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Assessment of vocal morbidity following cervical endocrine surgery

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Laryngeal functions (swallowing, breathing and phonating) may be damaged by partial or total exeresis of thyroid and parathyroid glands and by (neck) lymphadenectomies. The impact of these high-risk surgical procedures on phonatory function is the purpose of the present study. Voice troubles may have various origins: laryngeal injury as a result of endotracheal intubation, injury or denervation of laryngeal external muscle structure, injury to the superior or inferior (reccurent) laryngeal nerves (Meek et al., 2008; Van Lierde et al., 2010). In the case of preservation of the nervous system functions, the postoperative voice disorders are characterized by a decrease of speaking fundamental frequency, an amplitude decrease of prosodical variations, an increase of voice instabilities (jitter, shimmer, breathy voice) and a modified Voice Vange Profile in frequency and intensity (Debruyne et al., 1997, Van Lierde et al., 2010). All these studies agree on a recovery of preoperative speech abilities at least three months following surgery, when the laryngeal nerves were unaffected. Yet, voice assessment is always based on a sustained vowel. Does the patient fully recover his abilities to speak and sing?

A prospective multimodal epidemiological study was conducted on a group of 74 patients. The speaking and singing abilities were assessed preoperatively and postoperatively (6 to 8 weeks). The surgical procedure was detailed, and the intraoperative neuromonitoring of laryngeal nerves was recorded. Voice assessment was a three-step process: (1) a precise laryngological examination, (2) acoustical and aerodynamical measurements during voicing, speaking and singing tasks, (3) a perceptual self-evaluation (VHI10 questionnaire) of the patient's voice feeling. During step (2), acoustical parameters such as fundamental frequency and vocal intensity were measured. Aerodynamical subglottal pressure was estimated from intra-oral pressure. The Maximum Phonation Time (MPT) was measured on sustained consonants and on a vowel.

As a first result, the vocal morbidity of such surgery cannot be neglected. A great number of patients demonstrated vocal problems. These problems can be substantial: unilateral vocal-fold paralysis was observed for 6 patients during the laryngeal-endoscopical examination, laryngeal and vocal abnormalities unrelated to motricity (e.g. cysts or polyps) were found in 13 patients, and other types of abnormalities of the laryngeal movement or associated to adduction-abduction movement were detected on 23 patients. Yet, a majority of patients (39) did not demonstrate any abnormality. Concerning the breathing management, the patients' MPT were postoperatively shorter on the sustained vowel. Estimated subglottal pressure was

postoperatively greater in speech, but not in singing where pitch was controlled. The pitch range on Voice Range Profile was postoperatively reduced, as high-pitched tones were more difficult to produce for many patients.

Bibliographical references

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