

Bilateral Accessory Breast Tissue of the Vulva

A Case Report Introducing a Novel Labiaplasty Technique

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Introduction: We present the case of a 23-year-old female with bilateral ectopic breast tissue of the vulva, the repair of which necessitated a novel labiaplasty technique. 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.

This places patients at risk for denervation of clitoral structures during labiaplasty procedures. Our novel technique proposes a method of individualized patient neurosensory mapping preoperatively, which allows for surgical planning to avoid injury to the sensory branches of the dorsal clitoral nerve.

Methods: A 23-year-old female presented with bilateral vulvar masses that involved the clitoral complex, which had first become apparent during the second trimester of pregnancy, and failed to resolve in the postpartum period. We describe the preoperative planning and intraoperative approach and dissection to labiaplasty in this patient, which was complex given the size of the masses, and specifically designed to avoid injury to sensory branches of the dorsal clitoral nerve.

Discussion: 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, to avoid nerve injury and resultant sexual dysfunction. Traditional labiaplasty approaches may violate the sensory innervation patterns of the clitoral region, thus causing a sensory loss that affects patient sexual function. Our novel approach to preoperative clitoral nerve sensory mapping provides an alternative method of labiaplasty that may avoid denervation injury.

Key Words: labiaplasty, labiaplasty, dorsal clitoral nerve, clitoral sensory innervation (Ann Plast Surg 2012;00: 00Y00)

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 preoperative 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, 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 preoperative clitoral nerve sensory mapping provides an alternative method of labiaplasty that may avoid denervation injury.

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 nontender. 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 3 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 (Figs. 1Y3). Unlike the

labia majora, integument of the clitoral hood F1_F3 and labium minora is comprised of nonYhair-bearing epithelium.¹ On examination, the pendulous sacs were devoid of hair-bearing skin, consistent with labia majora (Fig. 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 (Figs. 2 and 3). As such, our surgical approach needed to be modified to avoid trauma to the clitoral region. This case posed a particular challenge because the clitoral complex was not visible and could not be delineated from the labia minora (Figs. 2 and 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 periclitoral region.

Preoperative Planning and Sensory Nerve Mapping

Before making incisions, sensory mapping was performed to delineate the anatomical region associated with sexual response (Figs. 3 and 4). Using a lubricated cotton swab, the undersides of the F4 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” versus “neutral.” 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 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 (Figs. 3, 5, and 6). F5 F6



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.*

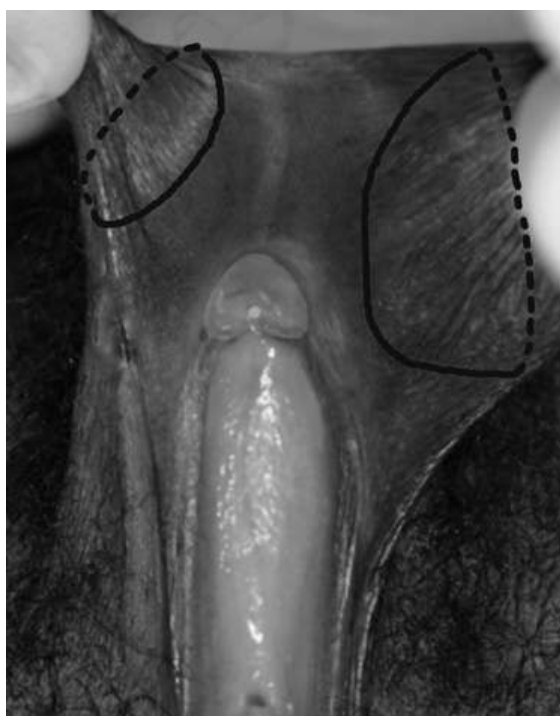


FIGURE 2. *The weight of the masses and resulting traction had led to convergence of anatomical spaces that previously delineated the clitoral hood from the labia minora.*



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

Description of Procedure

With the previously mentioned principles in mind, an “ear muff” incision line was marked (Fig. 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 (Figs. 5 and 7). The dissection was carried out superficially along Scarpa



FIGURE 4. Preoperative sensory mapping was performed 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. Postoperative skin contraction, with skin length reduced to 4 cm. fascia to remove ectopic breast tissue. Because of extensive superficial dissection, a drain was left in place at the completion of the procedure (Fig. 5). The final pathology report showed benign heterotopic breast tissue with cystically dilated ducts.

The postoperative period was unremarkable. Figure 6 is taken 5 months postoperatively, and shows significant labial reduction along with the reestablishment 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 “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 fibroadenoma.² Rarely, ectopic breast tissue



FIGURE 6. Five months postoperatively, and shows significant labial reduction along with the reestablishment of normal anatomical relationships and space between the clitoral hood and labia minora.

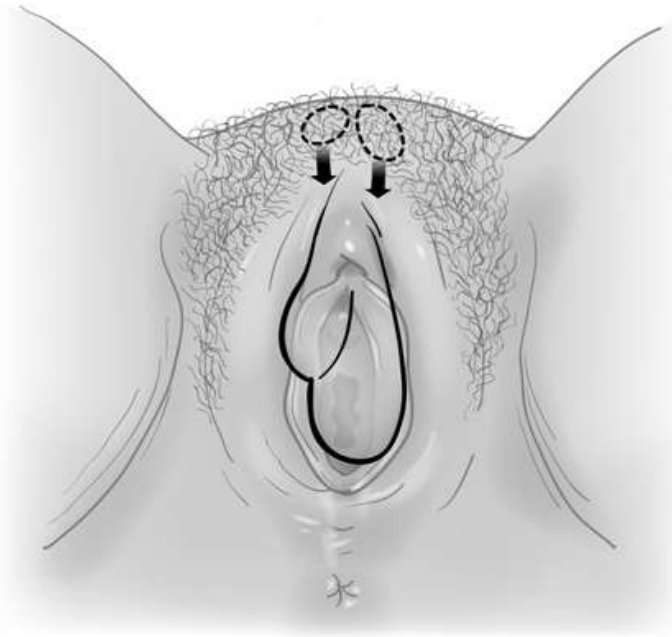


FIGURE 7. Additional lobules were identified superiorly along the margin of the pubic symphysis.

can present in the vulvar region. To our knowledge, this is the first report on surgical management of ectopic tissue involving the clitoral region.^{3Y9} 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 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 (Fig. 3) was reduced to a length of 4 cm immediately postoperatively (Fig. 5), and 2.5 cm at 5 months (Fig. 6).

Interconnectedness of vulvar and labial skin folds needs 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 reestablishment of these anatomical lines (Fig. 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 2-fold 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 preoperative 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 because of sensory loss to critical areas of female sexual function.

Exceedingly, plastic and reconstructive surgeons are consulted in surgical management of vulvovaginal disorders, ranging from reconstruction after 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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