REVIEW

Vaginal Rejuvenation: An In-Depth Look at the History and Technical Procedure

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This article is a comprehensive review of the pelvic cosmetic procedure, vaginal rejuvenation. The review covers the inception, evolution, and challenges involved with the operation. Comparison with the classic procedures from which it was derived as well as similar current procedures designed for pelvic organ prolapse are covered. Indications, patient selection, expected outcomes, and technical aspects of the operation itself are addressed.

Vaginal rejuvenation describes a class of elective gynecologic operations designed to alter the dimensions of the vaginal canal and perineum. These procedures are derived from classic gynecologic surgical treatments for vaginal herniations (pelvic floor defects) of the anterior vaginal wall (cystocele), the posterior vaginal wall (rectocele), and the vaginal apex (enterocele), and for attenuation of the perineum.[1] The focus of the classic procedures is to restore anatomic support and function by repairing damaged tissues and reinforcing them where necessary.[2] Rejuvenation procedures share many characteristics with these therapeutic operations, but they focus primarily on tightening the lower vagina and perineum to dimensions desired by the patient, regardless of whether pelvic floor defects are present or absent (Figures 1 through 3). In some instances, rejuvenation procedures are combined with therapeutic procedures. Vaginal rejuvenation is distinct from labioplasty and other surgeries that target the cosmetic appearance of the external vulvar structures.

Although the results of vaginal rejuvenation are more tactile than visual, they are properly classified as cosmetic procedures because they are performed exclusively upon healthy and asymptomatic patients upon their request alone. Vaginal rejuvenation is not a treatment for sexual dysfunction, pelvic floor defects, or gynecologic pathology, and offers no medical benefit.

Vaginal laxity or the perception thereof is the basis for requests for vaginal rejuvenation. The cause-and-effect relationship between vaginal childbirth and vaginal laxity is not a matter of dispute. Nonetheless, the magnitude of laxity, the impact of such changes on sexual satisfaction for both patient and partner, and the simultaneous presence of pelvic floor defects vary widely between individuals. Challenges in patient selection include careful screening for sexual dysfunction, body dysmorphic disorder, partner-centric motivations, and true pelvic floor pathology.

Evolution

California gynecologist David Matlock was the first to market this type of surgery in the public eye in the late 1990s. His anecdotal experiences with patients undergoing anterior and posterior colporrhaphies for medical indications and reporting increased sexual satisfaction postoperatively led him to offer variations of these procedures to women[3] that targeted the sexual side effects as their primary goal (David Matlock, oral communication). He was also the first to establish proprietary training and franchising for physicians in these techniques, developing a company known as the Laser Vaginal Rejuvenation Institute. His business model and lack of long-term data were criticized in a Committee Opinion issued by the American College of Obstetricians and Gynecologists in 2007.[4] During the past decade, the number of physicians performing these operations has been steadily increasing, and public awareness has reached a level commensurate with long-established cosmetic procedures such as liposuction and breast augmentation.

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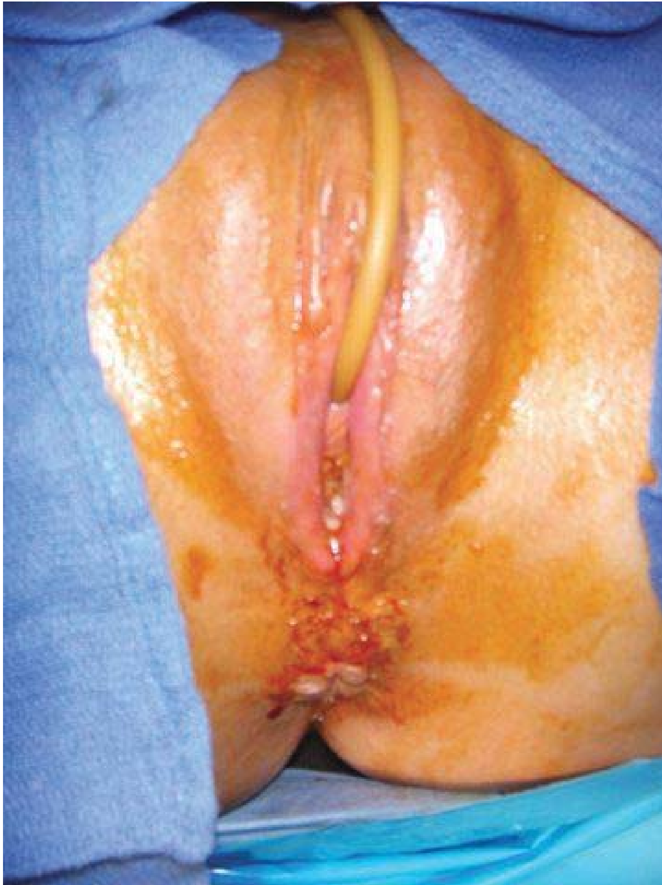

Figure 1. *Preoperative view of short perineal body, cystocele, and rectocele. Photo courtesy of D. Kent, MD.*

Figure 2. *Immediate postoperative view of vaginal rejuvenation repair with labia minora labioplasty. Photo courtesy of D. Kent, MD.*

Preoperative Motivations

The female sexual experience is a complex and dynamic blend of anatomic and psychologic factors. Patients requesting vaginal rejuvenation procedures may present with a combination of realistic and unrealistic expectations. Public information may be incomplete, misleading, or impertinent to the prospective candidate's stated concerns and expectations. Nonetheless, the public is aware that laxity of the vaginal walls is a common sequela of vaginal childbirth and that procedures are available to correct this condition.[5] Whether the correction of vaginal laxity equates with a perceived improvement in an existing nondysfunctional sexual experience is a matter of individual opinion. Whether a perceived improvement in the sexual experience from this surgery is solely due to anatomic alterations or postoperative perceptions of control over one's body, increased confidence, or an enhanced sense of well-being are challenging questions that parallel those raised in all types of cosmetic surgery. In our experience, most women seeking vaginal rejuvenation feel that vaginal laxity is an undesirable condition due to inadequate friction, sensitivity, and tightness compared with their recollections of their sexual experiences prior to childbirth. Pathologic motivations for vaginal rejuvenation, as for all cosmetic procedures, are uncommon but must be discerned prior to considering surgery. Similarly, latent existing or previously undiagnosed gynecologic or urologic pathology must be addressed in advance of any cosmetic concern.[6]

There is a misconception among gynecologists and sexual therapists that vaginal rejuvenation procedures are intended to improve or treat sexual dysfunction.[7] This is not the case for rejuvenation procedures because the presence of sexual dysfunction indicates that the prospective patient is not a candidate for an elective cosmetic procedure that lacks any medical benefit. Not infrequently, a patient with complaints of sexual dysfunction may inadvertently present for vaginal rejuvenation surgery because she lacks the understanding that her affliction

Figure 3. *Patient 6 weeks after vaginal rejuvenation with labioplasty. Photo courtesy of D. Kent, MD.*

is a known medical condition with defined evaluation and management criteria. A strong foundation in gynecology is requisite to the appropriate triage of such women.

Data

Vaginal rejuvenation procedures reduce the caliber of the lower (outer) third of the vaginal canal. This is an undisputed fact and is the essence of the operation. The contention that this reduction in caliber necessarily, usually, or reliably results in the improvement of an existing nondysfunctional sexual experience has never been studied directly. Difficulties in conducting scientific studies of the effects of these procedures include reluctance by some surgeons to divulge specifics of surgical technique, variations in the extent and nature of surgery performed, variations in terminology, and a reluctance on the part of cosmetic patients to participate in extended perioperative assessments and nebulous outcome measures. Despite these obstacles, data specifically addressing the positive sexual effects of vaginal rejuvenation surgery are necessary for the acceptance of these procedures by the majority of physicians.

Studies addressing changes in sexual functioning before and after gynecologic surgery for the management of symptomatic medical conditions are of limited value.[8] Women experiencing severe pain, abnormal bleeding, urinary or fecal incontinence, advanced degrees of pelvic organ prolapse, or anxiety about a pelvic tumor are simply not in the same frame of mind regarding sex as are women lacking gynecologic pathology who are merely seeking to enhance a positive experience. Also, the treatments of these conditions may involve additional interventions that alter hormonal status[9,10] and confound the ability to extract the effects of surgery alone.

The risks of vaginal rejuvenation procedures have not been studied directly, but would appear to share similarities with medically indicated reductions of the vaginal caliber for the treatment of rectocele.[11] Both procedures involve dissection, resection, and suturing of the same anatomical structures, albeit to different degrees. In this regard, the medically indicated operations are generally more extensive because symptomatic pelvic floor defects are rarely limited to the lower third of the vaginal canal or exclusively to the posterior vaginal wall. By the same token, the cosmetic patients seeking vaginal tightening are healthy and not usually plagued by comorbidities that may adversely affect healing (obesity, diabetes, etc), because these conditions are usually exclusion criteria for most cosmetic procedures.

Preoperative Assessment

Vaginal rejuvenation is a type of cosmetic surgery. As such, the tolerance for morbidity is much lower than that for therapeutic operations. The best candidates for these operations are physically fit, nonobese nonsmokers. They should fall under classes ASA I or ASA II of the American Society of Anesthesiologists physical status classification system. Patients in suboptimal health and those who require intense perioperative surveillance are not good prospects for this type of surgery.

A complete documented physical evaluation should precede any surgery if the patient has not had a recent examination. A history of previous vaginal surgery, vaginal childbirth, or gynecologic or urologic symptomatology mandates a complete, documented gynecologic evaluation. Any anatomic distortion, infection, or urogenital dysfunction with the potential to increase the risk of surgical injury or perioperative morbidity should be assessed and managed by appropriate means prior to surgery. Blood work analyses include testing for signs of infection, anemia, and coagulopathy. Pregnancy testing on the day of surgery is mandatory regardless of contraceptive history.

Common gynecologic findings that would preclude an isolated vaginal rejuvenation procedure include active vaginal infections, impaired neuromuscular function along the distribution of the pudendal nerves,[12] and varying degrees of pelvic organ prolapse.[13] Pelvic

floor hernia-type defects such as rectocele or enterocele, if undiagnosed and left untreated at the time of vaginal rejuvenation surgery, would likely worsen or cause the rejuvenation site to loosen over time.[14] Anterior vaginal defects associated with cystocele[15] (paravaginal and midline defects) typically worsen if left untreated at the time of medically indicated posterior colporrhaphies because they become the areas of least resistance to intra-abdominal pressure.

Sexual dysfunction is as a contraindication to vaginal rejuvenation surgery. Patients presenting with issues of impaired arousal, vulvodynia, vestibulitis, levator ani syndromes,[16] and other such conditions will not display a positive therapeutic response to a reduction of the vaginal caliber because none of these conditions are associated with a large vaginal caliber or the perception thereof.[17,18]

The surgeon and patient contemplating a vaginal rejuvenation procedure must have a method by which to measure the vaginal caliber in order to establish both a starting point and a targeted endpoint. A commonly used technique is to measure the distance in fingerbreadths between the medial edges of the puborectalis (levator ani) muscles. This is performed by inserting 2 fingers of the examining hand into the lower vagina and spreading them bilaterally until the muscles can be felt. The fingerbreadth measurement can then be translated to centimeters and recorded for better correlation between examiners. If the muscle edges cannot be palpated, the patient is asked to contract the muscles by either active tension or coughing. Failure to identify the muscle edges in this fashion signals the possibility of muscle atrophy and/or pudendal nerve damage.

Technology in Vaginal Rejuvenation

Vaginal rejuvenation involves approximation of the vaginal supportive fascia and musculature. Execution requires the dissection, identification, and placation of the fibromuscular and supportive layers of the vagina with the trimming of excess skin as in medically indicated gynecologic surgery (anterior/posterior colporrhaphy).[19] Reconstruction of the fibromuscular layers in an anatomically correct and cosmetic fashion requires suturing in layers. Hemostasis is achieved by conventional means. None of these technical steps require anything more than conventional instruments (scalpel, scissors, needle drivers).

Laser technology was introduced to vaginal rejuvenation surgery primarily for the convenience of the surgeon when making incisions through epithelium, and secondarily for its limited thermal damage versus other energy-based incision instruments. Contact (Nd:YAG) and CO_2 lasers are commonly used in many types of gynecologic surgery to minimize bleeding within the treatment site and to minimize thermal damage to surrounding structures (Figure 4). When used for vaginal epithelium incisions, there is less need for additional hemostatic maneuvers, and this enhances the efficiency of the procedure. Theoretical benefits include better healing of the incision line and less postoperative discomfort because there is less thermal damage. Vaginal rejuvenation does not involve laser resurfacing of the vaginal epithelium.

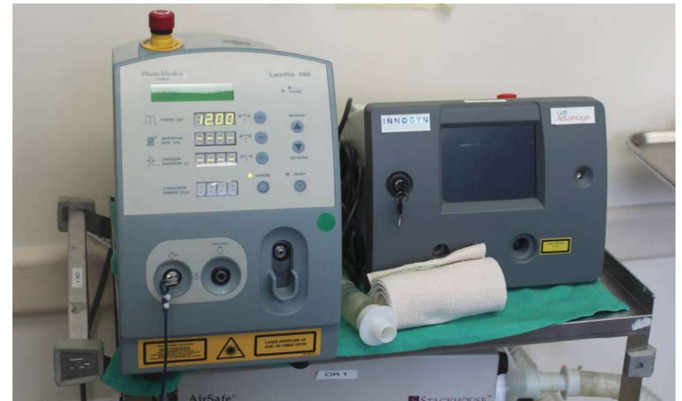

Figure 4. *Nd:YAG laser unit. Photo courtesy of D. Matlock, MD.*

Radiofrequency technology possesses characteristics similar to lasers and is popular within gynecologic offices and surgical suites. The technology is relatively inexpensive, reliable, available in a variety of designs, and well suited to vaginal surgery. Because radiofrequency cutting instruments produce limited thermal damage to surrounding structures, they too share the theoretical benefits attributed to laser incisions (Figure 5).

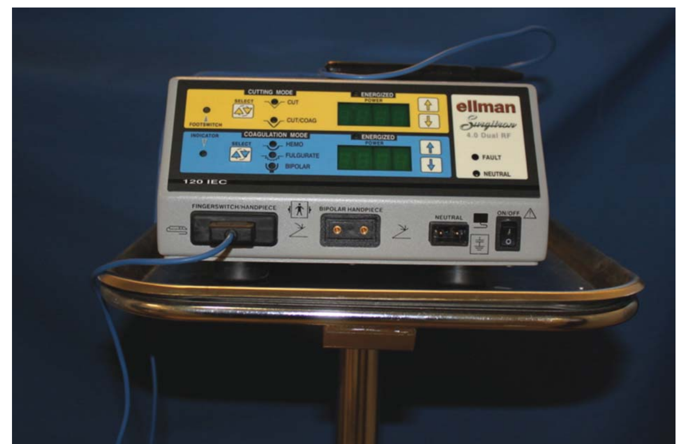

Figure 5. *Ellman radiofrequency unit. Photo courtesy of D. Kent, MD.*

Traditional electrosurgical, unipolar Bovie-type devices are commonly used for in-hospital gynecologic surgery. These tend to produce more thermal damage than either laser or radiofrequency instruments.

Vaginal Rejuvenation in Combination With Pelvic Floor Reconstruction

One of the complexities involved in vaginal rejuvenation is the frequent coexistence of significant pelvic floor defects that warrant simultaneous repair. The evaluation, examination, and interpretation of the findings in the patient who presents with the complaint of loose vagina, not feeling her partner during sex, or not liking the gaping appearance of her vagina are very important in establishing the appropriate candidates for vaginal rejuvenation surgery. Anatomy plays an important role in understanding the different repairs involved in pelvic support procedures.[20] The need for more complex pelvic reconstructive procedures such as the placement of pelvic mesh or sacral colpopexy typically takes priority over the cosmetic request because an intact and well-supported pelvic floor is a prerequisite to the long-term success of any rejuvenation procedure.[21–24]

History and physical examination will determine whether the patient is a candidate for vaginal rejuvenation or a more complex vaginal reconstruction.[25,26] The pelvic girdle is made up of a number of interlocking and overlapping supportive fascial layers and muscles that contribute to the overall support and normal functioning of the vagina and its surrounding structures.[27,28]

Vaginal rejuvenation primarily involves repair of the posterior vaginal wall and perineal body. Many patients seeking this procedure have an undiagnosed and asymptomatic rectocele that may vary in extent. It is important to understand the mechanics so that the appropriate procedure is performed.[1] The correct procedure in this scenario would be rectocele repair as the first step of the vaginal rejuvenation procedure.

According to some sources, 225 000 operations are being performed per year for posterior organ prolapse, with repair of the posterior wall of the vagina required in 87% of these surgeries.[29] Before one can adequately manage these patients it is important to understand the complex structural mechanics of posterior vaginal wall failure.[29] Posterior wall failure can involve failure of support of the perineal body and the levator ani muscles, which can result in a gaping genital hiatus. The levators supply tonic, cephalad action that holds the genital hiatus closed to a normal dimension in response to pressure. If the levators are weakened or

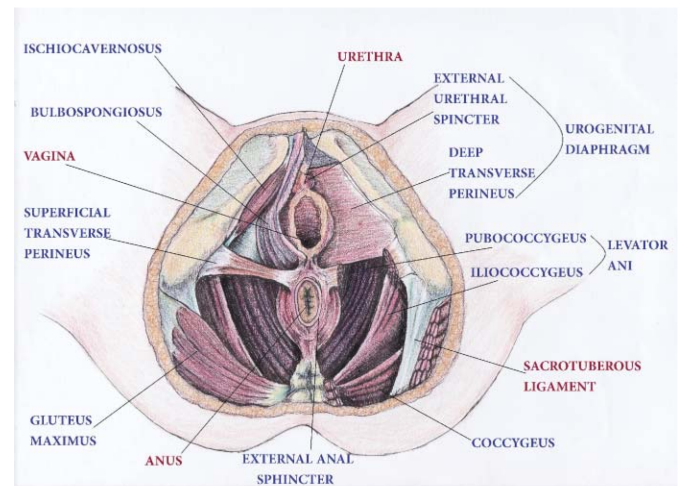

Figure 6. *Pelvic floor diagram. Drawing by Kristen Tietjen in collaboration with D. Kent, MD.*

injured, or if the fascial attachments of the posterior vaginal wall are broken (rectocele), there is downward descent of the perineal body, and a gaping hiatus results.[29] The posterior repair involves exposure of the levator ani muscles beneath the posterior vaginal mucosa. The posterior vaginal mucosa needs to be dissected free of the adhesions that form as a result of either childbearing injuries or just the aging process. The levators pull back from the midline and the fascia overlying the rectum. The levator ani muscles are plicated in the midline high to the apex of the rectocele defect (Figure 6). Excess vaginal tissue is then trimmed before repairing the vaginal mucosa.

Perineoplasty requires plication of the superficial and deep transverse perineal muscles and the bulbocavernosus muscles, as well as fibromuscular tissue in the midline between the vagina and the anus. Perineoplasty is a component of most posterior colporrhaphies for rectocele repair. Candidates for perineoplasty often have a short, thin perineal body and/or a bulging perineum and/or a rectocele that is visible without retraction of the labia.[1] Most of our patients when examined postoperatively indicate that the tightened perineum strongly contributes to the restoration of the normal vaginal contractile forces that they perceived were lacking prior to surgery (Figures 7 and 8).

Pelvic organ prolapse (POP) is the general term for an abnormal descent of the pelvic organs. These include the urethra (urethrocele), the bladder (cystocele), the uterus (uterine prolapse), the cervical stump or vaginal cuff after hysterectomy, the posterior vaginal fornix (enterocele), the anterior rectal wall/posterior vaginal wall (rectocele), and the perineum (perineocele). POP

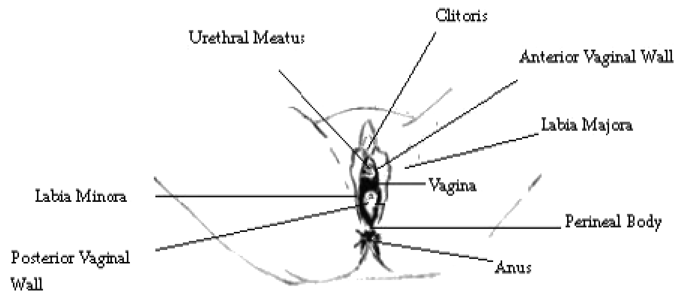

Figure 7. *Lax vagina with rectocele. Drawing by D. Kent, MD; labeling by Kristen Tietjen.*

results from damage to the pelvic support (muscle) and suspension (endopelvic fascia) system.[23] Defects are typically multiple and most commonly associated with vaginal childbirth,[30] and may produce dysfunctional voiding, dysfunctional defecation,[18] low back pain, and bulging discomfort. POP is increasing in frequency, largely because of the aging of the sizeable Baby Boomer demographic, and its management is a major topic of concern in a number of different specialties and subspecialties.[31,32] A huge industry has evolved surrounding pelvic support issues, but standardization of corrective techniques and technologies is in a very early stage.[33,34] Because POP is neither life-threatening nor disabling and because acceptable nonsurgical therapies exist, surgical candidates generally have advanced vaginal defects that no longer respond well to nonsurgical therapy. The combination of vaginal rejuvenation with surgery for advanced POP[32,35] will require further study.

A lack of published prospective controlled studies evaluating the main goals and purported results of vaginal rejuvenation procedures is evident upon review of the medical literature. A retrospective multicenter study of 341 patients undergoing a variety of cosmetic

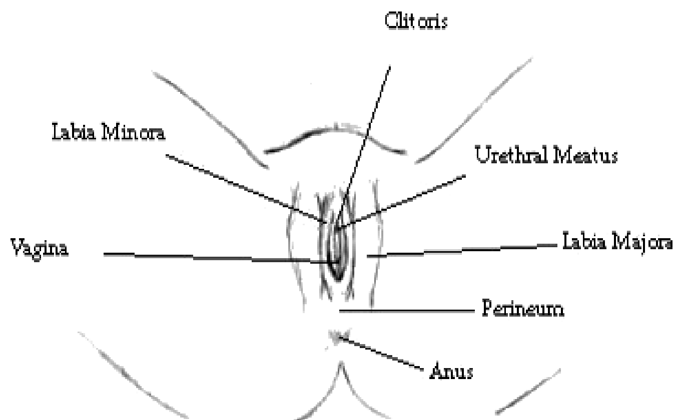

Figure 8. *Vagina after vaginal rejuvenation with normal tone and reinforced perineum. Drawing by D. Kent, MD.*

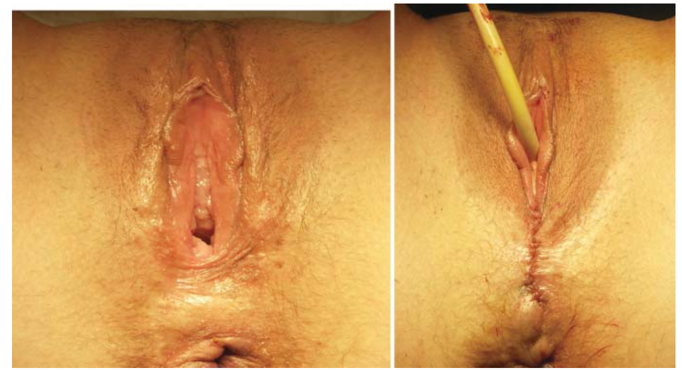

Figure 9. *Before and after photos of vaginal rejuvenation procedure. Photo courtesy of Marco Pelosi III, MD.*

vaginal procedures included 82 cases of vaginal rejuvenation surgery. The study analyzed reasons for considering surgery, preoperative sexual functioning, and patient satisfaction, as well as complications of a variety of pelvic plastic procedures. They found significant subjective enhancement in sexual functioning for both women and their sexual partners, especially in patients undergoing vaginal tightening/perineal support procedures. A total of 83% of the vaginal procedure group reported favorable outcomes, with 86.6% stating they had either a mild-moderate or significant enhancement in sexual function. A total of 16.6% of the vaginal procedure-only group reported a complication, the majority of which were problems with healing, dyspareunia (usually transient), or postop bleeding and pain (which usually resolved[19]; Figure 9).

Vaginal rejuvenation is complicated. In addition to the anatomic and medical concerns, psychosocial issues must be addressed long before surgery is considered. Body dysmorphic disorder needs to addressed. Motivations for surgery need to be explored. Insights into the specifics of how the individual achieves or fails to achieve sexual pleasure need to be gleaned. A detailed sexual, medical, and gynecological history needs to be taken in order to assess the nature of the patient's defect.[36] It has to be clear to the patient that she is choosing the vaginal rejuvenation procedure mainly for the cosmetic benefits and closure of the vaginal hiatus, and patients should be informed of the controversy over the success (or lack thereof)[37,38] of the different procedures being performed for similar complaints, and the materials and techniques being used.[39]

Conclusion

There is no doubt that there really is a need for cosmetic vaginal procedures. It truly is the last frontier,

in that surgical cosmetic procedures are performed on virtually every other part of the body. There is no reason to believe that a woman might not want her vaginal area to be beautiful and youthful in appearance.

Women want to feel sexually secure and attractive. This should not exclude the vaginal area. It is clear we are still evaluating our techniques and their results, but we are certainly entering into a new arena. As more information becomes available we will be better able to present vaginal rejuvenation to cosmetic surgeons and patients in a comprehensive manner and as a solidly based procedure that will be proven to achieve the anticipated results.

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