



# New and Emerging Techniques - Surgical

**Procedure Brief**

## **Thyroplasty Type II**

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New and Emerging Techniques – Surgical  
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**Royal Australasian  
College of Surgeons**

<b>NET-S Procedure Brief Summary</b>
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**Thyroplasty Type II**

- Thyroplasty Type II is a simple surgical procedure, performed using local anaesthesia, to lateralise or bow the vocal folds in order to treat adductor spasmodic dysphonia.
- The thyroid cartilage is cut at the midline and pulled apart by approximately 4 mm. The anterior commissure is pierced with a needle if glottal separation is not sufficient. Two silicon wedges are used to maintain separation of the thyroid cartilage.
- Thyroplasty Type II may be suitable for patients with adductor spasmodic dysphonia.
- Thyroplasty Type II appears to be efficacious, and has predictable and reversible results, with recurrence of spasmodic dysphonia unlikely.
- Thyroplasty Type II is not widely available in Australia, but is within the armamentarium of any competent phonosurgeon.

***NET-S Classification***

Thyroplasty Type II is emerging into Australasian health care.

## Background

Vocal cords (folds) play an essential role in speech, swallowing and breathing. To function normally, the muscles of the larynx must be able to abduct (open) and adduct (close) these folds.

There are two major types of vocal fold motion impairment, namely unilateral (relating to one fold) and bilateral (relating to both folds). In a patient with bilateral vocal cord motion paralysis (BVCP) also known as adductor spasmodic dysphonia (SD), the muscles of the larynx are unable to relax properly. Occasionally, sudden involuntary muscle movements (spasms) cause the vocal folds to stiffen and tightly close. Speech is disrupted, and is commonly described as sounding strained or strangled.<sup>1</sup>

Girls and women make up the majority of patients with SD. Stress or viral infection may trigger the onset of symptoms of SD but no significant environmental or hereditary patterns have been found to cause SD.<sup>2</sup>

Laryngeal framework surgery aims to improve the voice by restructuring the laryngeal framework. It does not involve surgery on the vocal folds, thus avoiding the possibility of scarring and voice aggravation. There are four types of laryngeal framework surgery for the surgical improvement and/or change of voice. They are classified as Type I for medialisation, Type II for lateralisation, Type III for relaxation of the vocal fold to lower the vocal pitch and Type IV for tensing or stretching of the vocal fold to raise the pitch. A more effective means of vocal fold medialisation, arytenoid adduction, was developed later.<sup>3</sup>

Lateralisation thyroplasty (Thyroplasty Type II) is a procedure to separate the vocal cords in order to treat SD.

## Techniques for Lateralisation Thyroplasty

There are two different techniques<sup>4</sup> to lateralise the vocal folds:

### **Method A**

Under local anaesthesia, the thyroid cartilage is cut at the midline and pulled apart by approximately 4 mm leaving the underlying vocal folds and their soft tissue attachment intact. The vocal folds show slight bowing (lateralisation) effect as indicated by the arrows (Figure 1, right). The patient is then asked to speak, to see whether any voice change occurs. Two silicone wedges are then used to maintain the separation (Figure 1, left).

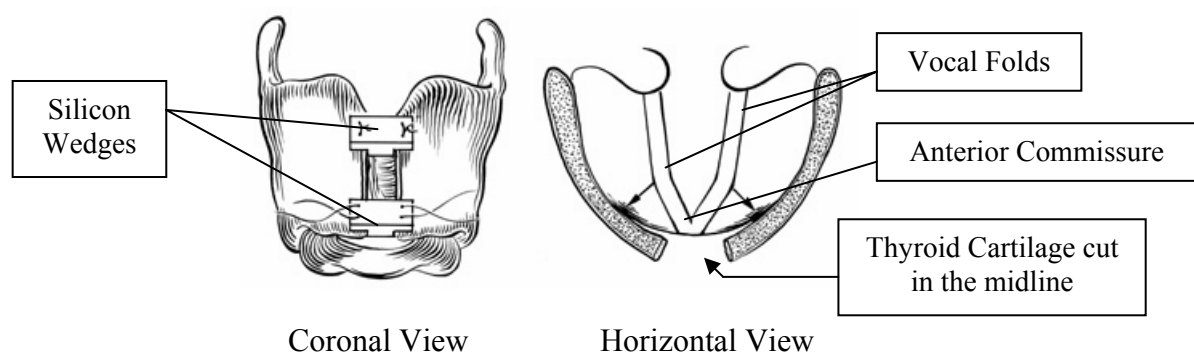


Figure 1. Thyroplasty Type II<sup>4</sup>

***Method B***

The only difference from the method above is that a perforation is made with a needle at the anterior commissure, to ensure sufficient glottal separation. Using a tiny composite graft taken from the upper ridge of the thyroid cartilage, the perforation is closed and an adjacent muscle flap is used to cover the graft, to seal it off from the airway.

**Patient Group**

Lateralisation thyroplasty (Thyroplasty Type II) may be appropriate for patients with adductor-type spasmodic dysphonia.

***Preliminary Evaluation***

Some patients may only have a slight degree of speech impairment and this makes the decision to carry out surgery difficult. It is recommended more conservative treatments such as voice relaxation techniques and deep respiration are performed and then outcomes observed for a period of six months before electing to perform surgery.<sup>4</sup> A course of Botulinum toxin (Botox) therapy should also be attempted before Thyroplasty Type II.

***Indications for Surgery***

Indications include excessive closure of the vocal folds on speaking, supported by laryngeal findings with a flexible endoscope or videofibroscope, relief from symptoms with Botox, with no response to conservative treatments such as voice relaxation and speech therapy. Neural diseases should also be ruled out. Patients with an associated tremor may not be good candidates for Thyroplasty Type II, as the procedure virtually replaces the spasm of the vocal folds with a tremor.

**Current Treatment and Alternatives**

Voice relaxation techniques and speech therapy can help reduce the symptoms of SD, especially in mild cases. They are designed to improve voice quality, increase loudness and reduce the patient's vocal effort. Some patients may also benefit from psychological counselling which helps them to accept and live with their voice problem.<sup>1</sup>

Local injections of Botox<sup>5,6</sup> produces bilateral weakness of the thyroarytenoid muscle, the Botox simply induces a temporary paralysis of the vocal fold and consequently a less tight closure of the glottis.<sup>4</sup> This treatment, although safe and effective, is only temporary and patients must return for repeat injections usually at intervals of four to six months.<sup>7</sup>

Cummings *et al.*<sup>8</sup> have developed a minimally invasive device with the potential for lateralisation or medialisation of the vocal process. The device consists of a polyethylene collar, a Vitallium cam and a double-helix core for engaging soft tissue and it is introduced through a circular opening in the thyroid cartilage by a modified thyroplasty approach. Effectiveness in humans is currently being assessed.

## Current Research Evidence

### **Safety**

The procedure is carried out under local anaesthesia, so there is minimal or no discomfort and there are no risks as would be associated with general anaesthesia. The procedure is potentially reversible if it was found to be ineffective during the procedure and readjustment is possible, during or after the procedure, as needed. The structural integrity of the vocal fold is preserved and no damage is induced on the physiological function of speaking, such as paralysis. No recurrence of SD is likely to occur.<sup>4</sup>

Complications include penetration of the mucosa of the larynx, wound infection, chondritis (inflammation of cartilage) and implant migration or extrusion. There is also a risk of airway obstruction and it is necessary for the patient to be observed for around 24 hours.<sup>9</sup>

### **Efficacy**

Isshiki *et al.*<sup>4</sup> reviewed the medical records of six patients with SD together with the fiberoptic video recording of laryngeal findings before, during and after surgery. The intraoperative video recordings of the surgical procedures were compared with the postoperative findings. Results showed that the vocal features of SD disappeared postoperatively and a normal, or almost normal, voice was attained in five out of six cases. Because patients had greatly varied symptoms and laryngeal findings, the surgery was individually tailored to each patient. The failure in one patient was attributed to failure of vocal folds to bow and lateralise. No recurrence had been noted over postoperative follow-up periods ranging from six months to three years.

So far, a total of ten patients with SD have had Thyroplasty Type II.<sup>10</sup> Recently, three patients complained of an occasional slight strain felt on voice production, but their voices were still much better than preoperatively.<sup>11</sup>

## Availability

Thyroplasty Type II is not widely available in Australia, but is within the armamentarium of any competent phonosurgeon. However, the procedure should be carried out in conjunction with a specialist doing Botox injections or in association with a Voice Clinic where Botox injection is practised.

## Summary

Thyroplasty Type II appears to be an effective treatment for spasmodic dysphonia in patients for whom conventional treatments have not been successful. It is simple to perform and reversible as the procedure does not affect the integrity of the vocal folds. A normal or almost normal voice can be achieved and there is little risk of recurrence of spasmodic dysphonia. Some complications can occur, but Thyroplasty Type II is performed under local anaesthetic, minimising the risk that would be associated with a general anaesthetic.

Thyroplasty Type II is a technique that is emerging into Australasian health care.

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