



RELAXATION THYROPLASTY – A CLASSICAL SURGICAL APPROACH FOR PUBERPHONIA

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Abstract:

The persistence of adolescent voice even after puberty in the absence of organic cause is known as puberphonia.^{1,2,3} The condition is commonly seen in males.¹⁻⁷ This case report illustrates a novel surgical method “Retrusion thyroplasty” in the management of puberphonia.

Introduction:

The persistence of adolescent voice even after puberty in the absence of organic cause is known as puberphonia.^{1,2,3} The condition is commonly seen in males.¹⁻⁷ Normally adolescent males undergo voice changes due to sudden increase in length of vocal cords due to enlargement of thyroid prominence (Adam’s apple). This is uncommon in females because their vocal cords do not show sudden increase in length. This sudden increase in length of vocal cords is due to sudden increase in testosterone levels found in pubescent males.^{1,4} Children reach puberty around 12 years of age when their hormone levels begin to become elevated. In males, this is also the age when their larynx has a rapid increase in size. The vocal cords become longer and begin to vibrate at a lower pitch (or frequency). This explains why most males go through the period of voice breaks. The vocal cords are trying to adjust to their new dimensions. No such laryngeal changes take place in females who continue using a high pitched voice.

According to Banerjee the incidence of puberphonia in india is about 1 in 9,00,000 population.^{2,5,6} Even though the incidence is low, for a individual it causes social and psychological embarrassment.

In infants laryngotracheal complex lies at a higher level. It gradually descends. During puberty in males the descent is rapid, the larynx becoming larger and unstable and on top of it the brain is more accustomed to infant voice. The boy may hence continue using high pitched voice even after puberty or it may break into higher and lower pitches.^{1,5}

Case Report:

23 years old male came to ENT OPD Stanley medical college and hospital with complaints of persistence of adolescent voice since childhood. There was an inability to raise his voice. And he complained of voice fatigue. He was psychologically depressed due to social embarrassment.

On examination his adam’s apple was prominent. Laryngeal contour normal. Gutzmann pressure test (external downward pressure on the thyroid cartilage will often evoke normal sounding voice) was positive. Secondary sexual characters developed normally. Psychological evaluation shows the patient was psychologically disturbed. He attempted suicide once due to social embarrassment. After that incident he came to our OPD. Psychological counselling was given to improve his quality of life. Initially he was referred to speech therapist and completed a course of voice therapy.

But he did not show any improvement may due to his stress and anger. He was emotionally disturbed and anxious to get normal adult voice. so isshiki type 3 relaxation thyroplasty was planned under local anaesthesia.

Procedure:

Procedure was done under local anaesthesia. Previously patient was put on nil per oral for 6 hours. Just have a look at the atlas of our procedure and then we will see the procedure in detail in discussion part.



Figure 1.1 A horizontal incision was made at the lower border of the thyroid cartilage and layers separated. ^{1,2}



Figure 1.2 Strap muscles identified and retracted.

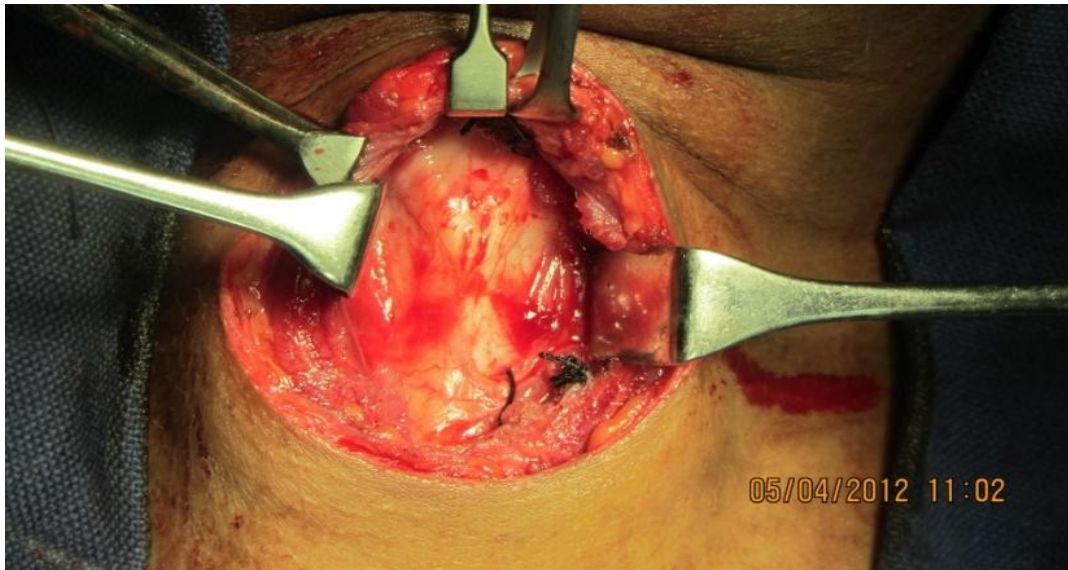


Figure 1.3 Thyroid cartilage was exposed and skeletonised.

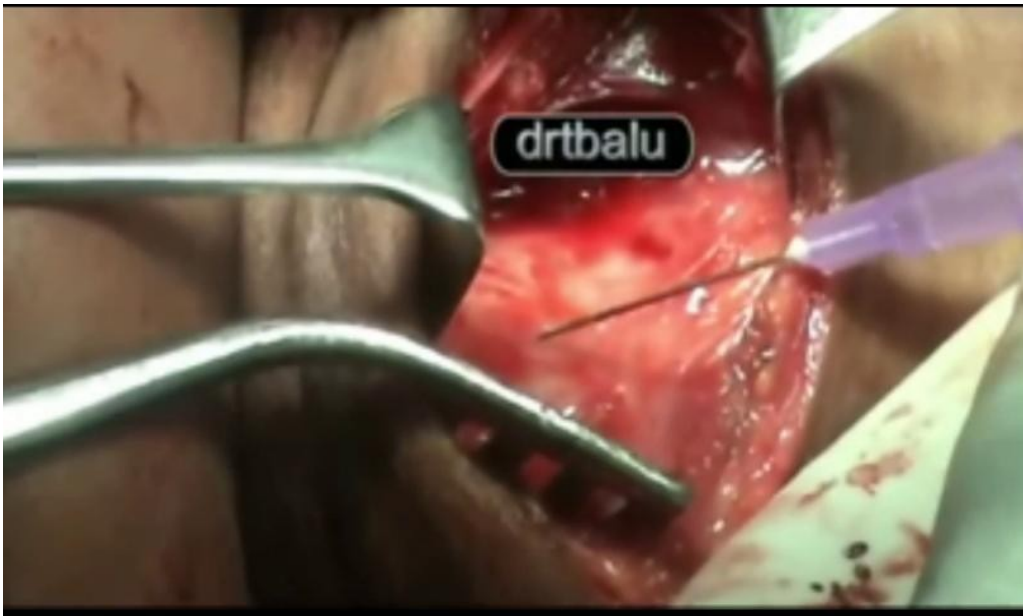


Figure 1.4 Perichondrium of the thyroid cartilage infiltrated with xylocaine.



Figure 1.5 Perichondrium of the thyroid cartilage incised in the midline vertically.

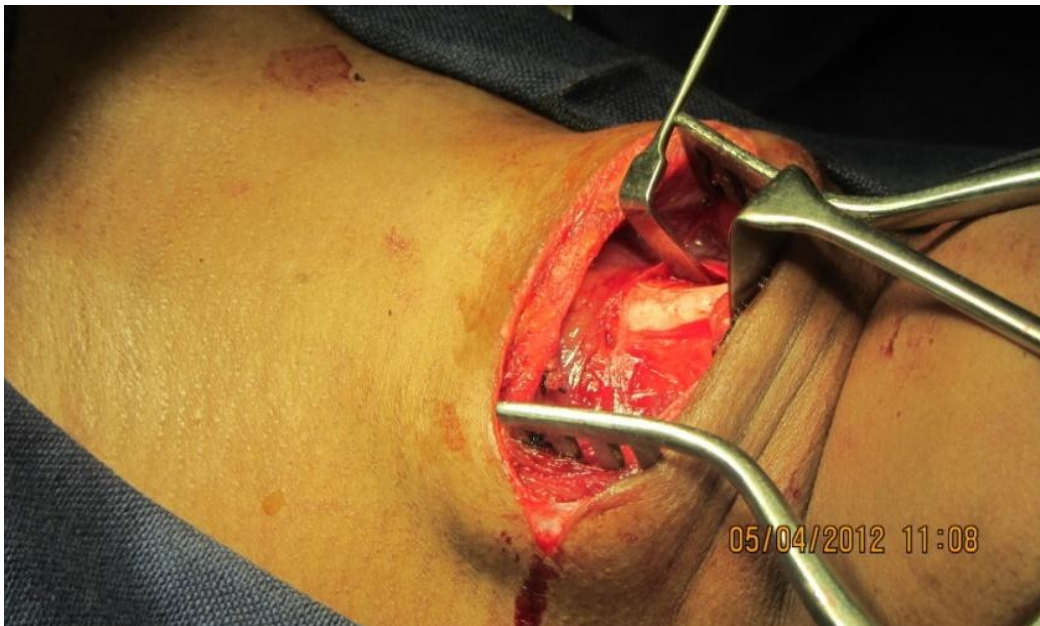


Figure 1.6 Perichondrium elevated from the thyroid cartilage.

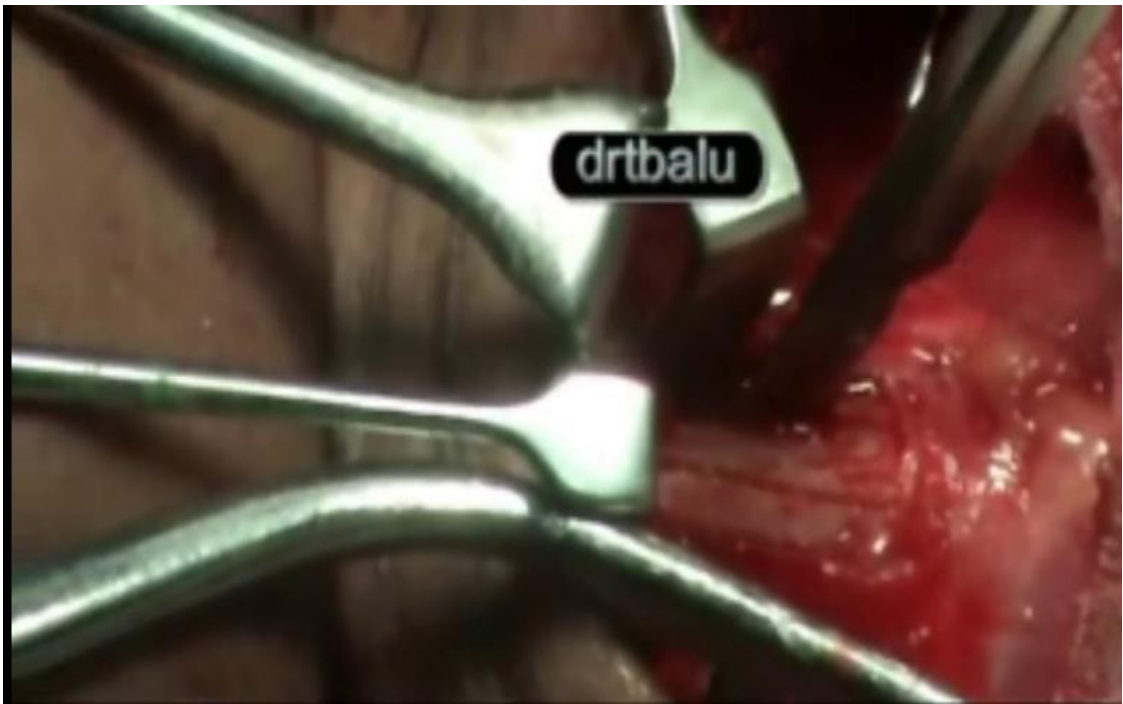
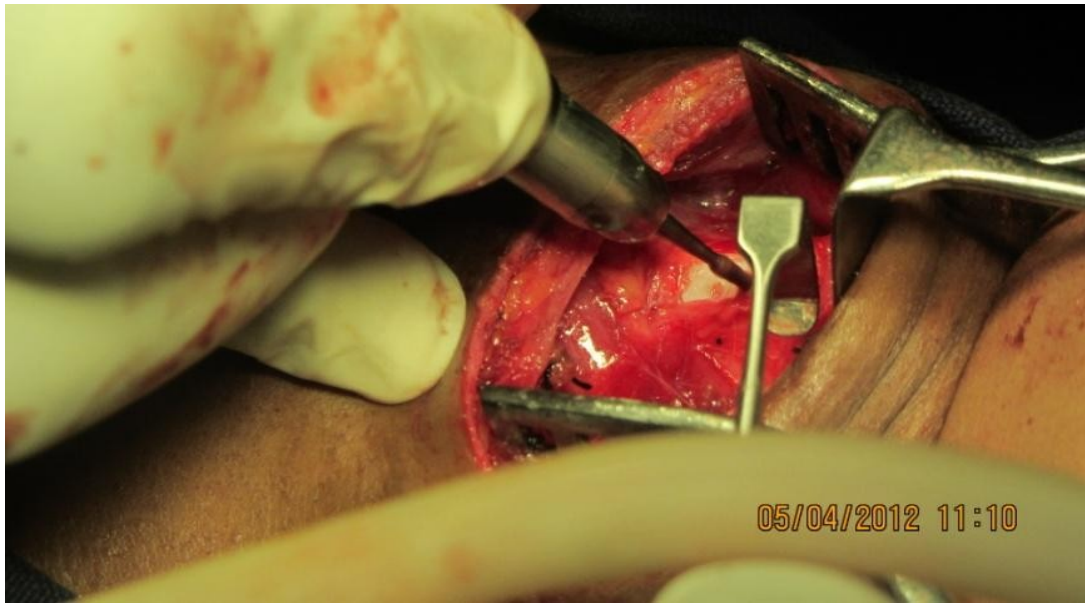


Figure 1.7 &1.8. 2 – 3 mm strips of cartilage incised either side of the midline of the thyroid cartilage with fissur burr and knife.

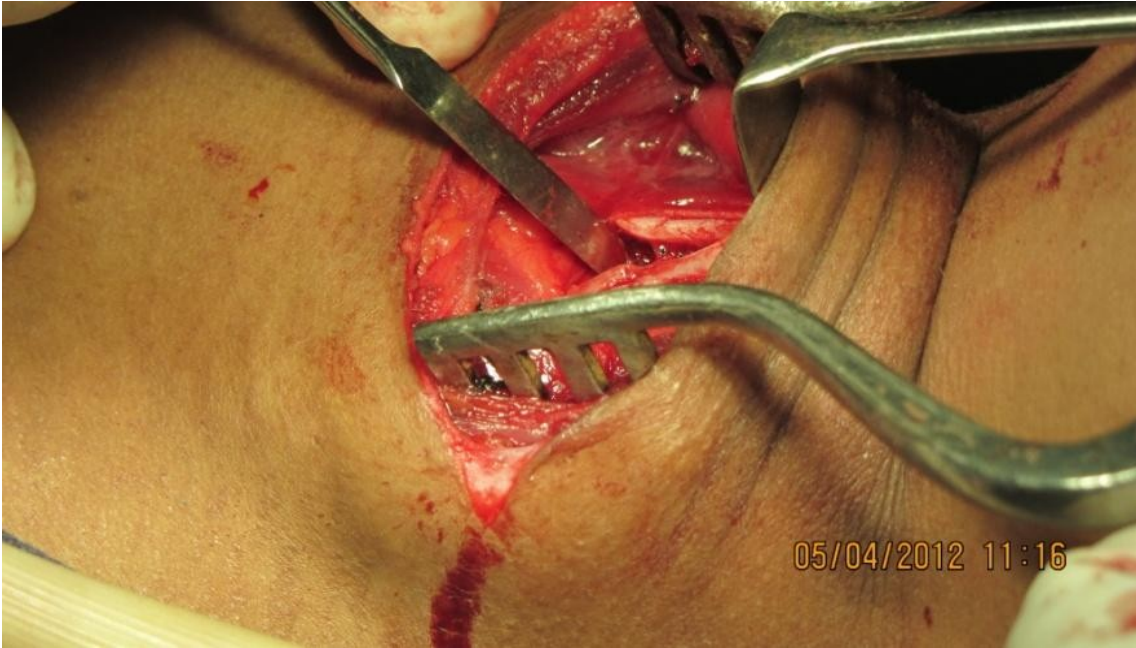
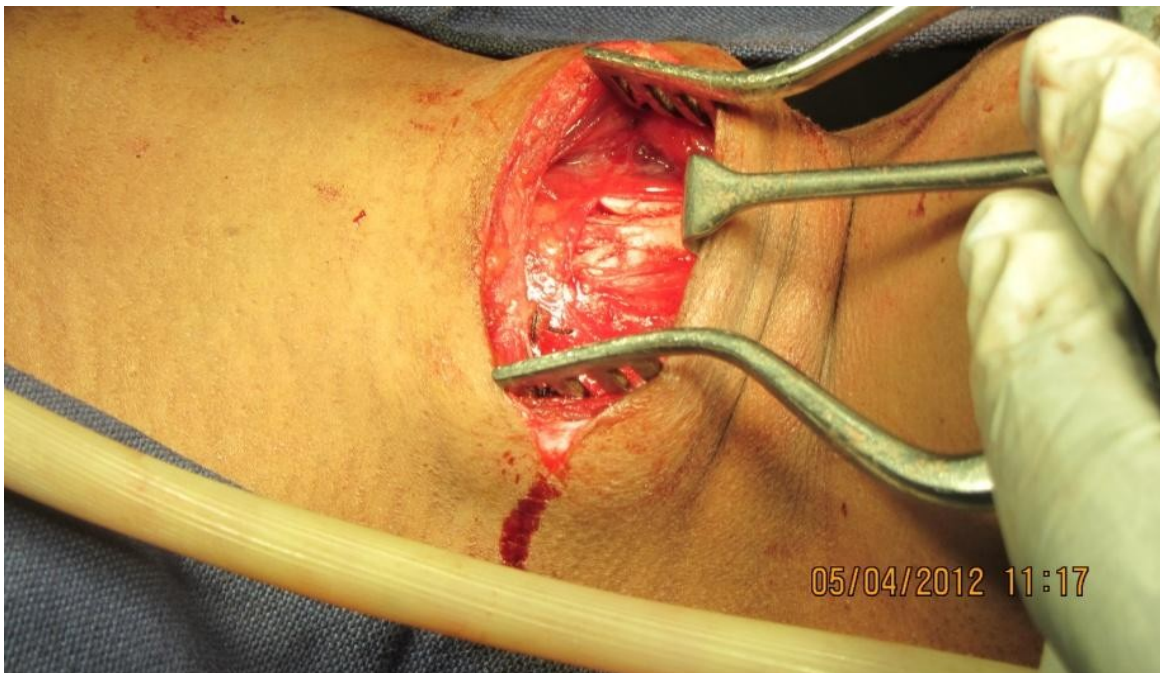


Figure 1.9 Middle portion of the thyroid cartilage freed on either side of the midline. ^{1,2}



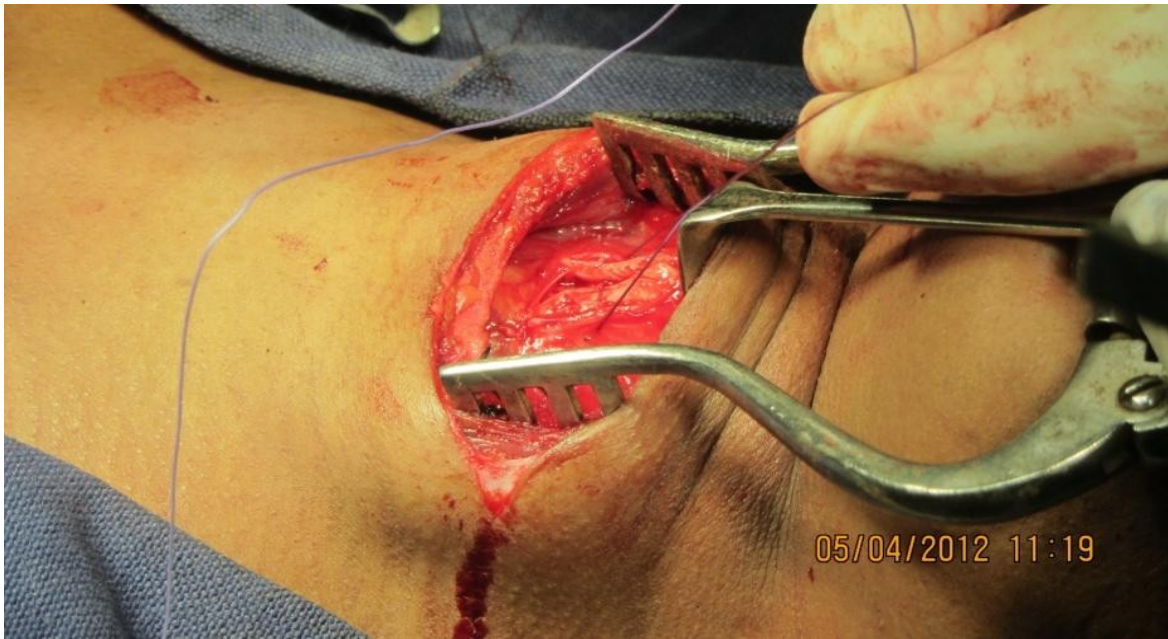


Figure 1.10 – 1.12 Free border of the thyroid cartilage were reapproximated. ^{1,2}



Figure 1.13 & 1.14 Wound closed in layers.

Discussion:

Puberphonia also known as mutational falsetto or voice break² Speech therapy is must before interfering with any surgical procedure. Psychological counselling should be considered depending upon his mental status.⁵ Isshiki type III relaxation thyroplasty has shown promise in managing these patients. Schematic diagrams are shown below for better understanding of the procedure.

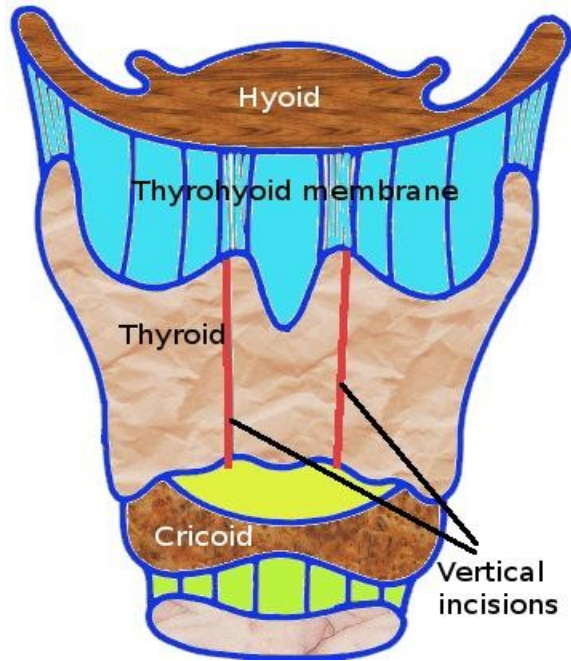


Figure 2.1¹

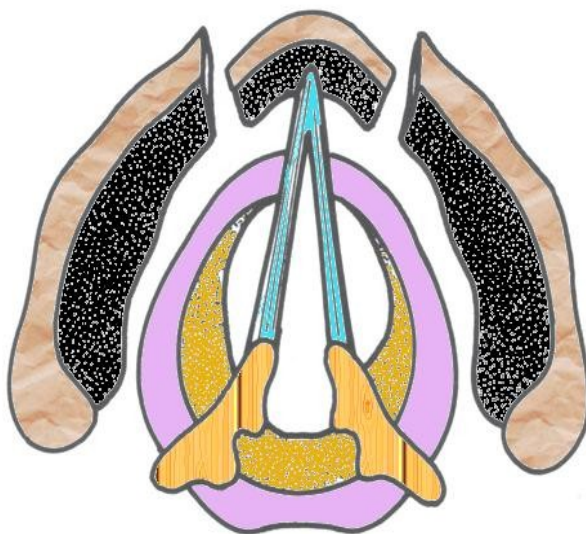


Figure 2.2²



Figure 2.3¹

In fig 2.1 a vertical incision was made either side of the midline of the thyroid cartilage. In fig 2.2 middle portion of the cartilage pushed posteriorly. In fig 2.3 free edges of the thyroid cartilage reapproximated with 2-0 vicryl. This procedure causes retrusion of the middle portion of the thyroid cartilage and leads to reduction in the length of vocal folds results in normal adult voice. Various modifications of ishiki type III relaxation thyroplasty have been proposed. These include:

1. Tucker's procedure:^{1,7}

This is a less invasive procedure in which superiorly based cartilage window is created at the level of anterior commissure and it is pushed back causing relaxation of vocal folds.

2. Alternatively a small window is created at the level of anterior commissure tendon and the cartilage window is created and pushed behind.²

3. Pau and Moorthy technique:² They mobilised the hyoid bone by dissecting suprahyoid musculature and it is sutured with cricoid cartilage. Thus cricothyroid distance is reduced and causes relaxation of vocal folds and normal adult voice.

4. Laryngeal manipulation :^{1,3,4} This is a quite recent method in the treatment of puberphonia. This was first reported by sudhakar vaidya in laryngoscope journal in 1995. Patient is asked to come on nil per oral for 6 hours. Patient is examined under xylocaine topical spray. Anaesthetist Macintosh laryngoscope is used for this procedure. Long blade of the laryngoscope is put in the vallecula and the patient is asked to say long eeee. Pressure over the vallecula stretches the vocal folds. Additional pressure can be given by laryngeal biopsy forceps over the anterior commissure. This procedure is repeated 3-4 times in a single sitting.

The impact of voice disorder varies greatly from person to person. Occupation, environment, family members and overall personality are all the variables that can affect the way voice disorder affects a specific person. In general, people with puberphonia tend to encounter problems that include psychological, emotional, social and professional related difficulty.⁵ Treatment of this condition not only improves voice quality of the patient but also quality of life of the patient.⁵

Conclusion:

Eventhough speech therapy is the most accepted management modality in managing these patients, in extereme cases if the situation warrants a surgeon should extend his longest arm to rescue the patient from the psychological precipe without hiding behind text books.

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