Searching for radiologic and histologic evidence on live vaginal tissue: Does the G-spot exist?

Canlı vajinal dokuda radyolojik ve histolojik kanıt için araştırma: G-noktası var mı?

Ahmet Akın Sivaslıoğlu1, Sezen Köseoğlu2, Funda Dinç Elibol3, Yelda Dere4, Ayavar Cem Keçe5, Eray Çalışkan6

1 Muğla Sıtkı Koçman University Faculty of Medicine, Department of Obstetrics and Gynecology, Muğla, Turkey
2 Associate Professor, Private, Muğla, Turkey
3 Muğla Sıtkı Koçman University Faculty of Medicine, Department of Radiology, Muğla, Turkey
4 Muğla Sıtkı Koçman University Faculty of Medicine, Department of Pathology, Muğla, Turkey
5 Specialist, Psychotherapist, Private, Ankara, Turkey
6 Okan University Faculty of Medicine, Department of Obstetrics and Gynecology, İstanbul, Turkey

Abstract

Objective: There is a growing debate on the existence of the G-spot. G-spot amplification by various surgical interventions has become mainstream for esthetic vaginal surgery despite a lack of conclusive proof of the G-spot. The aim of this study was to search for histologic evidence in regions of so-called hyperintense focus (HF) (considered as the G-spot) using magnetic resonance imaging (MRI) mapping and biopsied tissues.

Materials and Methods: Fifteen patients who had grade 2 or higher anterior compartment defects were enrolled in the study. All patients were subjected to MRI. When a HF was seen, its localization, dimensions, and distances to adjacent structures were measured in images. Dissections in the anterior vaginal wall were performed in accordance with the measurements derived from MRI and tissue measuring 0.5x0.5 cm was biopsied from the determined HF.

Results: An HF was determined in MRI of three (20%) patients. However, no significant neurovascular tissue density was observed histologically in any of the biopsy specimens obtained from the surgical dissections under the guidance of MRI mapping.

Conclusion: Our findings denote that there is no G-spot in the anterior vaginal wall.

Keywords: G-spot, hyperintense focus, MRI, neurovascular tissue

Öz

Amaç: G-noktasının varlığı konusunda büyüyen bir tartışma vardır. Öte yandan, G-spot amplifikasyonları estetik vajinal cerrahide ana akım haline gelmiştir. Bu çalışmanın amacı, hiperintens odak (HF) (G-noktası olarak kabul edilmiştir) denilen bölgelerde manyetik rezonans görüntüleme (MRG) ile haritalama ve biyopsi aracılığıyla histolojik kanıtları araştırmaktır.

Gereç ve Yöntemler: Grade 2 veya daha yüksek ön kompartman defekti olan on beş hasta çalışmaya alınmıştır. Tüm hastalar MRG'ye tabi tutuldu. HF görüntüşündede; lokalizasyonu, boyutları, komşu yapılar ile mesalelere görüntülenenlerde ölçüldü (‘vajinanın ön duvarının haritalanması’). Ön vajinal duvardaki diseksiyonlar MRG'den elde edilen ölçümler uygun olarak gerçekleştirilmiştir ve HF denilen dokudan 0,5x0,5 cm boyutlarında doku biyopsis yapıldı.

Bulgular: Uç hastada (%20) HF belirlendi. Ancak MRG haritalaması kalavuzluğunda cerrahi diseksiyonlardan elde edilen biyopsis örneklerinin hiçbirinde histolojik olarak önemli bir nörovasküler doku yoğunluğu gözlenmedi.

Sonuç: Bulgularımız vajen ön duvarda G-noktasının bulunmadığını göstermektedir.

Anahtar Kelimeler: G-noktası, hiperintens odak, MRG, nörovasküler doku

Address for Correspondence/Yazışma Adresi: PhD. Ahmet Akın Sivaslıoğlu
Muğla Sıtkı Koçman University Faculty of Medicine, Department of Obstetrics and Gynecology, Muğla, Turkey
Phone: +90 532 277 06 18 E-mail: akinsivaslioglu@gmail.com ORCID ID: orcid.org/0000-0003-3711-0118
Received/Geliş Tarihi: 25.11.2020 Accepted/Kabul Tarihi: 22.02.2021

© Copyright 2021 by Turkish Society of Obstetrics and Gynecology
Turkish Journal of Obstetrics and Gynecology published by Galenos Publishing House.
**Introduction**

The existence of the G-spot is a debatable issue in sexual medicine. Despite a lack of definitive evidence for its existence, use of the term “G-spot” has become widely accepted both in the lay media and scientific research. Moreover, although the G-spot has not been definitely shown, G-spot amplification by various surgical interventions has become mainstream for esthetic vaginal surgery.

In their observational magnetic resonance imaging (MRI) study, Maratos et al.\(^1\) claimed that the G-spot had been visualized as a hyperintense focus (HF). Hence, the main aim of this study was to shed light on this controversial issue using MRI mapping (MRIM) and to search for histologic evidence in tissues biopsied from the projection of HF.

**Materials and Methods**

The study is a prospective observational study. The ethics committee of the university approved the study (decision date and number: June 18th, 2020-06/V). Fifteen patients who had anterior vaginal compartment defects (Ba point ≥ 2 according to POP-Q) and were willing to undergo surgery between July 1st, 2020, and October 1st, 2020, were enrolled in the study. All patients were asked if they had any knowledge concerning the G-spot and whether they believed in its existence. All surfaces of the anterior vaginal wall were tactiley stimulated by starting at the urethrovesical junction and staying within the boundaries of the lateral fornix towards the anterior fornix, by making a beckoning gesture with the right-hand forefinger while wearing a sterile glove during a gynecologic examination in the lithotomy position. The patients were asked whether they had any increased sensitivity in any area during this examination. Patients with the following were not included in the study: previous vaginal surgery, presence of concomitant apical prolapse and or paravaginal defect, history of estrogen and/or antidepressant use, postmenopausal status, a known malignancy and the patients whose coital frequency is <1/week. Informed consent regarding the MRI and surgery (biopsy + anterior compartment surgery) was given by the enrolled patients.

All patients were subjected to MRI with a 5-mm slice thickness. When a HF (putative G-spot) was seen, its localization, dimensions, distance to the hymenal ring (vaginal introitus), to the external urethral meatus and the depth from the vaginal lumen were measured on images so that the localization of the “putative G-spot” seen in the MRI was precisely determined and this procedure was named as “mapping of the anterior wall of the vagina.” Subsequently, each patient was enlisted for anterior compartment defect surgery.

Before the main surgery, the HF was projected on the anterior vaginal wall in accordance with the measurements derived from MRI (under the strict guidance of the mapping of the anterior wall of the vagina) and a spot was marked with a sterile pen. A tissue measuring 0.5x0.5 cm was biopsied from this region (surgical pictures, Picture 1-3). This is a novel idea and we called it MRIM.

**Statistical Analysis**

Statistical analyses were performed using the Statistical Package for the Social Sciences software, version 23 (SPSS, Inc., Chicago, IL). The data are expressed as the mean and range for continuous variables, and binary variables are reported as numbers and percentages.

**Radiological Technique and Evaluation**

All patients underwent pelvic MRI in the supine position using a 3T MR (Siemens Magnetom Skyra, Erlangen, Germany) before surgery. T1-weighted (W) images were obtained in axial and sagittal planes. T2-W images were acquired in axial, sagittal and transverse planes. The slice thickness of the sequences was 5 mm.

The projection of HF was marked on the vaginal wall using a sterile pen according to the MRI mapping (Surgical pictures, Picture 1, 2). In addition, the lower abdominal MRIs were interpreted by the same radiologist.

**Histologic Evaluation**

The slides were ready for evaluation after routine automated tissue processing, paraffin embedding, and hematoxylin & eosin (H&E) staining. In addition, for detailed microscopic evaluation, immunohistochemistry was performed on biopsied tissues. S100 and CD34 immunostaining were used to identify neuronal and vascular structures, respectively. Three-four-mm-thick
sections were cut from the paraffin blocks and immunostaining was performed automatically using a Leica Bond-Max with anti-S100 and anti-CD34 antibodies (Leica). The H&E and immunostained slides were examined for the presence and intensity of neural and vascular structures under a Nikon Ni-U light microscope (Histological images 1-6). The presence of neural bundles was verified using S100 immunohistochemistry and S100-stained neural structures were counted under the light microscope. The total count of neural structures were divided by the total microscopic area to calculate the number of neural bundles per mm².

The biopsy specimens were evaluated by the same pathologist.

**Results**

A total number of 15 patients were included in the study. The demographic data of the patients are given in Table 1. The mean age of the patients was 45±5.12 years.

Eleven of the 15 patients (73%) knew of the G-spot, and 4/15 (27%) did not. Interestingly, these 4 patients had heard about

---

**Image 1.** Localization of hyperintense focus on axial and sagittal T2-weighted images of case number 13

**Image 2.** On sagittal T2-weighted image hyperintense focus and the distance between urethra-focus (first red line) and introitus-focus (second red line) of case 13

**Image 3.** Hyperintense focus on axial T2-weighted images marked with asterix the of case number 4

**Image 4.** Anteroposterior distance (red line) and area (blue line) of hyperintense focus on axial T2-weighted images of case number 4

**Image 5.** Hyperintense focus on axial T2-weighted image shown with blue arrow

---

**Picture 1, 2.** The hyperintense focus marked on the vaginal wall using MRI mapping and a full-thickness linear incision from the urethrovresical junction and extending the cervico-vesical junction

**Picture 3.** Taken of a biopsy of 0.5x0.5 cm from the region marked by MRIM the G-spot, but they had no clear idea regarding its existence. On the other hand, only 1 patient (0.06%) answered positively when asked whether she had increased sensitivity during the
gynecologic examination of the anterior vaginal wall (case number 6); however, this woman had no structure compatibility (HF) with the G-spot complex in the lower abdominal MRI. Three of 15 patients (20%) had putative G-spots (HFs) in the lower abdominal MRI (case number 4, case number 10, and case number 13). The data related to putative G-spots are given in Table 2. All putative G-spots were detected on the left side of the vagina. The mean distance to the external urethral meatus was calculated as 38.53±6.74 (range 31-44) mm. Neurovascular tissue density was not observed histologically in any of the biopsied tissue mapped using MRI. Histologic examination of tissue samples showed only a few neural structures both in the sections stained with H&E and S100 (Histopathologic images 1-6).

Discussion

This is the first study on live tissues searching for the G-spot both histologically and radiologically. The G-spot is defined as “a sensitive area inside a woman’s vagina that is thought to give great sexual pleasure when touched”(2). Hence, it would be prudent to scrutinize the anatomy of the anterior vaginal wall. The vagina is essentially a tube that connects the uterus to the perineum. The vagina is composed of four histologic layers (internal to external): (1) Stratified non-keratinized squamous epithelium - this layer provides protection and is lubricated by

Table 1. Demographic features of the patients

| Age (years) | Gravida | Hyperintense focus |
|------------|---------|--------------------|
| Case 1     | 42      | 2                  | -  |
| Case 2     | 35      | 2                  | -  |
| Case 3     | 39      | 3                  | -  |
| Case 4     | 40      | 1                  | +  |
| Case 5     | 45      | 2                  | -  |
| Case 6     | 46      | 2                  | -  |
| Case 7     | 49      | 3                  | -  |
| Case 8     | 51      | 3                  | -  |
| Case 9     | 44      | 1                  | -  |
| Case 10    | 50      | 1                  | +  |
| Case 11    | 43      | 2                  | -  |
| Case 12    | 40      | 2                  | -  |
| Case 13    | 52      | 2                  | +  |
| Case 14    | 50      | 3                  | -  |
| Case 15    | 49      | 1                  | -  |

#: Absent, #: Present
The dorsal perineal membrane in an 83-year-old fresh cadaver, defined the G-spot as fibroconnective erectile tissue on the anterior vaginal wall. First, in 2012, Ostrezenski described an area along the anterior wall of the vagina that projects papillae into the overlying epithelium. The larger thin-walled veins and nerve fibers are located here. The nerve fibers of the vagina are mostly parasympathetic and arise vasodilatory effects on the erectile tissue of the vestibular bulbs and clitoris. The distal third of the vaginal wall possibly has a richer innervation and the erectile tissue of the vestibular bulbs and clitoris. The distal third of the vagina was rich in neurovascular tissue and had its own microscopic structure other than the urethra and vaginal wall epithelium in the location of the putative G-spot in a study on 13 fresh cadavers with an age range of 32 to 97 years. Hoag also emphasized that the lateral vaginal veins observed in anatomic dissection were not erectile tissue and the veins were responsible for the venous flow of the urethra, vaginal wall, and clitoris with dense vascular structure. Our findings are in accordance with Hoag's findings. Moreover, Puppo revised the female sexual anatomic terminology and noted that there was no G-spot and this may be scientific fraud.

As the world became more open to sexuality in recent years, female sexual activity has taken its place in the centre of sexual medicine. In this context, claiming the G-spot as a hypererogenic erectile area and amplification procedures (such as G-shot, hyaluronic acid injections, autologous adipose tissue injections) started to generate great marketing and interest. It is noteworthy that the presence of the G-spot is contradictory and the scientific background is weak regarding the benefits of amplification procedures applied to this spot. In addition, amplification interventions to the G-spot are even said to be female genital mutilation type 4. The belief that the presence of the G-spot both creates motivation for women to achieve sexual satisfaction and opportunities for those who benefit from this market. Although the presence of a hypererogenic region in the anterior vaginal wall has been claimed to be the G-spot, the histologic structure of the anterior wall should not be forgotten. The anterior wall of the vagina is thinner and richer in neural tissue than the posterior wall of the vagina. Keeping in mind this anatomic information, the amplification procedures performed to the region defined as the "G-spot" in the anterior wall of the vagina may in fact cause ballooning of the anterior wall of the vagina so that penile contact of this region results in increased sexual pleasure.

In our study, only one patient (0.06%, case number 6) reported a hypererogenic region in the anterior wall of the vagina; however, we could not find a HF in the MRI of that patient. In this study, no neurovascular element was found microscopically in biopsy specimens taken from the so-called HF (putative G spot). In the literature, cadaveric dissection studies related to the existence of the G-spot have been performed. However, this study is more advanced because imaging and histologic examination were performed sequentially in live tissues in the search for the G-spot.

### Table 2. Data related to hyperintense focus (putative G-spot)

| Case  | Side | Anteroposterior diameter (mm) | Area (mm²) | Distance to urethra (mm) | Distance to introitus (mm) | Distance to vaginal lumen (mm) |
|-------|------|-------------------------------|-------------|--------------------------|---------------------------|-------------------------------|
| Case 4 | L    | 6                            | 39          | 44                       | 41                        | 3.33                          |
| Case 10 | L    | 4.05                         | 16          | 40.6                     | 38.5                      | 2.9                           |
| Case 13 | L    | 3                            | 12          | 31                       | 32.8                      | 2.6                           |
| Average ± SD |     | 4.35±1.52                   | 22.33±14.57 | 38.53±6.74             | 37.43±4.20                | 2.9±0.36                      |

SD: Standard deviation

cervical mucus, the vagina itself does not contain any glands, besides, this layer has no nerve fibers. (2) Elastic lamina propria - a dense connective tissue layer that projects papillae into the vaginal wall has been claimed to be the G-spot; however, we could not find a HF in the MRI of that patient. In this study, no neurovascular element was found microscopically in biopsy specimens taken from the so-called HF (putative G spot). In the literature, cadaveric dissection studies related to the existence of the G-spot have been performed. However, this study is more advanced because imaging and histologic examination were performed sequentially in live tissues in the search for the G-spot.
Conclusion

Previous studies were performed on cadavers of elderly women, whereas ours is the first to be performed in both a younger (premenopausal) population and in living tissue. So-called HFs were seen in three patients but we could not identify any neuronal element in the biopsied tissues of these women. Our findings denote that there is no G-spot in the anterior vaginal wall. However, more imaging and histologic studies are needed to form a solid conclusion.

Ethics

Ethics Committee Approval: The ethics committee of the university approved the study (decision date and number: June 18th, 2020-06/V).

Informed Consent: Informed consent regarding the MRI and surgery (biopsy + anterior compartment surgery) was given by the enrolled patients.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: A.A.S., Concept: A.A.S., Design: A.A.S., Data Collection or Processing: Y.D., F.D.E., Analysis or Interpretation: A.A.S., S.K., Literature Search: A.C.K., EÇ., Writing: A.A.S., S.K., Y.D.

Conflict of Interest: The authors report no conflict of interest.

Financial Disclosure: Authors have no financial interests about the research.

References

1. Maratos YK, Gombergh R, Cornier E, Minart JP, Amoretti N, Mpotaris A. The G-spot: an observational MRI pilot study. BJOG 2016;123:1542-9.

2. https://www.oxfordlearnersdictionaries.com/definition/english/g-spot?q=G+spot, 2020).
3. Graefenberg E. 1950 The role of the urethra in female orgasm. Int J Sexol 1950;3:145-8.
4. Addiego F, Belzer EG, Comolli J, Moger W, Perry JD, Whipple B. Female ejaculation: a case study. J Sex Res 1981;17:13-21.
5. Ostrzenski A. G-spot anatomy: a new discovery. J Sex Med 2012;9:1355-9.
6. Ostrzenski A. Anatomic documentation of the G-spot complex role in the genesis of anterior vaginal wall ballooning. Eur J Obstet Gynecol Reprod Biol 2014;180:186-91.
7. Ostrzenski A, Krajewski P, Ganjia-Azar P, Wasiutynski AJ, Scheinberg MN, Tarka S, et al. Verification of the anatomy and newly discovered histology of the G-spot complex. BJOG 2014;121:1333-9.
8. Puppo V, Puppo G. Anatomy of sex: Revision of the new anatomical terms used for the clitoris and the female orgasm by sexologists. Clin Anat 2015;28:293-304.
9. Hoag N, Keast JR, O’Connell HE. The “G-Spot” Is Not a Structure Evident on Macroscopic Anatomic Dissection of the Vaginal Wall. J Sex Med 2017;14:1524-32.
10. Puppo V. The G-spot does not exist. BJOG 2014;121:1341.
11. Song YB, Hwang K, Kim DJ, Han SH. Innervation of vagina: microdissection and immunohistochemical study. J Sex Marital Ther 2009;35:144-53.