

# Aesthetic Chondrolaryngoplasty in Transgender Women

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**Abstract:** A prominent thyroid cartilage is a typical male feature. Its reduction can achieve a female appearance of the neck in transgender women. The laryngeal prominence and notch area are gradually exposed as necessary under general anaesthesia, through an incision in the cervicomental angle. The cartilage is gradually reducing as planned. The wound is closed in layers. Chondrolaryngoplasty was done in 18 patients. No serious complications were observed in the patients. The aesthetic outcome was satisfactory in all patients. Chondrolaryngoplasty is well tolerated and effective procedure to reduce the thyroid cartilage and feminize the neck contour in transgender women.

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## Introduction

Thyroid cartilage is part of the larynx. The male larynx and, in particular, the thyroid cartilage grows in puberty (Cohen et al., 2018). The cartilage is composed of the right and left lamina which are joined in the front and continue in the dorsolateral direction. The front angle of both laminae is approximately 90° in males and about 120° in females. A round edge – laryngeal prominence – is formed in the front where both laminae meet. In males, the larynx protrudes in the neck with its laryngeal prominence. The larynx does not protrude in females (Čihák, 2013). Aesthetic chondrolaryngoplasty is a surgical procedure that reduces the prominence of the thyroid cartilage (Cohen et al., 2018).

Chondrolaryngoplasty was first described by Wolfort and Parry (1975), and the technique was further specified by Wolfort et al. (1990). Conrad and Yoskovitch (2003) then Spiegel and Rodriguez (2008) used an endoscope and a needle, which they insert through the cartilage to visualize the location of the anterior commissure. Khafif et al. (2020) introduced computed tomography of neck and larynx into the preoperative examination to measure the distance between vocal cords and external thyroid cartilage.

The true vocal cords meet medially at the anterior commissure which attaches to the inside laminae of the thyroid cartilage in the midline, at approximately

half way up the height of the cartilage (von Lanz and Wachsmuth, 1955; Conrad and Yoskovitch, 2003).

We present the group of 18 transgender women (male-to-female) with protruding thyroid cartilage. We also present our standard surgical procedure.

## Patients and Method

### Patients

Between January of 2016 and December of 2019, we performed chondrolaryngoplasty in 18 patients. The average age of these patients was 36 years (range, 25–51 years).

### Technique

A horizontal incision, approximately 2 cm long, is made at the place of the natural crease in the area of the cervicomenal angle, under general anaesthesia using endotracheal intubation. After dissection of the muscles and their lateral shifting, the perichondrium is cut; the perichondrium is then partially dissected from the outer and inner side of the cartilage. The laryngeal prominence and notch area are gradually exposed as necessary. A point at half height is marked. The cartilage is removed using a scalpel and a round diamond cutter to an extent that makes sure the vocal cords remain undamaged. Bleeding is carefully controlled with a bipolar cautery. The perichondrium is sutured using an absorbable material; the strap

**Table 1: Clinical date**

Patient	Age	Procedures at one time	Other procedures
1	38	chondrolaryngoplasty	
2	25	chondrolaryngoplasty	
3	47	chondrolaryngoplasty	
4	32	chondrolaryngoplasty	
5	39	chondrolaryngoplasty, genioplasty	rhinoplasty
6	42	chondrolaryngoplasty	
7	32	chondrolaryngoplasty, genioplasty	rhinoplasty, lip lift
8	33	chondrolaryngoplasty	rhinoplasty
9	31	chondrolaryngoplasty	
10	27	chondrolaryngoplasty, genioplasty, forehead contouring	rhinoplasty
11	51	chondrolaryngoplasty, genioplasty	
12	42	chondrolaryngoplasty	rhinoplasty, forehead contouring, genioplasty
13	35	chondrolaryngoplasty, genioplasty, mandibular angle reduction	rhinoplasty
14	32	chondrolaryngoplasty, genioplasty, mandibular angle reduction	rhinoplasty, forehead contouring
15	34	chondrolaryngoplasty, genioplasty	
16	45	chondrolaryngoplasty	
17	29	chondrolaryngoplasty	rhinoplasty, forehead contouring
18	36	chondrolaryngoplasty	

muscles are reapproximated in the midline. The wound is closed in layers.

Antibiotics are administered in the perioperative period. A single intravenous corticosteroid dose is administered at the end of the procedure.

## Results

Of the 18 patients, 8 patients had only chondrolaryngoplasty. Additional facial feminization surgery was done together with chondrolaryngoplasty in 7 cases. Additional facial surgery in the scope of feminization was done as a separate procedure in 3 cases (primarily only chondrolaryngoplasty). A total of 8 patients from this group underwent additional procedures (Table 1). No serious postoperative complications (characterised as changed voice) were observed in our patient group. The aesthetic outcome was satisfactory in all patients (Figure 1).

## Discussion

A prominent thyroid cartilage is a typical male feature (Altman, 2012). Chondrolaryngoplasty is a safe and effective surgical procedure that can improve the neck appearance in transgender women (Lipschitz et al., 2017).

The extent of cartilage reduction is limited by the vocal cords attachment (Lipschitz et al., 2017). In connection with this procedure, it is necessary to balance aesthetic effect and function. With a conservative reduction, the patient may be dissatisfied after surgery; on the other hand, overresection can destabilize the anterior commissure tendo and change the voice (Cohen et al., 2018).

Wolfort et al. (1990) described that on the inside of laminae, the perichondrium and the thyrohyoid membrane are elevated to the level of the thyroepiglottic ligament.

As reported by Altman (2012), complication is rare. The risks of the surgery include a potential injury to the vocal cords and destabilization of the epiglottis (Altman, 2012). Injury to the anterior commissure can destabilize the vocal cords, thereby producing irreversible voice change (Spiegel and Rodriguez, 2008).

As found by Cohen et al. (2018) in connection with the thyroepiglottic ligament based on intraoperative observation, the tracheal shave procedure does disrupt this attachment without reported postoperative dysphagia or aspiration.

Over the years, there have been increasing reports of the use of endoscopic visualisation of vocal cords and translaryngeal introduction of a needle to identify the level of anterior commissure, including presentation of results. The authors report a more radical and safe reduction and optimization of the results of the thyroid cartilage surgery in relation to this method (Spiegel and Rodriguez, 2008; Jazayeri et al., 2022; Vandenberg et al., 2023).

Chondrolaryngoplasty can be performed under local anesthesia (Altman, 2012) or local anesthesia with sedation (Spiegel and Rodriguez, 2008). Wolfort et al. (1990) described the surgery under general anesthesia using endotracheal intubation. Spiegel and Rodriguez (2008) under general anesthesia, used the laryngeal mask airway.

Surgery performed under general anesthesia using endotracheal intubation is preferred at our sites. The surgery is performed either separately or in combination with other feminization interventions. The cervicomental angle access localized in the crease



Figure 1: Result of chondrolaryngoplasty. A 32-year-old male-to-female: A) preoperative; B) 5-years postoperative. The patient also underwent a chin reduction.

is normally used. This approach provides a good view of the reduced part of the cartilage. The resulting scar is aesthetically satisfactory. A certain problem may be faced in cases, as reported by Cohen et al. (2018), where the angle is not as distinct and cannot hide the scar to a sufficient extent.

Ihnat et al. (2024) recommend locating the scar submentally, where it is less obvious. Khaffif et al. (2020) recently described a novel technique for scarless chondrolaryngoplasty, transoral endoscopic vestibular approach and to report the results.

We did not observe any serious complications characterised as an injury to the vocal cords in our patients. Chondrolaryngoplasty can be performed alone or safely combined with other types of facial feminization surgery.

## Conclusion

Aesthetic chondrolaryngoplasty is well tolerated and effective procedure to reduce the prominence of the thyroid cartilage. Patients should be aware that the extent of cartilage reduction is limited by anatomical structures and that the radicality of the procedure is limited, particularly with respect to voice preservation.

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