First Female-to-Male Facial Confirmation Surgery with Description of a New Procedure for Masculinization of the Thyroid Cartilage (Adam's Apple)

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Summary: Although male-to-female transgender patients commonly seek facial feminization surgery, facial masculinization surgery in the female-to-male transgender population is unreported in the literature. This report documents the first known female-to-male facial masculinization surgery, including a new technique for creating an "Adam's apple" to enhance the facial masculine appearance of a natal female. The authors "reversed" the methods typically used to feminize male facial features, and modified the forehead, nose, and chin to masculinize the patient's natal female facial features. The authors devised a novel technique to augment the thyroid cartilage using autologous rib cartilage to create a visible Adam's apple. Initially, masculinization of the chin was accomplished with a multisegment chin osteotomy with grafts to vertically expand and widen the chin along with correcting pronounced microgenia. Subsequently, a second facial masculinization procedure was performed to masculinize the forehead, nose, and thyroid cartilage. Rib cartilage was harvested and carved into an appropriately shaped thyroid cartilage onlay graft and then attached and integrated with the native thyroid cartilage, creating a fully mobile cartilage that translocates up and down with swallowing and a visible Adam's apple. Previously described techniques to masculinize the facial features of natal male patients were adapted to masculinize the female-to-male patient. Those procedures were combined with the novel technique to create a visually perceptible and naturally mobile Adam's apple in the female-to-male transsexual patient. Collectively, these described procedures can now provide most female-to-male transsexual patients with a satisfying transformation of their facial features. (*Plast. Reconstr. Surg.* 139: 883e, 2017.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, V.

Current estimates place the incidence of transgenderism at approximately 300 per 100,000.[1] This estimate is vastly higher than originally described in early articles, and indicates there may be up to 1 million gender-dysphoric individuals in the United States alone.[2] In 2011, the World Professional Association for Transgender Health cited the prevalence of male-to-female transsexualism in the range of one per 11,900 to one per 45,000 and female-to-male transsexualism in the range of one per 30,400 to one per 200,000. Scholars Olyslager and Conway estimate the prevalence to be much higher at one per 5500 to one per 8000, respectively.[3]

One of the authors, Douglas K. Ousterhout, M.D., D.D.S., has performed six masculinization procedures and published his techniques in 2011.[4] Those patients were all cisgender men seeking to appear more masculine. Our literature review does not identify any prior reports

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of female-to-male transsexuals undergoing facial masculinization surgery.

We recently performed the first reported facial masculinization surgery for a female-to-male transgender patient. In addition, we developed a new procedure to augment the thyroid cartilage to more completely masculinize the head and neck features of female-to-male transsexuals.

The most common request we receive regarding facial feminization surgery is for feminization of the forehead and nose. The second most common request is for feminization of the chin and reduction of the thyroid cartilage.

For this patient, we recommended to him that we reverse those procedures and instead masculinize the forehead, nose, and chin. Based on the patient's desire to have a visible and mobile "Adam's apple," we also discussed options for augmenting the thyroid cartilage. We devised a novel technique using autologous rib cartilage to create a visible Adam's apple. The addition of the Adam's apple assists in creating a masculine appearance.

SURGICAL TECHNIQUE

The patient underwent augmentation of the forehead using methylmethacrylate as described by Ousterhout.[5] A coronal incision was used to access the forehead. We harvested a large piece of deep temporal fascia to serve as a conduit for diced cartilage augmentation of the dorsum of the nose.

We harvested septal cartilage during the submucosal resection of the septum. The cartilage was then diced into small granules and injected into a deep temporal fascia conduit.[6] We inserted the conduit through an open rhinoplasty approach to increase dorsal projection. Using a technique previously described by the senior author (D.K.O.) for masculinization of the male chin,[7] we performed masculinization of the patient's chin with a segmental chin osteotomy with vertical and horizontal expansion of the chin along with bone graft and hydroxyapatite granule implant.[8]

AUGMENTATION OF THE THYROID CARTILAGE

The operation was performed under general anesthesia. The face, neck, and chest were prepared. We began by injecting both the rib and the submental area with 1% lidocaine with 1:100,000 epinephrine solution. We marked a 3-cm transverse incision approximately 1 cm behind the submental crease (Fig. 1). Once the incision was made, we used sharp dissecting scissors to elevate the skin and fat off of the platysma and midline structures beyond the level of the thyroid cartilage. Lighted magnification is helpful for good visualization. A vertical incision was made between the strap muscles covering the cartilage until the cartilage was visualized. We then incised the perichondrium and dissected the anterior surface of the cartilage.

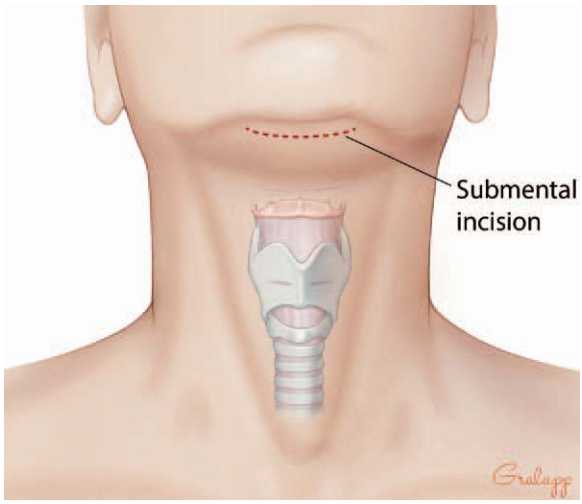

Fig. 1. Anatomical illustration of location of submental incision to access the thyroid cartilage. (Printed with permission from © Christine Gralapp Medical Illustration.)

We made an incision 6 cm long over the medial portion of the inframammary crease. Female-to-male transgender patients will often have undergone some form of mastectomy, and the same incision should be used. We then harvested cartilaginous rib using a standard technique with care taken not to violate the pleura. The harvested rib should be full thickness and 3 cm long to have a sufficient amount of cartilage for the graft.

A carving block and a no. 11 blade scalpel were used to shape the cartilage into an anatomically correct male thyroid cartilage (Fig. 2). The shape should be a narrow oblique pyramid with the base roughly three-fourths of the width of the existing thyroid cartilage. This dimension is mostly for stability of the cartilage, as it will be coapted to the native cartilage. We assessed the height of the cartilage by placing the framework of the cartilage over the existing thyroid cartilage and palpating and visualizing the result. It is best to create the initial cartilage framework slightly larger than anticipated, and to reduce

Fig. 2. Intraoperative view of shaped rib cartilage.

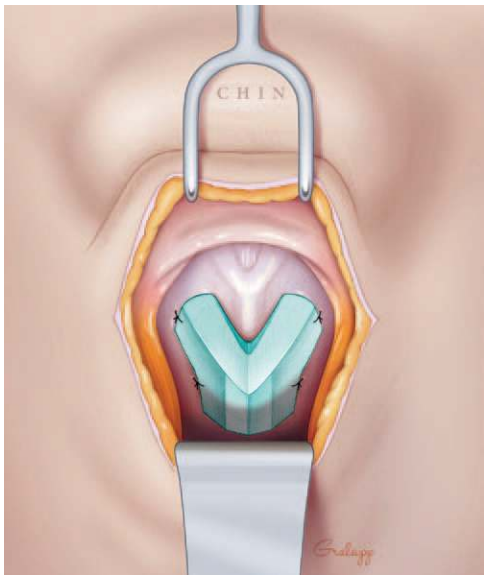

Fig. 3. Anatomical illustration of rib graft secured on top of existing thyroid cartilage with two sutures on each side. (Printed with permission from © Christine Gralapp Medical Illustration.)

the size incrementally until the optimal configuration is achieved.

After the cartilage graft was satisfactorily shaped, we secured it to the existing cartilage using permanent suture (Figs. 3 and 4). Depending on the height of the patient's native larynx, one may choose to either raise or lower the position of the graft to appear appropriate when viewed from profile. We then closed the platysma over the cartilage and performed the skin closure. It is not possible to attain perichondrial closure over the cartilage and no attempt was made to do so. We did not use a drain. A

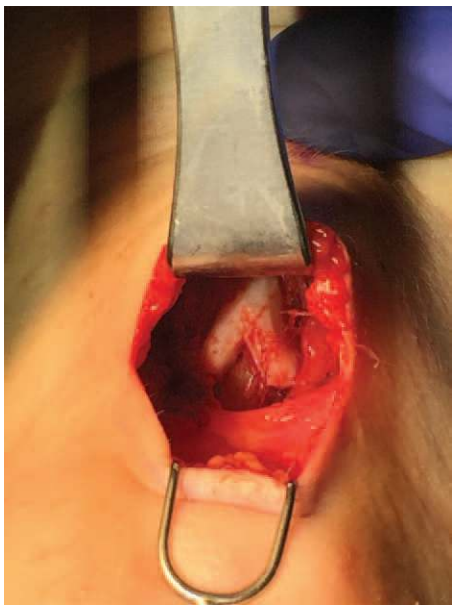

Fig. 4. Intraoperative view of rib cartilage in place overlying thyroid cartilage.

chest radiograph should always obtained to ensure there is no pneumothorax. On confirmation that there is no pleural leak, the patient is allowed to go home.

DISCUSSION

A prominent thyroid cartilage is one of the many stigmata that male-to-female transsexuals face. Although we have masculinized the faces of six cisgender men, we now describe a new technique applied to the first female-to-male transsexual to undergo masculinization. The starting point for surgical masculinization of the face is, in effect, the opposite of those procedures used to feminize a face.

The male thyroid cartilage is fairly variable. We note this from personal experience. It often protrudes 5 to 6 mm beyond the trachea. Augmentation of the thyroid cartilage to this size gives the patient a mobile, characteristically masculine Adam's apple.

At 6-month follow-up, this patient maintained his result in terms of size and motion. There was no evidence of cartilage resorption or dislodgement. The cartilage was noted to be adherent to the underlying larynx and mobile with swallowing and speaking.

CONCLUSIONS

We present the first female-to-male facial masculinization surgery along with a new procedure

Fig. 5. (*Left*) Preoperative photograph of first female-to-male transsexual patient who underwent several facial masculinizing procedures, including thyroid cartilage augmentation. (*Right*) Postoperative photograph illustrating a now prominent tracheal cartilage on front view with neck in extension.

Fig. 6. Profile view, before rib cartilage augmentation of the thyroid cartilage.

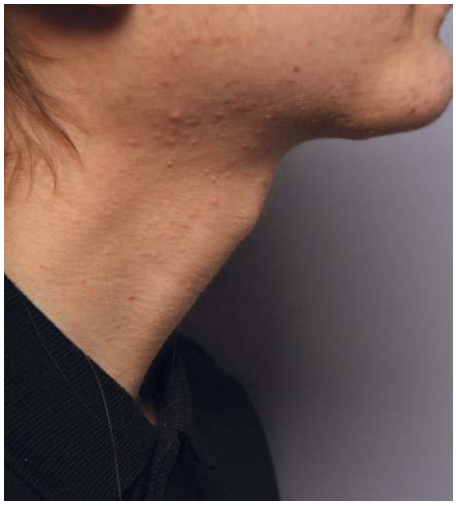

Fig. 7. Profile view, after (3 months postoperatively) rib cartilage augmentation of the thyroid cartilage.

for creation of a prominent thyroid cartilage. Our patient expressed satisfaction with the results of his facial masculinization, including thyroid cartilage augmentation (Figs. 5 through 7). In the hands of an experienced surgeon, this procedure is safe and effective in achieving the patient's goals, and presents little downtime for patients seeking gender congruence of their facial features.

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PATIENT CONSENT

This procedure does not have institutional review board clearance because it is associated with a private practice; however, the procedure does conform to the Declaration of Helsinki. Our patient described in this article was completely aware and fully informed of the unique and novel nature of this procedure and gave written and verbal consent. Patient provided written consent for the use of the patient's images.

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