Int Urogynecol J
DOI 10.1007/s00192-012-1831-y

CLINICAL OPINION

Does the G-spot exist? A review of the current literature

Vincenzo Puppo · Ilan Gruenwald

Received: 30 November 2011 / Accepted: 10 May 2012

Abstract In 1950, Gräfenberg described a distinct erotogenic zone on the anterior wall of the vagina, which was referred to as the Gräfenberg spot (G-spot) by Addiego, Whipple (a nurse) et al. in 1981. As a result, the G-spot has become a central topic of popular speculation and a basis of a huge business surrounding it. In our opinion, these sexologists have made a hotchpotch of Gräfenberg's thoughts and ideas that were set forth and expounded in his 1950 article: the intraurethral glands are not the corpus spongiosum of the female urethra, and Gräfenberg did not report an orgasm of the intraurethral glands. G-spot amplification is a cosmetic surgery procedure for temporarily increasing the size and sensitivity of the G-spot in which a dermal filler or a collagen-like material is injected into the bladder–vaginal septum. All published scientific data point to the fact that the G-spot does not exist, and the supposed G-spot should not be identified with Gräfenberg's name. Moreover, G-spot amplification is not medically indicated and is an unnecessary and inefficacious medical procedure.

Keywords Vulvovaginal surgery · Urethra · Female prostate · Female orgasm · Clitoris · Vagina

V. Puppo
Centro Italiano di Sessuologia (CIS),
Via Regnoli 74,
40138 Bologna, Italy

I. Gruenwald
Neurourology Unit, Rambam Healthcare Campus,
Haifa, Israel

V. Puppo (✉)
Via Pistoiese 301/6,
50145 Florence, Italy
e-mail: dottvincenzopuppo@yahoo.it

The term Gräfenberg spot (G-spot), was coined by Addiego, Whipple (a nurse) et al. in 1981 [1] and refers to an "erotically sensitive spot" located in the pelvic urethra and palpable through the anterior vaginal wall. The existence of the G-spot is controversial within the scientific and medical communities and among women themselves. Proponents of the G-spot's existence have been criticized for giving too much credence to anecdotal evidence and to results of questionable investigations. In his article published in the *American Journal of Obstetrics and Gynecology* in 2001, Terence Hines, a neuroscientist at Pace University, wrote [2]: "Gräfenberg discusses no evidence for a G-spot … Others, he says, derived sexual pleasure from inserting objects such as hat pins, into their urethras. Just how later writers (i.e., 2) transformed these reports into evidence for a G-spot is unclear." Hines also writes: "Until a thorough and careful histological investigation of the relevant tissue is undertaken, the G-spot will remain a sort of gynecologic UFO [unidentified flying object]: much searched for, much discussed, but unverified by objective means" [2].

In 1981, Addiego et al. [1] reported the findings of their investigation of "A karyotypically normal, multiparous woman suffered for a decade with urinary stress incontinence. During that time she had learned to inhibit an orgasmic response which led to bedwetting. Although the liquid produced did not appear to be urine, she falsely concluded that her orgasmic expulsion was a manifestation of urinary incontinence....At the April 1979 testing session, the subject identified an erotically sensitive spot, palpable through the anterior wall of her vagina." The patient also did not fail to mention that "Around this time her physician told her that she had a grade one cystocele." After completing physical examination, the physician recorded: "The cervix was clean and the vaginal mucosa was normal, with a very slight cystocele evident. The subject noted an area of increased sensitivity during palpation along the urethra. It coincided

Published online: 06 June 2012

with a fairly firm area approximately 2 cm by 1.5 cm, with the long axis along the course of the urethra. This area was palpated, and the subject reported that it caused the sensation of having to urinate. Further digital stimulation made the sensation pleasurable. The area grew approximately 50 % larger upon stimulation. No contraction of the spot could be elicited voluntarily or involuntarily." On the basis of these findings, Addiego and his colleagues concluded that: "the orgasms she experienced in response to the Gräfenberg stimulation felt much the same, whether or not they were accompanied by expulsion" [1].

The supposed G-spot of the anterior vaginal wall is located in the Pawlik's triangle, a region that corresponds to Lieutaud's triangle in the bladder (Fig. 1). The mucosa of this region of the anterior vaginal wall is smooth and is an area with minor resistance; hence, it can easily bulge into the vagina of a woman with a cystocele. Of all potential candidates to investigate for establishing the existence of an erotically sensitive spot in the vagina, it is quite surprising that Addiego and his colleagues chose to report their findings in a woman with a cystocele. Such a woman is surely not the ideal subject for identifying an "erotically sensitive spot" or for detecting the G-spot. Addiego and colleagues reported [1]: "[1]After this case study was submitted for publication, the subject reported that there has now been one exception to this. She said she had recently experienced orgasm accompanied by ejaculation in response to cunnilingus, but without Gräfenberg-spot stimulation." Their conclusions that "the area palpated in the subject was the Gräfenberg spot" and statements that "the orgasms she experienced in response to the Gräfenberg stimulation" and "She agreed with our conclusion" have no scientific basis. Their conclusions have no basis because Gräfenberg did not relate to or describe any orgasm of the female prostate in his original 1950 report [3].

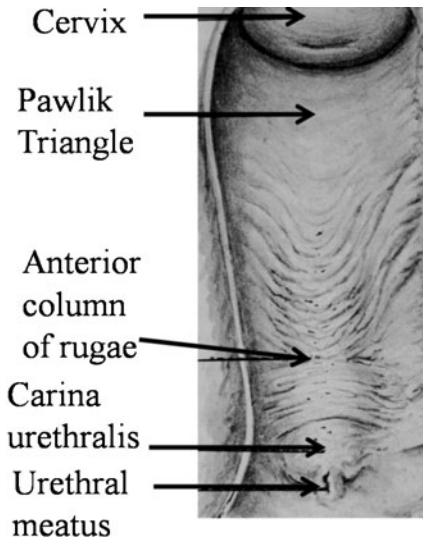

Fig. 1 Anterior vaginal wall

It is also worth noting that Gräfenberg did not describe a vaginal spot or the G-spot in his 1950 article [3]. In fact, the title of his 1950 article was "The Role of the Urethra in Female Orgasm," not the role of the vagina in female orgasm. Although Gräfenberg did describe some cases of female and male urethral masturbation and illustrated the corpus spongiosum of the female urethra, he did not describe an orgasm of the intraurethral glands. Specifically, Gräfenberg wrote the following on page 146 of his 1950 article [3]: "An erotic zone always could be demonstrated on the anterior wall of the vagina along the course of the urethra… During orgasm this area is pressed downwards against the finger like a small cystocele protruding into the vaginal canal… Analogous to the male urethra, the female urethra also seems to be surrounded by erectile tissues like the corpora cavernosa. In the course of sexual stimulation the female urethra begins to enlarge and can be felt easily. It swells out greatly at the end of orgasm. The most stimulating part is located at the posterior urethra, where it arises from the neck of the bladder." Gräfenberg writes later on page 147 in the same article: "Occasionally the production of fluids is so profuse that a large towel has to be spread under the woman to prevent the bed sheets getting soiled… If there is the opportunity to observe the orgasm of such women, one can see that large quantities of a clear transparent fluid are expelled not from the vulva, but out of the urethra in gushes… I am inclined to believe that 'urine' reported to be expelled during female orgasm is not urine, but only secretions of the intraurethral glands correlated with the erotogenic zone along the urethra in the anterior vaginal wall."

Another misused term that is claimed to have originated from Gräfenberg's 1950 article is "female ejaculation." In their report, Addiego et al. [1] wrote: "Such an orgasm [induced by anterior vaginal wall stimulation] was often accompanied by expulsion of liquid from the urethra," and they considered "the female prostate, the system of glands and ducts which surrounds the urethra and which is the embryologic homologue of the male prostate, a plausible source of female ejaculate."

In 1981, Perry and Whipple [4] tested "the hypothesis that women who ejaculate at orgasm have stronger pelvic muscle contractions under voluntary control than women who do not ejaculate." But in the same article, they wrote that "Female ejaculation is hypothesized to be a component of some women's 'uterine' orgasms." The term "female ejaculation" that is used by these authors is controversial from a physiological point of view: Shafik et al., in 2009, wrote "Opinions vary over whether female ejaculation exists or not. We investigated the hypothesis that female orgasm is not associated with ejaculation. Thirty-eight healthy women were studied....The female orgasm was not associated with

the appearance of fluid coming out of the vagina or urethra" [5]. The more correct term is "female emission," and a "uterine" orgasm simply does not exist [6]. In their report, Perry and Whipple [4] also describe the design of their study and continue to use the term ejaculation: "Subjects were divided into 'ejaculators' and 'non-ejaculators' on the basis of self-report of their sexual responses on a questionnaire....The Gräfenberg spot examination which followed consists of the systematic palpation of the entire anterior wall of the vagina between the posterior side of the pubic bone and the cervix." The examining physician would ask the following two questions when palpating the supposed G-spot on the anterior vaginal wall, which was identified in every subject: "What do you feel?" and "Does it feel good or bad?" Most often, women responded "nothing" to the first question [4]. As most women gave a negative response to the first question, the second question becomes pointless and is clearly misinterpreted by the women because most would almost always be inclined to reply "it feels good" or something similar. Moreover, the second question is misleading, very suggestive, and should not have even been asked!

In 2010, Burri et al. [7] wrote: "The existence of the G-spot seems to be widely accepted among women, despite the failure of numerous behavioral, anatomical, and biochemical studies to prove its existence." In the same article, the authors also wrote: "there is no physiological or physical basis for the G-spot." In 2008, Gravina, Jannini et al. [8] claimed that they had ultrasound images of the G-spot, but no such images were included in the published article. In their 358-page book *The Science of Orgasm*, Komisaruk, Beyer-Flores, and Whipple [9] make only passing mention of the G-spot: "Stimulation of the pelvic nerve may also occur with stimulation of the area of the G-spot (the area of the female prostate gland) and may also account for the reports of orgasm and 'female ejaculation' from the urethra experienced by some women." As so little is mentioned about the G-spot in such a thick, detailed book focused specifically on orgasm, one can only assume that the role of the G-spot, if such a spot does indeed exist, is devoid of any importance in the female orgasm. The claims that the G-spot does not exist are also echoed by Buisson [10], who quotes from Puppo [6, 11]: "Gräfenberg, in 1950, discovered no G-spot and he did not report an orgasm of intraurethral glands" and highlights the fact that "there are no ultrasonographic images or anatomical pictures of the G-spot, and the female prostate has no anatomical structure that can cause an orgasm." None of these strong arguments have ever been rebutted in the medical literature.

In our opinion, Addiego, Whipple, Perry, Jannini, and others [1, 4, 9, 12, 13] have also made a hotchpotch of Gräfenberg's thoughts and ideas that were set forth and expounded on pages 146 and 147 of his 1950 article: the intraurethral glands are not the corpus spongiosum of the female urethra. The debate on the existence of the G-spot degenerated to an unprofessional level when Jannini (an andrologist) wrote the following in 2010 [12]: "Their claims [on the inexistence of the G-spot] are mostly based on a poorly researched review article, written by an author [Dr. Terence Hines] who is almost unknown in academic medicine and who never published on the field, where the G-spot has been defined as 'a modern gynecologic myth'." Hines's article was published in the peer-reviewed *American Journal of Obstetrics and Gynecology*, and Jannini's verbal assault on Hines' article and the journal's credibility is unjustified. His assault could even be interpreted as being offensive to both Hines and the journal.

G-spot amplification, also called G-spot augmentation, or the G-shot, is a cosmetic surgery procedure for temporarily increasing the size and sensitivity of what some believe to be the G-spot, which is located about half way between the pubic bone and the cervix about 3 in. into the pelvis, in which a dermal filler or a collagen-like material is injected into the bladder–vaginal septum [14, 15]. G-spot amplification is a minimally invasive surgical procedure in which a foreign material is inserted or injected into the anterior vaginal wall. The underlying rationale of the procedure is to increase the sensory input and the resultant sexual satisfaction when the penis rubs the anterior vaginal wall during sexual intercourse [14, 15]. The distressful psychological state of not responding to G-spot stimulation during sexual intercourse is probably one of the major forces that drive many women to search for any kind of solution, which includes G-spot amplification, even though no proof of its efficacy exists. Does G-spot amplification improve sexual pleasure and satisfaction in women, or is it a useless and dangerous medical procedure? If the supposed G-spot is located on the anterior vaginal wall between the vagina and the urethra, why is the dermal filler injected into the bladder–vaginal septum for G-spot amplification? Concerns about the efficacy and safety of G-spot amplification have been raised because no peer-reviewed studies have been published, and no double-blind placebo-controlled studies have been reported on the procedure. Moreover, G-spot amplification has not been approved by the US Food and Drug Administration and the American Medical Association [14–17]: "The Food and Drug Administration said that it had not approved any fillers for G-spot amplification, or for injection into the anterior vaginal wall, nor had it received any complaints….Using products for purposes beyond what they were approved for is somewhat common in medicine; it's referred to as 'off-label use.'" [17].

When interviewed in 2007 [17], Hines vigorously defended his opinion on G-spot amplification, which was published in 2001 [2]: "Sheer quackery! I've never heard such nonsense in my life! The anatomical evidence is simply not there" [17]. "Women who fail to find their G-spot

because they fail to respond to stimulation as the G-spot myth suggests that they should, may end up feeling inadequate or abnormal" [2].

Jeffrey Spike, a bioethicist at Florida State University's College of Medicine, considers that "doctors who allegedly enhance women's G-spots are profiting from their [women's] insecurities" and "they are engaging in something more like medical fraud" [17]. He also wrote that the G-spot is "like a folk tale....You can prove that something exists if you find it, but if you don't find it, that doesn't prove that it doesn't exist. The G-spot belongs in the same category as angels and unicorns" [17].

In 2007, the "Committee Opinion" by the American College of Obstetricians and Gynecologists stated [16]: "Other procedures, including vaginal rejuvenation, designer vaginoplasty, revirgination, and G-spot amplification, are not medically indicated, and the safety and effectiveness of these procedures have not been documented. No adequate studies have been published assessing the long-term satisfaction, safety, and complication rates for these procedures…. Women should be informed about the lack of data supporting the efficacy of these procedures and their potential complications, including infection, altered sensation, dyspareunia, adhesions, and scarring." Marchitelli et al. [18], in a retrospective study reported their findings on 73 women who were seen on consultation for vulvovaginal aesthetic surgery. concluded that: "Most patients seen on consultation for vulvovaginal plastic surgery had no need for it and only received information regarding female anatomy and sexuality."

In a recent attempt to define a so-called G-spot, Ostrzenski extracted parts of the anterior vaginal wall of the cadaver of an 83-year old woman and called it the G-spot: "The anatomic existence of the G-spot was documented in this study with potential impact on the practice and clinical research in the field of female sexual function." [19]. The author wrote: "The G-spot was identified as a sac with walls that grossly resembled the fibroconnective tissues, was easy to observe, and was a well-delineated structure"; however, no histologic studies of the samples were offered. The author also stated: "The G-spot gene has been identified," but this is a misreading of the reference he quotes [20]. It seems totally inappropriate to claim that the existence of a G-spot has been "documented" on the basis of one cadaver dissection by a physician who is actively involved in a commercially oriented institute.

In conclusion, the claims made in the numerous articles written by Addiego, Whipple, Perry, Jannini, Buisson, O'Connell, Brody, Ostrzenski, and others have no scientific basis. These authors could also be accused of using Gräfenberg's name to create an impression that their studies do have a scientific basis. The use of such non-scientifically-based terms by researchers and scientists serves as the fuel for the evolution of myths, which are then amplified by mass media and become popular and well-accepted ones. Some medical professionals take advantage of these myths—and of the expectations (or the distress) of women influenced by the myth—for their own personal benefit. In the case of G-spot amplification, some gynecologists invented or developed this procedure, which is both futile and unnecessary. Moreover, the procedure may cause more harm than good and can potentially cause discontent and frustration for women who undergo G-spot amplification. We, the authors of this review article, are deeply concerned about the way this—and similar—procedures have been quickly and unprofessionally introduced and are now being widely performed without monitoring or control. Hence, we warn colleagues to maintain a high level of professionalism and not to be tempted by nonmedical considerations. As written by Kilchevsky et al. [21] in 2012: the "G-spot has become the center of a multimillion dollar business."

In our opinion, all published scientific data point to the fact that the Gräfenberg spot does not exist. Vaginal/uterine/clitoral orgasm, female ejaculation, the G-, A-, C-, U-, or K-spot orgasm, as well as G-spot amplification, are terms that should not be used by urologists, gynecologists, sexologists, the mass media, and all women [6, 11, 21–24]. Finally, we strongly argue that G-spot amplification is an unnecessary and inefficacious medical procedure, and the supposed G-spot should not be identified with Gräfenberg's name [6, 11, 21–24].

Conflicts of interest None.

References

1. Addiego F, Belzer EG, Comolli J, Moger W, Perry JD, Whipple B (1981) Female ejaculation: a case study. J Sex Res 17:13–21
2. Hines TM (2001) The G-spot: a modern gynecologic myth. Am J Obstet Gynecol 185:359–362
3. Gräfenberg E (1950) The role of urethra in female orgasm. Int J Sexol 3:145–148
4. Perry JD, Whipple B (1981) Pelvic muscle strength of female ejaculators: evidence in support of a new theory of orgasm. J Sex Res 17:22–39
5. Shafik A, Shafik IA, El Sibai O, Shafik AA (2009) An electrophysiologic study of female ejaculation. J Sex Marital Ther 35:337–346
6. Puppo V (2011) Embryology and anatomy of the vulva: the female orgasm and women's sexual health. Eur J Obstet Gynecol Reprod Biol 154:3–8
7. Burri AV, Cherkas L, Spector TD (2010) Genetic and environmental influences on self-reported G-spots in women: a twin study. J Sex Med 7:1842–1852
8. Gravina GL, Brandetti F, Martini P, Carosa E, Di Stasi SM, Morano S, Lenzi A, Jannini EA (2008) Measurement of the thickness of the urethrovaginal space in women with or without vaginal orgasm. J Sex Med 5:610–618
9. Komisaruk BR, Beyer-Flores C, Whipple B (2006) The science of orgasm. Johns Hopkins University, Baltimore

10. Buisson O (2011) Answer to V. Puppo's letter: "G-spot does not exist". Gynecol Obstet Fertil 39:267–268
11. Puppo V (2011) Anatomy of the clitoris: revision and clarifications about the anatomical terms for the clitoris proposed (without scientific bases) by Helen O'Connell, Emmanuele Jannini and Odile Buisson. ISRN Obstet Gynecol Article ID 261464, 5 pages
12. Jannini EA, Whipple B, Kingsberg SA, Buisson O, Foldès P, Vardi Y (2010) Who's afraid of the G-spot? J Sex Med 7:25–34
13. Ladas AK, Whipple B, Perry J (1982) The G-spot and other recent discoveries about human sexuality. Holt, Reinehart & Wiston, New York
14. Wikipedia. G-spot amplification. Available at: http://en.wikipedia.org/wiki/G-Spot_amplification. Accessed 21 Nov 2011
15. Doctor G-spot (2007) Page 1. Available at: http://www.broward-palmbeach.com/2007-07-12/news/doctor-g-spot/. Accessed 21 Nov 2011
16. American College of Obstetricians and Gynecologists (2007) ACOG Committee Opinion No. 378: Vaginal "rejuvenation" and cosmetic vaginal procedures. Obstet Gynecol 110:737–738
17. Doctor G-spot (2007) Page 2. Available at: http://www.broward palmbeach.com/2007-07-12/news/doctor-g-spot/2/. Accessed 21 Nov 2011
18. Marchitelli CE, Sluga MC, Perrotta M, Testa R (2010) Initial experience in a vulvovaginal aesthetic surgery unit within a general gynecology department. J Low Genit Tract Dis 14:295–300
19. Ostrzenski A (2012) G-spot anatomy: a new discovery. J Sex Med 9:1355–1359
20. Upton GJ, Langdon WB, Harrison AP (2008) G-spots causes incorrect expression measurement in Affymetrix microarrays. BMC Genomics 9:613–622
21. Kilchevsky A, Vardi Y, Lowenstein L, Gruenwald I (2012) Is the female G-spot truly a distinct anatomic entity? J Sex Med 9:719–726
22. Puppo V (2012) The Gräfenberg spot (G-spot) does not exist-a rebuttal of Dwyer PL: Skene's gland revisited: function, dysfunction and the G spot. Int Urogynecol J 23:247
23. Puppo V, Mannucci A, Abdulcadir J, Puppo G (2008) Clarifications about some theories in sexology and about a correct sexual terminology. Oral Presentation-9th Congress of the European Federation of Sexology (EFS). Rome, 13–17 April 2008. Sexologies 17(Suppl. 1):T10-O-25: S147. Full text available at: http://www.youtube.com/user/NewSexology?gl=IT&hl=it#p/u/0/E52HiDw5bhM. Accessed 21 Nov 2011
24. Standring S (2008) Gray's anatomy: the anatomical basis of clinical practice, 40th edn. Churchill Livingstone-Elsevier, New York