Original article

Total pelvic floor repair using a polypropylene mesh. Personal modification

TOMASZ KOŚCIŃSKI, JACEK SZMEJA, TOMASZ BANASIEWICZ

Department of General Surgery, University of Medical Sciences, Poznan, Poland

Abstract: The authors present their personal modification of surgical repair for a complex pelvic floor pathology. In a 58 year old woman rectal prolapse, genital organs prolapse, descending perineum, rectocele and enterocele together with left colon diverticulitis were diagnosed. Subsequent steps of the surgery were: left colectomy, hysterectomy and reconstruction of pelvic fascio-muscular structures using a polypropylene mesh. An abdomino-perineal approach was used to suture the mesh to the perineal body and to the muscles of pelvic floor. Its upper part was fixed to the presacral fascia at S1/S2 level. The rectum and the vaginal stump were anchored to this scaffold. The anatomical and functional 12-month results were excellent.

Key words: Descending perineum; Enterocele; Genital organs prolapse; Pelvic floor repair; Rectal prolapse.

INTRODUCTION

Damage to the fascio-muscular structures and innervation of the pelvic floor is responsible for rectal prolapse and intussusception, genital prolapse, impaired function of anal sphincters, troublesome defecation, urinary incontinence and descending perineum. The anatomical defects in resistant tissues can sometimes be considerable in size. A new hope for successful reconstruction of complex pelvic floor pathologies has risen with the use of prosthetic materials. Tension-free methods of implantation are believed to increase patient's satisfaction, reduce side effects and minimize recurrence rate.[1,2]

The authors present a technique of modified perineocolporectopexy using a polypropylene mesh to treat a complex pelvic floor pathology.

THE CASE

A multiparous 58 years old woman was diagnosed with rectal prolapse, prolapse of the uterus and vagina, dehiscence and weakening of the pelvic floor, rectocele and enterocele, and advanced diverticular disease of the left colon. (Figure 1). She was dependent on high doses of laxatives. She also had to help herself to evacuate the stools using her fingers. The patient was a chain cigarettes smoker and reported to have a "drinking" problem some years ago. The symptoms of rectal prolapse had lasted at least eight years before she was sent to a proctologist because of protracted rectal bleeding and soreness.

Preoperative evaluation consisted of thorough proctologic examination, defecography and pelvic MRI. Anorectal manometry and rectal endosonography were also performed.

THE SURGICAL TECHNIQUE

Preoparative osmotic bowel cleansing (Fortrans) was used, as well as prophylactic perioperative 3rd generation cephalosporin cover. The patient was operated on in lithotomy position which allowed for abdomino-perineal approach to the perineum, pelvic floor and abdominal cavity.

Laparotomy was performed through median incision. Because of disturbed colonic transit time and advanced diverticulitis of descending and sigmoid colon, left hemicolectomy with transanal stapled anastomosis (EEA 31 stapler) was performed. Then the procedure continued with the hysterectomy. In the next step, pelvic floor peritoneum was opened wide. The mesorectum was bilaterally dissected within the parietal pelvic fascia, opening the presacral space. The rectovaginal space was exposed down to the perineal body. The defects in fascio-muscular structures that resulted in formation of a giant enterocele and rectocele were identified.

During the vaginal stage of the procedure after infiltrating the mucosa with 0,9% NaCl adrenaline solution (1:200 000) an curved incision was made in the vaginal vestibula. The lower part of the rectovaginal space was opened, laterally to the medial borders of puborectalis muscles. The size of the defect in Denonvilliers' fascia was identified. The structures of perineal body were unveiled.

The prosthetic material (polypropylene mesh) was used for tension-free reconstruction of pelvic fascio-muscular structures. After the mesh was tailored to the size of the defect it was placed into the pelvic floor from "above". Next the lower border of the graft was stitched to the perineal body, the ischio-coccygeal fascia and the levators ani, using Prolene 3-0 sutures (Figure 2). The upper border was fixed to the presacral fascia and periosteum at S1/S2 level after lifting the perineum and setting it in the intermediate position. Lateral margins of the graft were sutured to pelvic parietal fascia above ureters level (Figure 3). Thus the mesh patched the defect in the rectovaginal fascia which caused the enterocele and rectocele. The prolapsing organs were anchored to this scaffolding, while the rectum was stitched through the lateral parts of the mesorectum. The posterior wall of the vaginal stump was fixed to the middle part of the mesh (Figures 4, 5).

The implanted material was separated from the peritoneal cavity by high peritoneal sutured closure. A Redon drain was left in the presacral space for 24 hours. The sur-

Figure 1. – Complex rectal and genital prolapse.

Figure 2. - Transvaginal suturing of the mesh to the perineal body and anal levators.

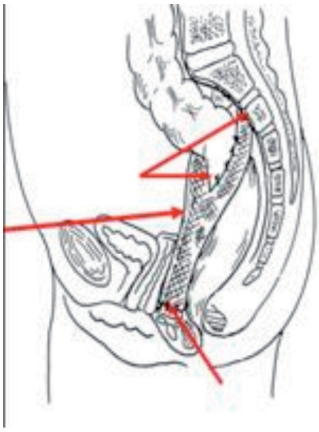

Figure 4. - Grafted mesh. Arrows indicate the fixation points: perineal body, vaginal sutures, presacral fascia, rectal sutures.

gery concluded with tight stitching and vaginal setonage. The operation time was 150 min. The blood loss has been minimal.

This surgical procedure can be seen in a video enclosed in the paper.

DISCUSSION

A high failure rate is observed in patients where important supportive pelvic structures were markedly thinned or atrophic, thus their reconstruction was temporary if not impossible at all.[3-5] Introduction of prosthetic materials into pelvic floor repair surgery brings forth a new quality. Weak natural tissue may be replaced, and large anatomical defects are filled with properly implanted meshes resulting in a tension-free effect. Prosthesis can also be used as a frame to which the prolapsing pelvic organs can be attached.

The authors present a modified method of perineocolporectopexy using a polypropylene mesh. The assumption was that the key of a successful surgical result would be achieved through a good access to the pelvic floor structures in order to reveal all the defects and enable implantation of the mesh to valuable anatomical parts. This was the reason of the abdomino-perineal approach which allowed to obtain an effective suspension of the pelvic floor preventing further perineal descent and anchoring the prolapsing rectum and vagina.

CONCLUSIONS

The tolerance of implanted mesh has been good. There was no evidence of local sepsis neither mesh erosion. The anatomical and functional effects were excellent at 12 month follow-up.

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This surgical procedure can be seen in a video. Link to <http://bit.ly/1ackJt3.

Correspondence to:

Tomasz Kościński - 49 Przybyszewski street
Poznań 60-355 - Poland
E-mail: tomaszkoscinski.proktolog@op.pl

Figure 3. - Lateral mesh fixation to the parietal pelvic fascia.

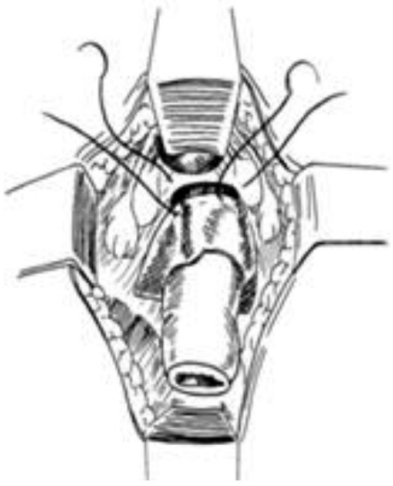

Figure 5. - Anchoring of vaginal stump to the mesh.

Radiofrequency resurfacing and revision of deepithelialized labia minora labiaplasty: review of literature and case study

RED ALINSOD
Urogynecology Director, The Women's Center and The Laguna Laser Center, South Coast, CA

Abstract: The growing demand for Aesthetic Vulvo-vaginal Surgery (AVS), particularly elective and therapeutic labia minora plasty (labia minora reduction) procedures, has increased the risk of failed labiaplasties when performed by inexperienced or poorly trained surgeons. Inadequate labia minora reduction surgery may result in medical and functional complications as well as aesthetically unattractive results. Complications of a botched labiaplasty include bleeding, infection, delayed wound healing, iatrogenic asymmetry, and under or overcorrection. This case report illustrates the use of an innovative radiosurgical technique to repair poor anatomical outcomes of an unsuccessful de-epithilialized labia minora plasty. Revision surgery was achieved using a radiofrequency device that allows incision, micro-smooth cutting, and resurfacing of the vulva-vaginal region, including the labia minora and clitoral hood. Radiofrequency was found to be an effective tool for ironing rough surfaces, smoothing uneven edges, excising hypertrophic labial tissue, and sealing small blood vessels in a labia minora plasty revision surgery.

Key words: Labia minora plasty; Radiofrequency; Aesthetic vulvo-vaginal surgery (AVS); Female genital cosmetic surgery (FGCS); Clitoral hood reduction.

INTRODUCTION

Enlarged or irregular labia minora associated with chronic irritation, other physical discomfort, or an unsightly aesthetic appearance is a growing complaint of women seeking surgical treatment from gynecologic surgeons or cosmetic surgeons.[1] Labia minora (labia) plasty is the term for several female cosmetic genital surgical techniques to reduce the size and in some cases to alter the shape of hypertrophic, asymmetric, or protruding labia minora for aesthetic or functional purposes.[1-2] Standard techniques for the reduction and reshaping of the labia minora include curved linear excision or simple amputation,[3-4] central wedge resection,[5] de-epithelialization,[6] W-shaped labial resection (zigzag technique),[7-8] and laser labiaplasty in which a laser is used in place of a scalpel.[1] More recently, radiofrequency labiaplasty has been found to be beneficial due to its precision and safety in the clitoral area.[9] In a small case series, posterior wedge resection was found to be an effective technique for aesthetic labiaplasty.[10] Deepithelialized labiaplasty recently has gained popularity because of its purported safety combined with its ability to preserve the natural free edges and neurovascular supply of the labia minora.[1]

A combination of labia minora plasty techniques, including 5-flap Z-plasty, reportedly can produce optimal surgical outcomes for labia minora reduction, depending upon the patient's individual needs.[1] Labia minora plasty procedures are minimally invasive surgeries that do not typically lead to significant surgery-related complications.[3] However, there is a risk for serious adverse effects resulting from labia minora reduction procedures if a surgeon is not adequately trained and experienced in Aesthetic Vulvo-vaginal Surgery (AVS). Complications of labiaplasty such as bleeding, infection, iatrogenic asymmetry, poor wound healing, and either under or overcorrection may require medical intervention, revision surgery, or both.[1]

In this case report we describe an innovative surgical technique involving the use of monopolar high frequency radiofrequency (RF) energy for revision of labia minora labiaplasty. The patient was a 32 year-old Caucasian gravida 3, Para 2 female who had undergone a labia minora labiaplasty under general anesthesia in a plastic surgeon's office surgery center before consulting our office. The surgeon claimed to have previously performed vaginal cosmetic procedures, but provided no credentials or photographic documentation of expertise in labiaplasty.

Approximately two weeks after her surgery, the patient noticed holes in what appeared to be "de-epithelialized" areas of the labia. Seeking a "Barbie Appearance" to correct an unsatisfactory surgery, the patient requested a consultation one month after her operation and then sent our office photos of the postoperative results. The "Barbie Look" is a colloquial term for external genitalia characterized by either no or only minimal labia minora tissue that extend beyond the labia majora. The vertical vaginal orifice appears simply as a fine line. The patient was advised to postpone an appointment with our office until two months after surgery to allow maximum time for normal wound healing. When no improvement occurred, she visited our office one month after initially contacting us. Her operative report suggested that the plastic surgeon had performed a de-epitheliazation labiaplasty in which strips of skin were removed from both sides of the labia minora. An inverted U clitoral hood reduction was also performed with the labia minora labiaplasty (Figure 1).

Figure 1. – After de-epithelialization labiaplasty. Following botched de-epithelialization labiaplasty the minora reveal rough elevations, uneven edges, and large flaps of skin connecting minora and majora.

Figure 2. – Pre-op revision. Front view pre-op revision shows protrusion of minora beyond majora, with the clitoral hood topped by a hardened painful scar. Multiple holes are present.

Figure 3. – Immediately after resurfacing revision. Immediately post-op revision shows that excess labial tissue has been trimmed from minora, edges evened, and clitoral hood prominence reduced with radiofrequency surgical technique of "flathering".

Figure 4. – Post Op 3 Years. Resculptured labia minora at Post Op 3 years remain fully healed and aesthetically attractive with no hypertrophy, asymmetry, holes or rough surfaces.

CASE REPORT

Our pelvic exam revealed that the patient's minora was connected to the majora via unattractive flaps of labial tissue with strands of skin. A painful firm scar was observed on top of the clitoral hood. The labia showed rough, bumpy and irregular areas, uneven edges, and an asymmetric pattern that was more pronounced in the postoperative physical exam than in the pre-operative photos (Figure 2). The blood supply had been compromised, thus preventing full healing at the labial edges. Since the labia minora is usually thin, removal of strips of skin on the medial or lateral side can leave an extremely narrow strip of tissue with vasculature that subsequently easily becomes impaired. This defect can result in holes appearing in the de-epithelialized segments.[9] Additionally, clitoral hood reductions performed on the anterior surface of the clitoral hood can form thickened and painful scars. A scar may appear unsightly as a pale but visible and palbable firm strand traversing the surface of the clitoral hood.

The patient requested a revision surgery to achieve a Barbie Look and signed the appropriate consent form. The Surgitron® Dual RF™ S5 with Pellevé™ equipped with a handpiece (Radiowave technology, Ellman International, Oceanside, NY, USA) was used to perform sutureless RF labial resurfacing and revision in our in-office surgical suite. The patient was administered a topical and local anesthetic but no I.V. In lieu of conventional scalpel-based ablation, RF was utilized initially for excisional surgery to excise labial tissue that had detached from the vulva. The labial surface and edges were then resurfaced with RF to smooth and refine the tissue. A "feathering" techique was used in which multiple passes were made with the device until the desired smoothness and tissue shrinkage was achieved.[9] Injured vasculature in labial tissue were coagulated with the Surgitron to seal small blood vessels. Finally, the thickened tender scar resulting from the clitoral hood reduction was resurfaced with RF (Figure 3). The patient achieved a full recovery within 8 weeks postoperative at which time she was able to have normal sexual relations (Figure 4). She expressed complete satisfaction with the results of the revision labiaplasty and remained satisfied at 3-year follow up.

COMMENT

The RF applications described in this case report include excisional labiaplasty techniques and the RF Pelleve procedure to correct the poor clinical outcomes of the patient's previous de-epithelialized labiaplasty. RF permitted maximum smoothing of the edges of each labium minora to improve their aesthetic appearance while also decreasing labial bulkiness by shrinking the bumpy areas. Compared to lower frequency electrosurgery instruments, monopolar RF treatment is associated with decreased tissue resistance and maximum control in precision cutting as well as tissue tightening to smooth wrinkled skin.[9] This technique is appropriate for corrective labiaplasty cases requiring delicate and meticulous repair of labial tissue and vasculature.

The versatility of radiosurgery with its detachable handpiece hair wire tips allows it to function in a multimodal capacity as an electrosection instrument for incision, microsmooth cutting, resurfacing, and vascular repair. The individual variability of small blood vessels in the labia minora poses a challenge for restoration of function to damaged vasculature. However, the Surgitron enables precise microsurgical manipulation required to seal off open small blood vessels with minimal lateral thermal damage of 20-40 microns.[9] By stimulating coagulation, the attachable ball electrode tips of the device promote soft tissue shrinkage and skin tightening. Monopolar RF surgery has been associated with less thermal destruction, thereby reducing burning or charring during techniques to excise or smooth vulvar skin.[9]

CONCLUSION

Revision of de-epithelialized labia minora labiaplasty utilizing RF is beneficial for the reversal or at least mitigation of poor postoperative results due to suboptimal healing in prior surgery. RF labiaplasty is a promising cutting-edge surgical technique for initial labiaplasty as well as for revi-

sion procedures of the female external genitalia.[11] The efficiency and effectiveness of radiosurgery in treating all of the adverse outcomes of the patient's previous "botched procedure" suggest that this device may be highly advantageous for revision labiaplasty requiring incision, resection, resurfacing, skin tightening, and/or small blood vessel repair. Future case series to further investigate the safety and efficacy of RF for revision surgery of failed de-epithelialized labia minora labiaplasty are warranted.

NOTES

Statement of Informed Consent.

A signed statement of informed consent was obtained from the patient to publish medical information pertinent to the case study as well as the photographs relating to her procedure.

Ethical approval: Not required.

Funding: None.

Conflict of Interest Statement.

Red Alinsod, M.D. has previously received financial support from Ellman International, Inc. for an assessment of other clinical research on the use of radiofrequency in Aesthetic Vulvo-vaginal Surgery.

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Correspondence to:

Email: red@urogyn.org

Multidisciplinary Uro-Gyne-Procto Editorial Comment

To improve the integration among the three segments of the pelvic floor, some of the articles published in **Pelviperineology** are commented on by **Urologists**, **Gynecologists**, **Proctologists/Colo Rectal Surgeons** or **other Specialists** with their critical opinion and a teaching purpose. Differences, similarities and possible relationships between the data presented and what is known in the three or more fields of competence are stressed, or the absence of any analogy is indicated. The discussion is not a peer review, it concerns concepts, ideas, theories, not the methodology of the presentation.

Procto... Doctor Alinsod is a Urogynecologist and his paper describes a surgical approach to aesthetic problems affecting the vulvo-vaginal area of some women who are inadequately treated by inexperienced or poorly trained surgeons. For many reasons, mostly cultural, the number of these procedures apparently is growing all over the world with needs that often seem to be quite different or even contradictory conforming the different cultures. Aesthetic problems of the perineal region obviously may involve also the anal and perianal area, and this applies to both sexes. Men and women may require plastic or aesthetic surgery at the anal level either for a purely aesthetic reasons or for a functional problem as well, or both. The condition can be congenital, iatrogenic, or the result of some diseases, or finally it can derive from a normal evolution due to aging.

An ectropion of the rectal mucosa is sometimes seen after operations for rectal atresia or imperforated anus or an inadequate hemorrhoidectomy. In these cases the patient may also complain a more or less severe fecal incontinence. The Saraffof's operation is an interesting but poorly known procedure for the correction of the anal mucosal ectropion. Operations for anal fistula sometimes leave disfiguring scars, as well as severe perineal trauma or suppurative hydrosadenitis, all these eventually requiring plastic surgery with flaps or other procedures. Flaps are also indicated in severe anal strictures. Skin tags of various size are observed in most adults and they are usually asymptomatic, so they do not need to be removed. They may be the consequence of a healed anal fissure or of a reabsorbed perianal hematoma as frequently seen after the vaginal delivery. Some women, and less often some men, however are bothered by the skin tags either for local hygiene reasons or for cosmetic reasons during their sexual activity. Skin tags are easily removed under local anesthesia with a relatively painful recovery. The operations aiming to improve both the appearance and mostly the function of the anal area are not easy, and good results are not the rule, so they must be performed by experienced colorectal surgeons. Skin tags removal is safe and easily done with diathermy or excision and a reabsorbable suture, leaving skin bridges to avoid a complete circular scar. The patient though has to be warned that the recurrence is possible. Histology of the removed tissue is always mandatory.

GIUSEPPE DODI
Colorectal Surgeon, University of Padova, Italy
giuseppe.dodi@unipd.it

Aesthetics... Common interesting indications involving the intervention of plastic surgeons and/or dermatologists in the anal region are represented by skin hyperpigmentation and hair removal, both involved in achieving the so called "anal whitening".

For anal skin spots removal the first mandatory step consists in the dermatoscopical examination. Along with a careful history, dermoscopy can contribute to distinguish an hyperpigmentation due to epidermal accumulation of melanin (e.g. postinflammatory, frictional, etc), from melanocytes accumulations (nevi of different types) in the dermo-epidermal compartments. Whereas the latter requires a surgical excision in order to perform a proper histological examination, the former could be conveniently removed by the use of a Q-switched laser with a wavelenght of 532 nm. This device emits pulses characterized by a very high power level and a very short emission time (nanoseconds). The specific target of this laser is represented by cells containing high concentration of melanin. With a single treatment, these cells could be selectively destroyed, leaving a very superficial crust which spontaneously detaches in 7-10 days. A specific learning curve is necessary to capitalize on the selectivity of the Q-switched laser, thus avoiding possible side effects such as skin burns.

Definitive results for anal hair removal can be obtained by the use of two different devices: the Intense Pulsed Light and the long-pulse 1064 nm Neodimio-Yag laser. It is advisable to use the former in lighter skinned and the latter in darker skinned patients. The target of these pulses is represented by melanin contained into the hair follicle. Each treatment allows the removal of the 20% of the hair and must be performed at least 40 days after the previous session.

LUCA SILIPRANDI
Aesthetic Plastic Surgeon, Padova, Italy
l.siliprandi@clinicacittagiardino.it