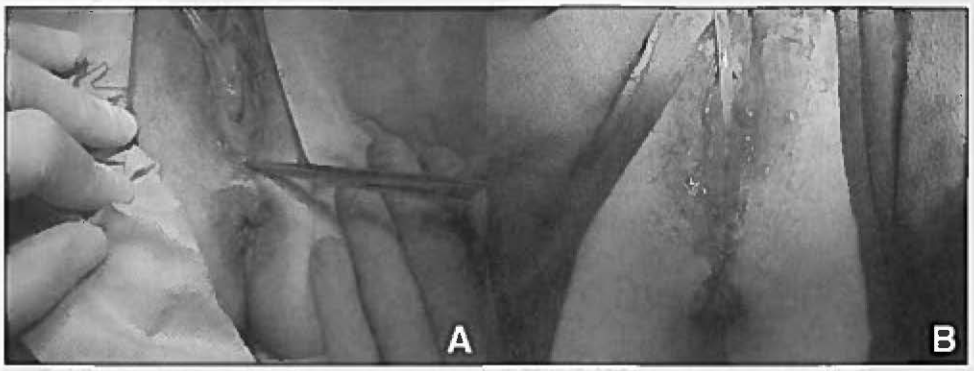


**Figure 8**
Patient 3. (A) The low posterior perineum after episiorrhaphy performed 7 years prior. (B) Posterior perineoplasty with site-specific perineal membrane reconstruction. Note how the gap of the vaginal introitus was faded.

(data obtained from the original postoperative surgical report). Such an incision unnecessarily opens the skin of the distal labia majora and creates unnecessary stretching in the midline. The scar in this area was very tender to palpation due to the skin being stretched. Additionally, bringing the skin's edge to edge in the midline for narrowing the posterior vaginal introitus is not reconstruction of the posterior vaginal introitus, and the posterior vaginal introitus site-specific defect(s) still needs to be addressed, if present.[7] In this author's opinion, a midline skin incision for posterior perineoplasty is a preferable method.

The DPM and the UVSM site-specific defects can be identified intraoperatively and surgically reconstructed. Women with complex posterior perineal old lacerations have decreased self-perceived body image, quality of life, and sexual function. Modified posterior perineoplasty eradicated symptoms of superficial dyspareunia, improved self-perceived body image, quality of life, and increased sexual function in this study group. The new procedure of DPM with UVSM reconstruction is easy to apply with acceptable surgical outcomes and very pleasing aesthetic results. This study's results indicate that consideration should be given to revising the classic perineoplasty (perineorrhaphy) and episiorrhaphy.

In conclusion, in this study group modified posterior perineoplasty was applied with ease and the operation alleviated physical, emotional, and social symptoms associated with posterior perineum defects.

## *References*

1. Oelrich TM: The striated urogenital sphincter muscle in the female. Anat Res 1983;2005:223-232
2. Stein TA, DeLancey JOL: Structure of the perineal membrane in females: Gross and microscopic anatomy. Obstet Gynecol 2008;111:686-693
3. Kato M, Matsubara A, Murakami G, et al: Female perineal membrane: A study using pelvic floor semiserial sections from elderly nulliparous and multiparous women. Int Urogynecol J Pelvic Floor 2008;19:1663-1670
4. Bagish MS, Karram M: Atlas of Pelvic Anatomy and Gynecologic Surgery. Second edition. Philadelphia, Elsevier Saunders, 2006, pp 55-56, Fig. 1-46 and Fig. 1-47
5. Nichols DH, Clarke-Pearson DL: Gynecologic, Obstetrics, and Related Surgery. Second edition. St. Louis, Mosby, Inc., 2000, pp 410-411
6. Ostrzenski A: An acquired sensation of wide/smooth vagina: A new classification. Eur J Obstet Gynecol Reprod Biol 2011;158:97-100
7. Ostrzenski A: The first clinical classification of vaginal introital defects. Eur J Obstet Gynecol Reprod Biol 2011;159: 449-452
8. Bump RC, Mattiasson A, Bø K, et al: The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. Am J Obstet Gynecol 1996;175:10-17
9. Trowbridge ER, Fultz NH, Patel DA, et al: Distribution of pelvic organ support measures in a population-based sample of middle-aged, community-dwelling African American and white women in southeastern Michigan. Am J Obstet Gynecol 2008;198:548.e1-548.e6
10. Rosen R, Brown C, Heiman J, et al: The female sexual function index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. J Sex Marital Ther 2000;26:191-208
11. Jelovsek E, Barber MD: Women seeking treatment for advanced pelvic organ prolapse have decreased body image and quality of life. Am J Obstet Gynecol 2006;194:455-461