SEXUAL MEDICINE ORIGINAL RESEARCH

Retrospective Study of the Prevalence and Risk Factors of Clitoral Adhesions: Women's Health Providers Should Routinely Examine the Glans Clitoris

Leen Aerts, MD, PhD,[1] Rachel S. Rubin, MD,[2] Michael Randazzo,[3] Sue W. Goldstein, CCRC, CSE,[3] and Irwin Goldstein, MD[3,4]

ABSTRACT

Introduction: The glans clitoris is covered by a prepuce that normally moves over the glans surface and can be retracted beyond the corona. Clitoral adhesions, ranging from mild to severe, occur when preputial skin adheres to the glans. Physical examination consistent with clitoral adhesions is based on the inability to visualize the entire glans corona. In this closed compartment, the space underneath the adherent prepuce and clitoris can become irritated, erythematous, or infected and can result in sexual dysfunction.

Aim: To determine the prevalence of clitoral adhesions in a sexual medicine practice and assess risk factors associated with clitoral adhesions.

Methods: This research involved retrospective examinations of vulvoscopy photographs taken from August 2007 to December 2015. Clitoral adhesions were considered absent when preputial retraction enabled full glans corona visualization. The study group consisted of women with mild, moderate, or severe clitoral adhesions based on more than 75%, 25% to 75%, or less than 25% glans clitoris exposure without full corona visualization, respectively. 2 independent reviewers evaluated photographs; a 3rd analyzed study group health record data.

Main Outcome Measure: Prevalence of severity of clitoral adhesions.

Results: Of the 1,261 vulvoscopy photographs, 767 (61%) were determined adequate for assessment and 614 photographs represented individual patients. The study group with clitoral adhesions consisted of 140 women (23%) of whom 44%, 34%, and 22% demonstrated mild, moderate, and severe clitoral adhesions, respectively. In the study group, 14% presented with clitorodynia. Risk factors included a history of sexual pain, yeast infection, urinary tract infection, blunt perineal or genital trauma, lichen sclerosus, low calculated free testosterone, and other sexual dysfunctions including persistent genital arousal disorder.

Conclusion: Women with sexual dysfunction should routinely undergo clitoral physical examination. If the glans corona is not fully visualized, then clitoral adhesions should be suspected. Education, counseling, and/or referral for sexual pain management should be considered. **Aerts L, Rubin RS, Randazzo M, et al. Retrospective Study of the Prevalence and Risk Factors of Clitoral Adhesions: Women's Health Providers Should Routinely Examine the Glans Clitoris. Sex Med 2018;XX:XXX–XXX.**

Key Words: Clitoral Adhesion; Glans Clitoris; Vulvoscopy; Corona; Clitorodynia

INTRODUCTION

The glans clitoris is covered by the prepuce that normally moves freely over the surface of the glans and can be retracted beyond the glans corona to the balanopreputial sulcus of the clitoris. This sulcus has its specific moistening system consisting of balanopreputial eccrine glands.[1] The size, thickness, and configuration of the prepuce vary greatly among individuals.[2] The glans clitoris is very sensitive during sexual activity and this sensitivity can be objectively measured.[3]

We have observed women presenting to our sexual medicine clinic with clitoral adhesions, documented during physical

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[1]Obstetrics and Gynecology, Geneva University Hospitals, Geneva, Switzerland;

[2]Private Practice, Washington, DC, USA;

[3]San Diego Sexual Medicine, San Diego, CA, USA;

[4]Sexual Medicine, Alvarado Hospital, San Diego, CA, USA

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examination by failure to visualize the entire glans corona and recorded by vulvoscopy with photography. Clitoral adhesions present as preputial skin that physically adheres to the glans clitoris at 1 or more points distal to the balanopreputial sulcus, such that the prepuce is no longer freely retractable over the entire surface of the glans during physical examination. There is a spectrum of clitoral adhesions, ranging from mild to severe, but in all cases of adhesions, there is a closed compartment covering some portion of the glans corona.

The closed compartment space under the clitoral adhesions can prevent adequate drainage of keratinaceous desquamation. Smegma and squamous cells can accumulate underneath the prepuce resulting in smegmatic pseudocysts and/or keratin pearls, in which squamous cells actually form concentric layers and result in several millimeter-sized masses. Thus, the closed compartment between the prepuce and the clitoris can become irritated, erythematous, or infected.[4] Any of these changes can be associated with a persistent foreign body sensation (described as similar to grains of sand in the eye), balanitis, discomfort, hypersensitivity, clitorodynia sexual pain disorder, and even persistent genital arousal disorder (PGAD). The exact cause of the clitoral adhesion in a specific patient usually cannot be identified.[5,6]

In our sexual medicine clinic, it is expected that patients with sexual health complaints will undergo a detailed genital physical examination including a detailed and systematic examination of the vulva using vulvoscopy magnification and photography.[7] Thus, we appeared to be in a unique clinical environment to expand the limited clinical data that exist on the prevalence and risk factors of the specific clitoral pathology of clitoral adhesions. In particular, we wished to know answers to the following questions: What is the prevalence of adhesions of the adjacent prepuce to the glans clitoris in a clinical population? In women with clitoral adhesions, what is the likelihood of clitoral adhesions causing clitoral pain or clitorodynia? What are the risk factors for clitoral adhesions? It was the goal of this retrospective clinical research study to address these questions.

METHODS

This retrospective research study was approved by the institutional review board. For women who present for assessment of their female sexual dysfunction, it is routine in our multidisciplinary sexual medicine practice to obtain consent to perform a detailed sexual history and administer a battery of patient questionnaires, including the Female Sexual Function Index (FSFI), the Sexual Distress Scale—Revised, the Perceived Stress Scale, the Personal Health Questionnaire, the McGill Genital Pain Questionnaire, and the Vulvar Pain Questionnaire (V-Q). In addition, blood tests are performed, including total testosterone, sex hormone binding globulin, estradiol, and calculated free testosterone.

It also is routine in our practice to perform a standardized optically magnified vulvoscopy examination with photography. We use Wallach ZoomScope vulvoscopy (Wallach Surgical Devices, Trumbull, CT, USA) with an attached foot-pedal—controlled Cannon EOS XSi Digital SLR camera (Canon, Shimomaruko Ota-Ku, Japan), which links to a light-emitting diode monitor so the patient and her partner can observe the vulvoscopy findings in real time.[7] At the end of each day, the images are transferred to a file in an encrypted computer in our office. The only photo identification is the date and time the photos were taken.

During the vulvoscopy examination, a standard operating procedure is followed. Physical examination is performed of the (i) skin overlying the right and left labia majora, right and left labia minora, and the sulcus between the 2 labia; (ii) the glans clitoris and prepuce; (iii) the urethral meatus; (iv) the vestibule between the Hart line and hymen, especially the vestibular glands at the 1:00 and 11:00 o'clock positions; and (v) the vagina, especially the anterior vaginal wall and cervix, and assessment for the presence or absence of vaginal rugae. During vulvoscopy, the clitoral glans is specifically assessed using gentle bilateral cephalad preputial retraction. The clitoris and preputial region are examined for the (i) size of the glans clitoris compared with the cotton swab, (ii) presence or absence of the corona of the glans, (iii) presence of clitoral adhesions with underlying keratin pearls and/or smegma, and (iv) presence of clitoral pain, hypersensitivity, or discomfort.

The primary goal of this study was to determine the prevalence of glans clitoral adhesions in a single sexual medicine practice. To achieve this, we examined our large collection of vulvoscopy photos, taken over an 8-year 6-month period from August 2007 to December 2015. The criteria for inclusion of each vulvoscopy photograph were (i) good photographic focus of the glans clitoris and (ii) the presence of appropriate manual cephalad preputial retraction that allowed for full visualization of the glans corona.

Clitoral adhesions were recorded as absent when the prepuce could be retracted to the balanopreputial sulcus and the full corona was visualized (Figure 1). In contrast, when the vulvoscopy photograph showed an inability to fully expose the glans clitoris, the woman was identified as having clitoral adhesions and thereby entered into the study group. The following classification was used to estimate the degree of clitoral adhesion: (i) mild clitoral adhesions were defined as more than 75% of the surface of the glans clitoris exposed and the corona was not visualized; (ii) moderate clitoral adhesions were defined as 25% to 75% of the surface of the glans clitoris exposed and the corona was not visualized; and (iii) severe clitoral adhesions were defined as less than 25% of the surface of the glans clitoris exposed and the corona was not visualized (Figure 2).

2 independent reviewers, at different times, evaluated the vulvoscopy photographs: one was a gynecologist (L.A.) and the other was a sexual medicine fellow (R.R.). For any discrepancy between the 2 reviewers for the absence or degree of clitoral adhesions, the photograph was re-evaluated until a consensus was reached.