Alignment and Thickness of the Vocal Fold after Immediate Reconstruction of the Recurrent Laryngeal Nerve

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ABSTRACT

Purpose: Immediate reconstruction of the recurrent laryngeal nerve (RLN) following resection of the nerve together with invading cancer provides an excellent postoperative vocal function. This paper aims at determining perioperative changes in alignment and thickness of the vocal fold (VF) after immediate reconstruction of the RLN.

Subjects and Methods: Four patients who had RLN reconstruction immediately after resection of malignancies underwent three-dimensional computed tomography (3DCT) pre- and postoperatively. Views from the oral and tracheal sides and coronal images were built and utilized for evaluation by two of the authors about the position of the affected VF and the differences in thickness and vertical position between the VFs during phonation.

RESULTS

Preoperative voices were not so breathy as those of commonly seen RLNP patients because the affected VFs were not flaccid despite the absence of VF movement. Although their voices deteriorated after surgery, normal vocal function was obtained over time. (Table 2) Figures 2-5 show 3D endoscopic images of the 4 subjects during phonation and inhalation. Postoperatively, the posterior glottis approximated at the midline and the thickness of the affected VF increased being symmetrical with the healthy side during phonation in all subjects. In subject 2, the affected VF showed a median location 18 months postop, but not 7 months postop. (Fig. 3)

DISCUSSION

Normal voices can be achieved by providing the paralyzed VF with median location and thickness and tension symmetrical with the healthy VF. Glottal configuration during phonation in patients with UVFP varies among patients. Although the affected VF was thinner than its mate before surgery, the same VF thickness was obtained after nerve reconstruction in all patients. Moreover, all patients showed the affected VF to be situated at the median position, resulting in symmetrical configuration of the laryngeal lumen during phonation. Subglottic shape of the affected VF during phonation suggested the presence of activity of the adductor muscles. On the other hand, the affected VF in patients 1, 3 and 4 was in the adducted position even during inhalation (Figures 2, 4, and 5), suggesting the presence of synkinesic reinnervation.

CONCLUSIONS

Immediate reconstruction of the RLN after resection of malignancies results in median location and thickening of the affected VF during phonation and, therefore, provides excellent vocal function. However, movement of the affected VF is not achieved and synkinesic reinnervation occurs in some cases.

REFERENCES