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ORIGINAL ARTICLE GENITAL SURGERY

G-Spotplasty: A New Surgical Plastic Intervention—The Preliminary Study

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Abstract
Background Ostrzenski's G-pot anatomical structure discovery has been verified by the anatomy, histology, MRI in vivo, and electrovaginography in vivo studies. The objectives of this scientific-clinical investigation were to develop a new surgical reconstructive intervention (G-spotplasty); to determine the ability of G-spotplasty surgical implementation; to observe for potential complications; and to gather initial information on whether G-spotplasty improves female sexual activity, sexual behaviors, and sexual concerns.
Methods A case series study was designed and conducted with 5-year follow-up (October 2013 and October 2017). The rehearsal of new G-spotplasty was performed on fresh female cadavers. Three consecutive live women constituted this clinical study population, and they were subjected to the newly developed G-spotplasty procedure in October 2013. Preoperatively and postoperatively, a validated, self-completion instrument of Sexual Relationships and Activities Questionnaire (SRA-Q) was used to measure female sexual activity, sexual behaviors, and sexual concerns.
Results Three out of twelve women met inclusion criteria and were incorporated into this study. All patients were subjected to G-spotplasty, completed 5-year follow-up, and returned completed SRA-Q in a sealed envelope. New G-spotplasty was successfully implemented without surgical difficulty and without complications. All patients reported re-establishing vaginal orgasms with different degrees of difficulties, observing return of anterior vaginal wall engorgement, and were very pleased with the outcome of G-spotplasty.
Conclusions The G-spotplasty is a simple surgical intervention, easy to implement, and improves sexual activities, sexual behaviors, and sexual concerns. The preliminary results are very promising and paved the way for additional clinical-scientific research.
Level of Evidence IV This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.

Keywords G-spot · G-spotplasty · G-spot dysfunction · G-spot therapy · Female orgasm · Female sexual response cycle

Introduction

Through the centuries, women reported vaginal engorgement and high erotic sensitivity located in the anterior distal vaginal wall during the sexual stimulation, and the survey study confirmed such phenomenon being reported in 84% by women [1, 2]. The electrovaginogram in vivo study conducted by Shafic et al. documented the presence of a "pacemaker" located within the anterior distal vaginal wall. Those authors also established that rising vaginal pressure in the anterior vaginal wall increased the intensity of the pacemaker activities leading to vaginal muscle contraction. At the same time, the authors observed engorging of the anterior vaginal wall. "The vaginal pacemaker seems to represent the G-spot, which seems to be a small area of erotic sensitivity in the vagina" [3].

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Increasing blood flow within the vaginal wall during sexual arousal was also reported in the medical literature [4].

The anterior vaginal engorgement during sexual excitement was generally accepted by clinicians without knowledge of what anatomical structure was responsible for this phenomenon [5]. In September 2011, Ostrzenski discovered the G-spot anatomical structure existence and published this historic finding in April 2012, Fig. 1, [6]. The International Study Group on the G-spot verified the G-spot anatomical existence and discovered characteristic microscopic features that distinguish the G-spot from the vaginal wall and published these data in 2014 [7]. Ostrzenski, in another study on fresh female cadavers, determined the anatomical role of the G-spot in the anterior vaginal enlargement process and also documented the potential risk of severe complications relating to injections of artificial or natural fillers into the anterior distal vaginal wall [8]. Recently, Maratos et al. in their MRI in vivo study verified statistically significant occurrences of the G-spot anatomical structures [9]. Shafic et al. documented the presence of the low-voltage electrical waves produced by the G-spot (a pacemaker) located in the anterior distal vaginal wall [3]. The marketing literature provides sketchy information that collagen injections to the anterior vaginal wall improve G-spot function. A collagen injection method was adopted from a traditional treatment for urethral intrinsic sphincter deficiency. Anecdotally, collagen injections supposedly improved sexual function in women; however, there is no well-designed scientific-clinical study to support such a claim.

The primary objective of this study was to develop a new surgical intervention of G-spotplasty. The secondary objectives were to observe potential intraoperative and postoperative complications as well as to determine whether G-spotplasty improves the intimate life of women.

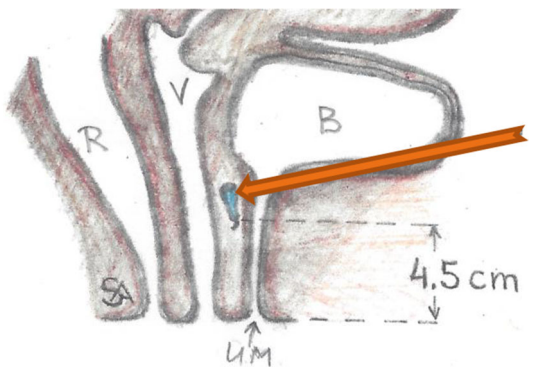

Fig. 1 G-spot location is depicted within the anterior distal vaginal wall (the brown arrow). BVR indicates the bladder, the vagina, the rectum. UM stands for the urethral meatus. The mean location of the G-spot is 4.5 ± 2.0 cm below the UM

Materials and Methods

In June 2012, the newly developed G-spotplasty surgical concept was practiced on fresh female cadavers at the Department of Forensic Medicine, Warsaw Medical University, Poland. A prospective case series study was designed and conducted on live women between October 2013 and October 2017. Recruitment for the current study and actual surgeries was conducted at the Institute of Gynecology, Inc. St. Petersburg, Florida, USA. The new G-spotplasty surgical intervention was executed on live women in October 2013, and follow-up was conducted for 5 years. The findings from study-enrolled subjects were collected prospectively and analyzed retrospectively.

The study protocol was presented to all subjects, and it was explained that this new surgical intervention has never been performed on live patients and only rehearsals were conducted on fresh female human cadavers. G-spotplasty surgical intervention was fully explained, and all subjects' questions were answered. The Bioethics Committee of Warsaw Medical University, Poland, approved both protocols of the studies (anatomical dissection, rehearsal of G-spotplasty, and clinical investigation [AKBE 146/12]). All women accepted the study protocol and signed informed consents that were presented in writing to them.

During the study, the following data were planned to record: intraoperative short-, long-term postoperative complications: estimated blood loss, hematoma formation, infection, wound separation, and unexpected adverse reactions. Also, identification of neighboring anatomical structures and access to the surgical field were assessed. Preoperatively, the validated instrument of Sexual Relationships and Activities Questionnaire (SRA-Q) was used to determine sexual activity, sexual behaviors, and sexual concerns. The female SRA-Q has been described on April 16, 2012, in detail and is available electronically (the last visit, 11-28-2016): www.elsaproject.ac.uk/uploads/elsa/…/self_completion_sexual_function_female.pdf.

The SRA-Q was administered in the form of a self-completion questionnaire consisting of 30 questions relating to female sexual relationships and activities. Postoperatively, the SRA-Q was utilized to establish the preliminary results of the G-spotplasty procedure on sexual activity, sexual behavior, and potential resolution of sexual concerns.

Inclusion and Exclusion Criteria

Those women who reported reduced sexual activity; difficulty in achieving vaginal orgasm, but experienced vaginal orgasms during vaginal sexual intercourse before and field conservative therapy for sexual dysfunction were included

into the study. Altogether, twelve women were recruited, and nine of them were excluded from this study. Four patients reported a history of anterior vaginal reconstructive surgeries. Three subjects could not make long-lasting commitments for follow-ups due to geographic location. One subject had not engaged herself with vaginal sexual intercourse for the last 6 weeks. One patient did not receive conservative therapy for sexual dysfunction.

Case 1

A 32-year-old, healthy, G_1P_{1001} Latino woman was delivered by Cesarean section for failure to progress in labor at the age of 26. She became self-conscious of decreasing sexual sensation of the anterior distal vaginal wall either to manual stimulation or during vaginal heterosexual intercourse, diminished vaginal engorgement, and lost ability to reach vaginal orgasm that she enjoyed before childbirth. She received multiple oxytocin injections to the anterior vaginal wall by a sexual therapist. This mode of therapy improved her condition; however, it requires frequent re-injections. The patient was subjected to G-spotplasty.

Case 2

A 36-year-old, healthy, G_1P_{1001} Caucasian women had a natural vaginal delivery with lateral episiotomy and episiorrhaphy at the age of 23. Shortly after childbirth, she noticed inability to reach vaginal orgasm, decreased sensation of the anterior distal vaginal wall during vaginal stimulation, and diminished vaginal engorgement during sexual arousal. She failed multiple conservative treatments offered by sexual therapists. The patient was subjected to G-spotplasty.

Case 3

A 42-year-old, healthy, G_3P_{3003}, Caucasian woman delivered three children vaginally. At the age of 29, she gave birth to the third child, and the delivery was complicated by vaginal and posterior peritoneum third-degree rupture. After the last childbirth, she lost her responsiveness to stimulation of the anterior vaginal wall, diminished vaginal engorgement, and she could not reach vaginal orgasm (before the last vaginal delivery, she was able to reach vaginal orgasms), and she also reported feeling a sensation of a wide/smooth vagina during vaginal sexual intercourse. Her gynecologic surgeon performed "vaginal tightening" by means of posterior vaginal wall partial resection and partial resection of the posterior perineum. A vaginal tightening procedure did not re-establish her ability to reach vaginal orgasm, and the "vaginal tightening" procedure created severe superficial dyspareunia. Consequently, she underwent G-spotplasty.

The duration of the G-spotplasty procedure was recorded from the beginning of the local anesthesia infiltration to the end of the procedure. For measuring postoperative pain, each subject utilized a numeric evaluation system from 0 to 10 (0 was no pain and 10 were unbearable pain).

Local Anesthesia

One hour before the vaginal mucosa incision, a Prilocaine and Lidocaine (25:25%) cream was applied on the surface of the anterior vaginal wall. Thirty minutes before surgery, each subject took orally 2.5–5 mg Valium and inserted rectally Phenergan 12.5 mg suppository. Shortly before the incision, bupivacaine HCl 0.5% with epinephrine 1: 200,000 was used for local infiltrations. On average, 7.5 mL was injected into the operative field.

Step-by-Step Surgical Intervention

In the office procedure room, subjects were placed in the dorsal lithotomy position, and vulvo-vaginal areas were prepped with an antiseptic cleanser of chlorhexidine gluconate 4% solution. A Foley catheter (no. 12) was placed into the urinary bladder and drained to gravity during the procedure. The catheter was removed at the completion of the G-spotplasty operation. Patients were draped with sterile covers. The surgical procedure was executed in the predetermined, successive step-by-step manner of all the most important principles of the G-spotplasty operation.

After placing a vaginal speculum posterior blade into the vaginal canal to assist in exposing the anterior distal vaginal wall (Fig. 2a, b), the extent of the vaginal laxity is estimated by pressing the vaginal wall with a ring forceps

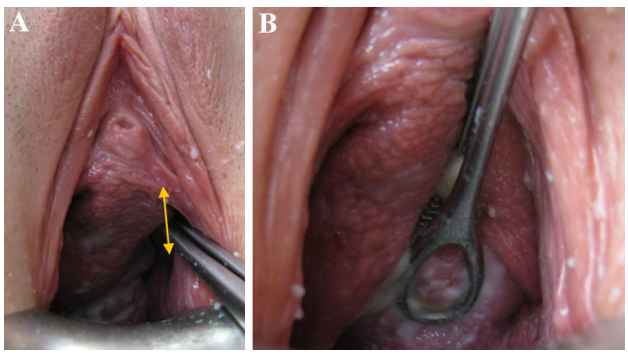

Fig. 2 Intraoperative evaluation of the anterior distal vaginal wall is presented. **a** The yellow arrow indicates vaginal wall incision. **b** Compressing the anterior distal vaginal wall with a ring forceps assists in determining the extent of vaginal laxity

(Fig. 2b). This maneuver helps in determining the approximate amount of surgical fascia (the anterior vaginal wall adventitia) tissue to be excised (Fig. 2b). The intraoperative evaluation of the anterior distal vaginal wall for establishing the incision line is conducted (Fig. 2a). Compressing the anterior distal vaginal wall with a ring forceps assists in determining the extent of excision (Fig. 2b).

The incision line is established 2.5 cm below the urethral meatus and continues approximately 5 cm downwards, and 1.5 cm aside from the lateral urethral wall. The diamond-shaped vaginal wall incision is made with a number 10- or 15-surgical scalpel blade. The incision is carried down through the submucosal and muscular layers of the vaginal wall until the vaginal surgical fascial tissue is exposed (whitish in color) (Figs. 3, 4 and 5). Separating the vaginal muscular layer from the surgical fascia (whitish color) is executed sharply (Fig. 5). The vaginal surgical fascia was also excised in a diamond shape using a number 11-surgical scalpel blade (Fig. 6). The surgical fascial edges were approximated with simple interrupted, 1-0 delayed absorbable sutures on a small sharp needle (Fig. 7). The remaining vaginal walls were closed with simple interrupted, 3-0 delayed absorbable sutures on a small tapered needle (Fig. 8).

The timing of the G-spotplasty procedure was recorded from the initial incision to the end of the procedure. Estimated blood loss was evaluated from the blood amount being collected in a container. For measuring postoperative pain, each subject utilized a 0–10 numeric scale system (0 was no pain and 10 were unbearable pain).

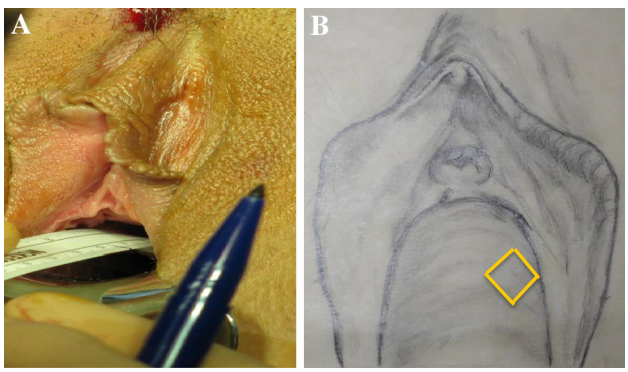

Fig. 3 Marking vaginal mucosa for incision. **a** Establishing the location for the diamond-shaped incision on the anterior distal vaginal wall. **b** The diamond-shaped incision marked with yellow color lines

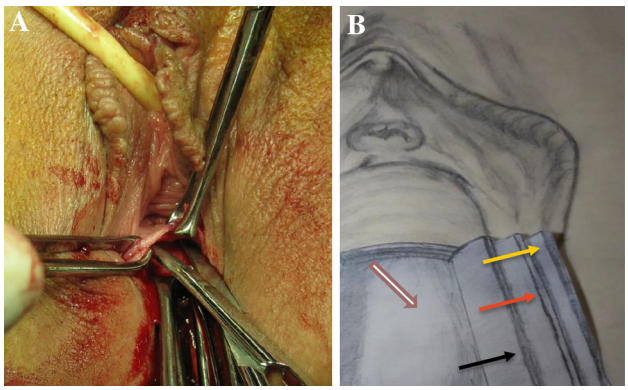

Fig. 4 Separating the vaginal wall just above the vaginal surgical fascia. **a** After making a diamond-shaped incision, the vaginal wall was separated just above the vaginal adventitia. **b** The vaginal wall layers are presented as follows: the yellow arrow indicates the vaginal mucosa and submucosal stratum. The red arrow points to the muscular layer (circular and longitudinal muscles). The black arrow depicts the vaginal adventitia (surgical fascia), which is resting on the urinary bladder (the brown/white arrow)

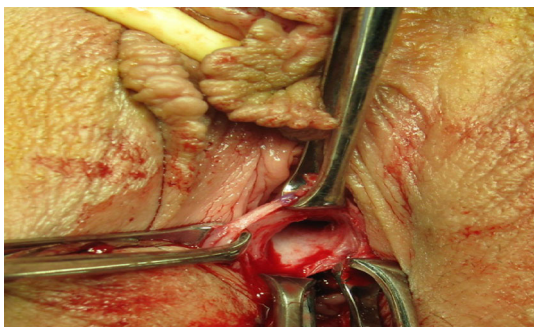

Fig. 5 Vaginal surgical fascia (whitish color) superior surface is separated from the remaining vaginal wall layers

Results

The clinical study population consists of three live women, and all women were sexually active in the past month prior the enrollment. The new G-spotplasty surgical intervention was implemented successfully without difficulty and without complications. All subjects returned the self-completion SRA-Q pre- and postoperatively. The follow-ups were conducted for as long as 5 years. Preoperatively, all subjects reported reduced sexual activity, and none of these subjects was able to reach vaginal orgasms (Table 1). Postoperatively, the SRA-Q determined re-established ability to reach vaginal orgasm with different degrees of difficulties and increasing frequency of sexual vaginal intercourse as well as reduced frequency of masturbation following the G-spotplasty procedure (Table 2). All patients reported the re-established ability to reach vaginal orgasm, observed and reported more accentuated anterior

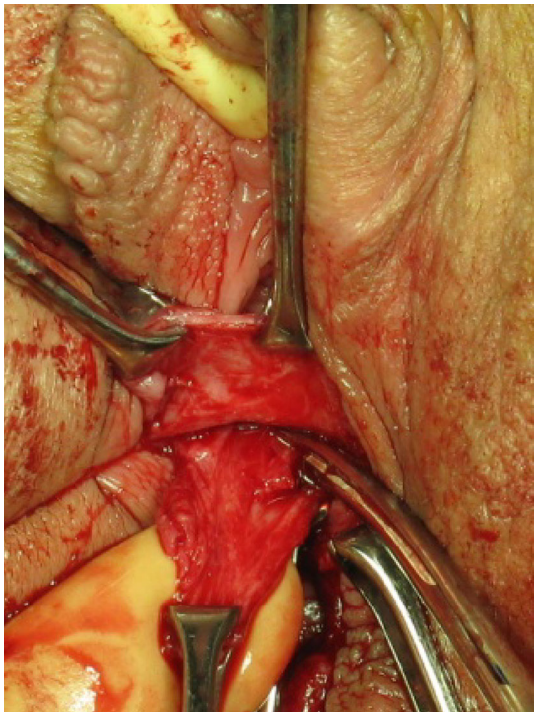

Fig. 6 Excising a diamond shape of the vaginal surgical fascia

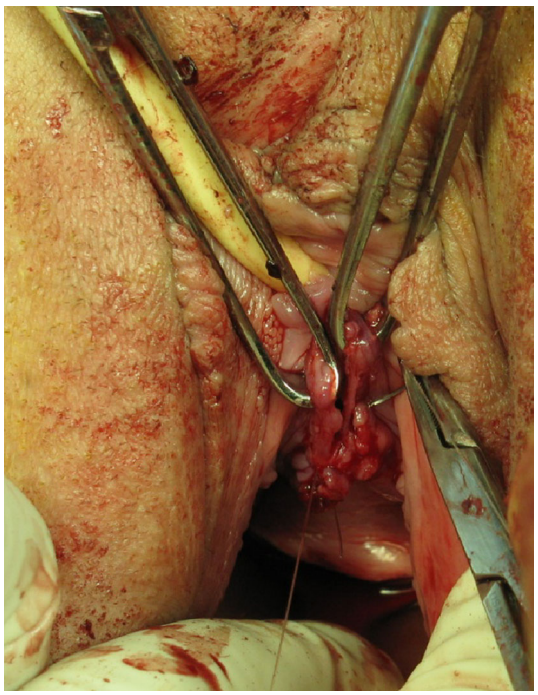

Fig. 7 Reconstructing the vaginal wall above the vaginal surgical fascia

vaginal wall engorgement when compared to the preoperative observations, and improved intimate life.

At the sixth postoperative week, case 1 resumed her intimate vaginal sexual life and continued throughout the five-year follow-up. She reported great improvement in her sexual responsiveness to stimulation of the anterior distal vaginal wall. She also was able to reach vaginal orgasm (Tables 1 and 2).

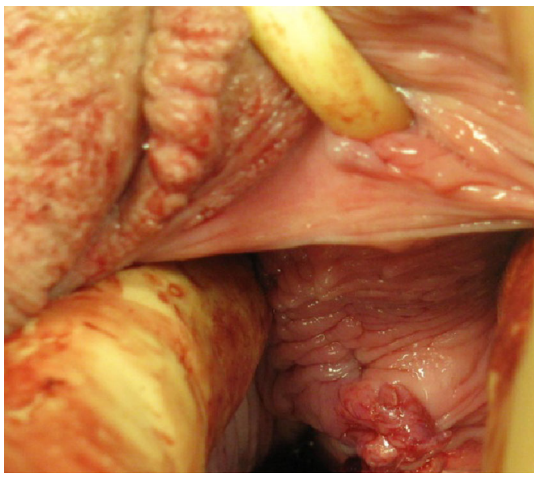

Fig. 8 Folded vaginal wall (lighter in color) after G-spotplasty completion

Case 2 resumed her intimate sexual life also at 6 weeks after surgery. Postoperatively, she took acetaminophen for pain that she estimated to be at the level of 2–3 on the numeric pain scale. She reported re-established ability to reach vaginal orgasm and visible improvement of anterior vaginal wall engorgement.

Case 3 resumed her intimate sexual vaginal life 6 weeks after G-spotplasty. Postoperatively, she took acetaminophen as needed for minimal pain (level 3 on the numeric pain scale). She was able to feel improved sensation of the anterior vagina, observed the presence of anterior vaginal engorgement, and was able to reach vaginal orgasm.

G-spotplasty was executed without intraoperative complications, and the average estimated blood loss was 48 cc. The postoperative period was uneventful in all cases. The G-spotplasty surgery lasted 47 min in case number 1; in case 2, the procedure lasted 38 min; and 29 min in case 3. On average, G-spotplasty lasted 37 min.

Discussion

This study determined that G-spotplasty is a simple reconstructive procedure and can be executed effortlessly. Successive steps of the all-important principles of the new G-spotplasty operation were established during the rehearsal on fresh female human cadavers. This preliminary study established that increasing tension within the anterior distal vaginal wall can serve as a therapeutic tool for G-spot dysfunction. The present clinical investigation

Table 1 Preoperative analysis of the selective sexual data from the SRA-Q

Past month	Case 1 (32-year-old)	Case 2 (36-year-old)	Case 3 (44-year-old)
Sexual Drive(SRA-Q # 2)	More than once a day (7)	More than once a day (7)	Once a day (6)
Sexual Arousal(SRA-Q # 12)	Almost always aroused (6)	Almost always aroused (6)	Almost always aroused (6)
Masturbation(SRA-Q # 8)	Once in the past month (2)	Not at all (1)	Not at all (1)
Vaginal Intercourse(SRA-Q # 6)	More than once a day (7)	Once a day (6)	2 or 3 times a week (5)
Vaginal Orgasm(SRA-Q # 18)	Slightly difficult to reach (4)	Very difficult to reach (2)	Moderately difficult to reach (3)

SRA-Q #

() = the number of question from SRA-Q

Table 2 Pre-, postoperative analysis of the selective sexual data from the SRA-Q

SRA-Q Evaluation	Past month	Case 1 (32-year-old)	Case 2 (36-year-old)	Case 3 (44-year-old)
Preoperative	Sexual Drive (SRA-Q # 2)	More than once a day (7)	Once a day (6)	2 or 3 times a week (5)
Postoperative	Sexual Drive (SRA-Q # 2)	More than once a day (7)	More than once a day (7)	Once a day (6)
Preoperative	Sexual Arousal (SRA-Q # 12)	Almost always aroused	Almost always aroused (6)	Almost always aroused (6)
Postoperative	Sexual Arousal (SRA-Q # 12)	Almost always aroused (6)	Almost always aroused (6)	Almost always aroused (6)
Preoperative	Masturbation (SRA-Q # 8)	More than once a day (7)	Once a day (6)	2 or 3 times a week (5)
Postoperative	Masturbation (SRA-Q # 8)	Once in the past month (2)	Not at all (1)	Not at all (1)
Preoperative	Vaginal Intercourse (SRA-Q # 6)	Once a day (6)	2 or 3 times a week (5)	2 or 3 times a week (5)
Postoperative	Vaginal Intercourse (SRA-Q # 6)	More than once a day (7)	Once a day (6)	2 or 3 times a week (5)
Preoperative	Vaginal Orgasm (SRA-Q # 18)	Impossible (1)	Impossible (1)	Impossible (1)
Postoperative	Vaginal Orgasm (SRA-Q # 18)	Slightly difficult to reach (4)	Very difficult to reach (2)	Moderately difficult to reach (3)

SRA-Q # = Sexual Relationships and Activities Questionnaire

() = the question number from SRA-Q

also documented that the newly developed G-spotplasty improved female sexual function, sexual behavior, and ability to reach vaginal orgasms.

In 1998, Goldstein and Berman reported that vaginal engorgement dysfunction can be associated with a vasculogenic origin [10]. The International Group Study on the G-pot established that microscopic characteristics of the G-spot consisted of vessels and nerves; therefore, either vascular or nerve abnormal conditions, or both can cause G-spot dysfunction [7]. Additionally, determining the histological existence of a nerve ganglion within the G-spot was the historic discovery and considered as the G-spot diagnostic landmark, because a nerve ganglion has never been identified within the vaginal wall [7, 11]. Ostrzenski, in another clinical-scientific study, established the anatomical role of the G-spot in anterior distal vaginal wall enlargement [8]. The current study also incorporated the results presented by Shafic et al., who determined that rising pressure in the area of the anterior vaginal wall increased the intensity of the electrical vaginal activities originating from the "pacemaker" (G-spot) [3]. The findings of Shafic et al. were taken into account in the process of developing the G-spotplasty surgical concept, particularly the finding that increasing anterior vaginal wall pressure increased G-spot electrical intensity [3]. Based upon the findings of Shafic et al., the author of this study concluded that reducing vaginal wall laxity can improve G-spot function [3].

There are varieties of excision types that can be utilized in the G-spotplasty. Diamond-shaped, elliptical, and circular excisions were analyzed before selecting the type of excision. The diamond-shaped excision was favored over elliptical or circular shape because this type of resection provides close enough equal sizes of the upper, lower, and lateral points. Upon mobilizing the vaginal wall from the urinary bladder, vaginal surgical fascia resection was also

made by applying a diamond-shaped excision (Fig. 6). Suturing the diamond-shaped edges creates the desired compression on the G-spot sac. At the same time, diamond-shaped excision helps to address two objects: 1. creating tension within the anterior distal vaginal wall and 2. no shortening of the vagina. Also, it is easier to excise additional tissue, if the distance needs to be shortened between the diamond-shaped edges. A vertical elliptical excision will also serve well in this surgical operation. Theoretically, a circular excision can create elongation of the suture line.

Electronic and manual searches of the clinical-scientific literature failed to identify any existing surgical therapy for improving G-spot function; therefore, the current newly developed surgical technique is the very first description of such a surgical method and due to this fact, a comparison analysis between other surgical techniques and the surgical intervention presented here cannot be offered.

Commercial marketing literature is available for G-spot Amplification® or later termed as G-shot®. A collagen injection or oxytocin injection is suggested as therapy for G-spot dysfunction by practitioners; however, these modes of treatments require repeating injections in short intervals. Practitioners claimed, without scientific documentation, that such injections increase the intensity and numbers of vaginal orgasms. The G-spot Amplification® concept is based on a collagen injection (filler) into "the septum between the urinary bladder and the anterior distal vaginal wall." This concept was adopted from existing traditional therapy for intrinsic sphincter deficiency. Additionally, oxytocin is used to infiltrate the same area. Bachelt et al. reviewed the marketing literature, and these authors tried to interpret the scientific rationale for such a therapeutic approach to improve G-spot function [12].

This investigation has a number of limitations. The case series study will not allow drawing conclusions about the safety and effectiveness of G-spotplasty. The small sample size of this study would not allow for making conclusions for the general population, but the number of subjects was sufficient to test the surgical implementation of the newly developed G-spotplasty technique. In this descriptive observational case series study, the diagnosis was based on the expertise of the investigator, and such a dependence can result in some imperfections and preconceptions; although, this author made every effort to eliminate such an occurrence.

There are a number of strengths of this study. The data were collected from subjects who suffered from inability to reach vaginal orgasms due to G-spot dysfunction with prior documented ability to reach vaginal orgasms. Sexual activities, sexual behavior, and sexual concerns were evaluated with a validated multidimensional inventory of the SRA-Q. This study can be utilized not only for the treatment of G-spot deficiency but also for clinical-scientific research.

Conclusions

The G-spotplasty is a simple surgical intervention, easy to implement, and improves sexual activities, sexual behaviors, and sexual concerns. The preliminary results of this study are very promising and paved the way for additional clinical-scientific research.

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Compliance with Ethical Standards

Conflict of interest The author declares no conflict of interest.

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