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Bilateral Accessory Breast Tissue of the Vulva: A Case Report Introducing a Novel Labiaplasty Technique

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INTRODUCTION

Labiaplasty is becoming an increasingly frequent cosmetic procedure, and the popularity of brief didactic labiaplasty courses has risen in response to consumer demand. There is a paucity of detailed anatomic description of female sensory innervation patterns to the clitoris and surrounding structures. In fact, much of what is known is extrapolated from a rather limited understanding of male anatomy. This places patients at risk for denervation of the clitoral structures during labiaplasty procedures. Our novel technique proposes a method of pre-operative individualized patient neurosensory mapping that allows for surgical planning to avoid injury to the sensory innervation of the clitoris and surrounding structures.

As labiaplasty becomes more common, it is important to approach labiaplasty patients with a detailed understanding of the sensory innervation of the clitoris and surrounding structures, in order to avoid nerve injury and resultant sexual dysfunction. Traditional labiaplasty approaches fail to accommodate the variations in sensory innervation patterns of the vulva and clitoral complex (clitoral glans and hood). Our novel approach to pre-operative clitoral nerve sensory mapping provides an alternative method of labiaplasty that may avoid denervation injury.

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Case Report

A 23 year-old African American female presented with bilateral labial swelling that developed in the second trimester of pregnancy, and failed to resolve postpartum. The labial swelling began at approximately 20 weeks gestation, and progressively increased in size, forming bilateral labial masses. The masses were compressible, soft and non-tender. She was initially managed with observation. At her 6-week postpartum visit, she reported a modest reduction in swelling. Given her postpartum and asymptomatic status (pain free and no dyspareunia) she was encouraged to wait an additional three months. She was subsequently referred to our center for evaluation of persistent labial masses.

Upon examination, the masses were noted to be arising from the labium minora/clitoral hood complex and not the labia majora (Figures 1, 2, 3). Unlike the labia majora, integument of the clitoral hood and labium minora is comprised of non-hair bearing epithelium¹. On exam, the pendulous sacs were devoid of hair bearing skin, consistent with labia majora. (Figure 1) Additionally, the weight of the masses and resulting traction had led to convergence of anatomical spaces that previously delineated the clitoral hood from the labia minora. (Figures 2, 3) As such, our surgical approach needed to be modified in order to avoid trauma to the clitoral region. This case posed a particular challenge since the clitoral complex was not visible and could not be delineated from the labia minora (Figures 2, 3). What follows is a discussion of our approach and the key points of consideration in planning and execution of reconstructive procedures in the vulvar region using this prototypical case.

The neurosensory anatomical landmarks of regions associated with female sexuality and arousal are not well characterized. However, extrapolating from our knowledge in men, we can speculate that preservation of the dorsal clitoral nerve is important in avoiding sensory nerve damage to the peri-clitoral region.

Pre-operative Planning and Sensory Nerve Mapping

Prior to making incisions, sensory mapping was performed in order to delineate the anatomical region associated with sexual response. (Figures 3, 4) Using a lubricated cotton swab, the undersides of the labial masses were stroked in a radial fashion, starting from the urethra outward. With each stroke the patient was asked to indicate if the stroking sensation was 'sensual' vs. 'neutral.' In order to orient the patient, we first stroked the uninvolved posterior labia so that the patient had a perceptual anchor to 'neutral' sensation. Figure 3 shows the mucosal erogenous zone delineated in this manner. Subsequently, the incision lines were marked with deference to the following principles: 1) avoiding the midline in order to eliminate trauma to the clitoral bundle, 2) avoiding incisions in the mucosal surface area surrounding the clitoris which, in our experience, is homologous to the ventral glans penis with respect to sensitivity, and lastly 3) accounting for significant tissue retraction over time particularly in the midline (Figures 3, 5, 6).

Description of Procedure

With the above principles in mind, an 'ear muff' incision line was marked. (Figure 4) The incision was carried out in a conventional manner and the typical globular tissue consistent

with heterotopic breast was encountered. Additional lobules were identified superiorly along the margin of the pubic symphysis (Figures 5, 7). The dissection was carried out superficially along scarpas fascia in order to remove ectopic breast tissue. Due to extensive superficial dissection, a drain was left in place at the completion of the procedure (Figure 5). The final pathology report showed benign heterotopic breast tissue with cystically dilated ducts.

The post-operative period was unremarkable. Figure 6 is taken 5 months post-operatively, and shows significant labial reduction along with the re-establishment of normal anatomical relationships and space between the clitoral hood and labia minora.

Discussion

Ectopic breast tissue is used to describe all types of breast tissue found outside of “two normally situated pectoral breasts.”² Histologically similar to normal breast tissue, ectopic breast tissue is hormonally responsive and subject to pathologic changes such as fibrocystic disease and fibroadenoma². Rarely, ectopic breast tissue can present in the vulvar region. To our knowledge, this is the first report on surgical management of ectopic tissue involving the clitoral region.³⁻⁹ The principles reviewed in this report are applicable to surgical planning in the vulvar region, especially as it pertains to labiaplasty.

Surgical intervention in the vulvar region is complicated by the complexity of vulvar and clitoral sensory innervation. In the current case, the proximity of the lesions to the highly innervated clitoral region necessitated sensory preservation of the dorsal clitoral nerve. Without sensory conservation with preoperative sensory mapping, resection of the sensual clitoral tissue posed a risk of resultant sexual dysfunction. Detailed sensory mapping is achieved by the stimulation of the skin with the soft end of a cotton swab in order to delineate the “sensual area.” In our experience, the sensual region in most instances involves the vulvar mucosa and the mucocutaneous junction between the clitoris anteriorly and the urethra posteriorly. In addition to being sensitive, this region is highly elastic and contracts significantly. Figures 3, 5 and 6 demonstrate the extent of tissue elasticity and contraction in our patient. A 6 cm length of skin (Figure 3) was reduced to a length of 4 cm immediately post-operatively (Figure 5), and 2.5 cm at 5 months (Figure 6).

Inter-connectedness of vulvar and labial skin folds need to be considered in surgical planning. As demonstrated in this case, masses in the clitoral region can lead to ‘flattening’ of the anatomical ridges separating the labium minora from the clitoral complex. However, in this case, targeted reduction of the mass was associated with spontaneous re-establishment of these anatomical lines (Figure 6).

Here we have reviewed surgical considerations in vulvar surgery using a prototypical case of ectopic breast tissue of the clitoral hood and labium minora. The challenges of this case were twofold, and were due to both the large size of the masses, with resultant distortion of normal anatomy, as well as the clitoral location of the masses. Because of these variations in anatomy, we had to design a method of extirpation and reconstruction that would preserve clitoral sensation, while avoiding disruption of sensory innervation to the clitoral complex.

Unfortunately, little is known about the sensory pathways of the clitoral complex and surrounding vulvar and labial structures. Therefore, we devised a novel sensory mapping technique to aid in pre-operative planning and incisional marking. Traditional labiaplasty approaches include incisions in an inverted-U shape, which violate the innervation of the clitoral complex. This has resulted in our observation of patients with sexual dysfunction as a result of sensory loss to critical areas of female sexual function.

Exceedingly, plastic and reconstructive surgeons are consulted in surgical management of vulvo-vaginal disorders, ranging from reconstruction following malignancy to aesthetic labiaplasty. Regardless of the indication, we have provided a meaningful overview of the principles involved in female genital reconstruction, with a specific focus on prevention of sensory loss in the clitoral and vulvar region. The ‘best practices’ in female genital surgery and reconstruction in women are unknown and remain in dire need of research and investigation.

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Figure 1.
Masses arising from the labium minora/clitoral hood complex and not the labia majora.
Masses were devoid of hair bearing skin, consistent with labia majora.

Figure 2.
The weight of the masses and resulting traction had led to convergence of anatomical spaces that previously delineated the clitoral hood from the labia minora.

Figure 3.
The clitoral complex was not visible and could not be delineated from the labia minora. Skin length is 6 cm.

Figure 4. Pre-operative sensory mapping was performed in order to delineate the anatomical region associated with sexual response. An ‘ear muff’ incision line was marked.

Figure 5. Additional lobules were identified superiorly along the margin of the pubic symphysis. Post-operative skin contraction, with skin length reduced to 4 cm.

Figure 6. 5 months post-operatively, and shows significant labial reduction along with the re-establishment of normal anatomical relationships and space between the clitoral hood and labia minora.

Figure 7.
Additional lobules were identified superiorly along the margin of the pubic symphysis.