Endoscopic resection of supraglottic (T1-T2-T3) and glottic (T2-T3) carcinomas using microdissection electrodes

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Endoscopic electrosurgical resection of vocal cord carcinomas of stage T1 using microelectrodes (MEs) is a reliable surgical procedure; we have applied that experience to more advanced tumor stages in the glottis and the supraglottis. The present study describes the new electrode shape and the surgical technique.

Materials and Methods

The surgical procedure was performed on 15 patients with laryngeal carcinoma who accepted operation after being provided thorough information. See carcinoma stages in Table 1.

The study design was approved by the Institutional Review Board for Clinical Research of our institution.

Surgery began with a conventional direct suspension laryngoscopy, with the same set of laryngoscopes used for carbon dioxide (CO₂) laser surgery and hand instruments used for conventional laryngeal microsurgery. Tissue resection was performed with ultrafine tungsten MEs of a newer design (Suter Instruments, Friburg, Germany). These MEs consist of 21-cm-long, angled, ultrasharp, tungsten needle electrodes (Fig 1). As shown, the MEs are angled at 90° (right-left), 135°, and 180° at their very distal ends. The proximal portion of the shaft is bent and inserted into a conventional electric scalpel (ES) hand piece (SW1200; Shining World Health Care Co., Taipai, Taiwan). This type of ES has a screwing pen point in the hand piece, which permits tightening of the ME into the hand piece; achieving a tight fit between the ME and the ES hand piece is essential for correct operation. The angled ME permits direct viewing of the surgical field.

A polyvinylchloride anesthetic tube was used for the anesthetic procedure (Malinckrodt, Athlone, Ireland).

Tissue resection was performed in either the cutting or the coagulating mode, depending on the extent of bleeding. The electrosurgical generator was set to an output power of 5-20 W (depending on soft tissue or cartilage resection).

Corpectomy types III, IV, and V² were performed according to the general principles described elsewhere. The 90°-angled ME is helpful in the performance of up-down section of the vocal cord in the anterior commissure and in its insertion into the arytenoids.

For an epiglottectomy, the laryngoscope was held against the tongue base. Traction was applied with a microforceps during simple sectioning of the epiglottis at the level of the vallcula. More extended supraglottic resections were performed according to the general principles described elsewhere. The use of 180°-angled or 135°-angled ME facilitates resection.

Bleeding was treated by clamping the vessels with microforceps and electrocoagulation. Tissue samples from the surgical margins were submitted for intraoperative study. Neck dissections, when indicated, were performed in the same operation.

Temporary tracheostomy was always carried out when a bilateral neck dissection was performed and in two patients with severe chronic obstructive pulmonary disease. See parameters in Table 1.

Results

Tumor location, TNM stage, and other parameters regarding each patient are shown in Table 1.

Discussion

After performing oncological laryngeal surgery with a CO₂ laser for 19 years, the authors recognize several advantages of the ME technique: It requires considerably shorter surgical time, especially when cartilage sectioning is necessary; no data comparing CO₂ laser time versus ME can be offered because they are nonexistent to this date. The MEs allow the surgeon to feel by touch the thyroid cartilage or the hyoid bone; the so-called “touch of the laser” is only a