Unilateral Adductor Vocal Cord Palsy Treated with the Titanium Vocal Fold Medializing Implant (TVFMI)

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SUMMARY

Vocal cord palsy secondary to recurrent laryngeal nerve injury may be attributable to trauma, infiltrating neoplasm, congenital cardiac anomaly and others. Regardless the causes, majority of unilateral adductor palsy cases are usually managed by speech rehabilitation in order to allow compensation. In selected cases, medialization procedure may be required to achieve a complete glottal closure during phonation. Multiple techniques have been developed to achieve this goal. This case report illustrates the recent advancement in vocal fold medialization procedure, which has not been widely practiced in Malaysia.

KEY WORDS:
Vocal cord palsy, Medialization, Titanium

CASE SUMMARY

Eighteen years old Malay gentleman presented with hoarseness since November 2006. It was sudden in onset and persistent in nature. Past medical history revealed a history of congenital cardiac anomalies, which comprises of tricuspid atresia, small ventricular septal defect and pulmonary artery stenosis.

He was operated four times in National Heart Institute for his cardiac problem. The last operation was in 2004 and he was under follow-up till July 2005. There was no complaint of voice changes throughout the course of treatment.

Since then, he was able to do daily activities without restriction. In fact, he was actively involved in sports. He noticed that a change in voice about two years after the last operation.

Indirect laryngoscopy showed that he had left vocal cord palsy. The left vocal cord was in abducted position. During phonation, the glottic gap was present. There was no compensation from the opposite cord.

He was referred to speech pathologist for voice therapy. The progress was observed and rehabilitation continued for six months. However, after the trial of therapy, there was no improvement. In addition, he could not comply with the intensive therapy due to his academic commitments.

He was offered and agreed to left vocal cord medialization thyroplasty.

The operation was performed under local anaesthesia. A 4cm horizontal skin incision was made at the level of mid thyroid cartilage and soft tissues dissected away until thyroid lamina of the affected side was exposed. A marking stamp was used to localize the area of cartilage to be resected. Cartilage window was made at the level slightly below than the imaginary line of the vocal cord.

The 13 mm titanium implant was inserted and the posterior end was fixed with sutures. Voice assessment was made intraoperatively before closing the skin as in the usual manner.

The surgery was uneventful and the patient showed improvement in phonation during the subsequent follow-up.

DISCUSSION

Vocal cord palsy secondary to recurrent laryngeal nerve injury is one of the known complications following surgery to the neck or thorax. The left side is more prone to injury because of the longer course of the nerve, which travels down and hooked around the arch of aorta.

Besides direct injury during operation, recurrent laryngeal palsy can be due to any cardiovascular anatomical problems. It is known as Ortner's syndrome. Among the diseases, the dilated left atrium due to mitral stenosis is the most common reported cause of the syndrome. In this patient, the syndrome can be considered. This is because the hoarseness occurred few years after surgery. However, there was no cardiac anatomical assessment done to confirm the cardiac findings.

The final position of the paralysed cord will be determined by multiple factors. They include the contour, length and the mass effect of the cord, reinnervation and synkinesis if present and others. If compensation by the other side of vocal cord takes place, the patient will regain his normal voice. This is because a complete glottal closure is needed for a good laryngeal function. Voice production, swallowing, and breathing impairment are attributable to an insufficient glottal closure[1].

In order to achieve a complete glottal closure, several methods have been introduced in cases where the physiological compensation is not present. Significant improvement of vocal function can be obtained by external

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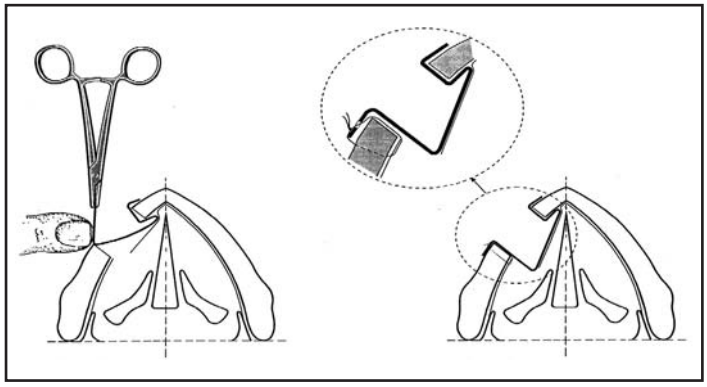

Fig. 1: Medialization thyroplasty with the titanium implant (picture courtesy of Prof Friedrich).

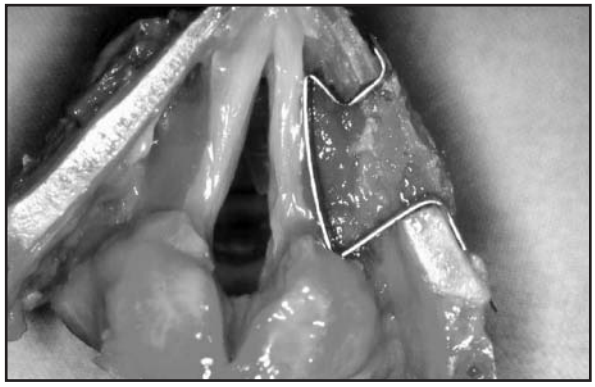

Fig. 2: Position of the titanium implant in a cadaveric vocal cord specimen (picture courtesy of Prof Friedrich).

vocal fold medialization in patients with glottic insufficiencies[2]. Isshiki's thyroplasty type 1 or medialisation thyroplasty according to the European Laryngeal Society (ELS) proposal[3], is one of the techniques of choice. Medialisation thyroplasty reduces the glottal gap and increases closed phase over one cycle and amplitude of vocal fold vibration, although a posterior glottal gap remains[4]. The implant used is the silicon-based material whereby the surgeon has to shape the block according to desired size after measuring the defect intraoperatively. The method is very much individualized and specifically tailored to every patient.

Medialization thyroplasty using titanium implant was developed by Friedrich from Medical University Graz[5]. Technically, it is almost similar to silicon-based Isshiki type 1 thyroplasty (Fig 1 and Fig 2). However, the experience in now over 200 patients with the titanium vocal fold medializing implant revealed that vocal fold medialization could be performed easily and that no perioperative complications occurred in any case. Because the implant is pre-formed as compared to the silicon, in which the surgeon has to model the block to accommodate the defect, the major advantage was a significant reduction of operative time. The time taken previously to model the silicon block can be saved. Besides that, the titanium implant is fully biocompatible, easily bent and shaped, specially designs to ensure optimal fixation and stabilization and offers a simpler technique. Only two sizes of implants are necessary, each one for male and female. No additional instruments are necessary apart from a bending forceps and a marking stamp.

This case highlights one of the treatment options in achieving a good glottal closure for a unilateral vocal cord adductor palsy patient. However, due to the cost and availability factor, the implant is still not widely used for Malaysian patients.

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