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Inferior glottoscopy

A new approach to the problem of phonation

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THEORIES on the production of voice are still controversial, none of them being substantiated by sufficient evidence. In order to acquire new evidence which might support one or other of these theories, we have inspected the glottal region from below, in those patients with normal vocal cords who have had to undergo operations which require tracheostomy.

For this reason, we chose patients who were to be operated on for horizontal supraglottic laryngectomies or 'Commando' operations. In these operations, tracheostomy is performed first, under local anaesthesia, and the patient can phonate when requested. Ten per cent xylocaine was sprayed into the trachea and a lateral telescope, connected to a cold light fountain with a fibre optic cable (Fig. 1), was introduced. In order to connect the endoscopic telescope to a film-or-TV-camera we used an articulated optical arm with a lens system (Fig. 2). In this way we were able to record our cases on videotapes and to take coloured 15 mm. films.

'Inferior glottoscopy' enabled us to observe the glottis from below, while the patient was breathing and phonating. During respiration the vocal folds became abducted, as expected. The patient was then requested to pronounce vowels, and to say the Italian word 'aiuole' (in which all five Italian vowels occur); he was also asked to say a few words, such as his name and address.

In all ten patients whom we examined in this way, we were able to observe that during phonation, whatever sound was uttered by the patient, only the anterior half of the glottis was moving during the emission of voice, while the posterior half remained tightly closed. The passage of air through the anterior half of the glottis forces it to open in the shape of an ellipse.

We were unable to observe any modifications in the length of the 'ellipse' of the mobile glottis with changes of vocal tone, because all the patients who were asked to raise the pitch of their voices emitted a louder sound.

During phonation the mucous membrane of the subglottic aspect of the vocal cords is pushed upwards by the pressure of the air flow against the underlying muscle and, owning to the particularly loose submucous tissue in this region, its shifts upward, so that a fold results bilaterally. The air

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FIG. 1

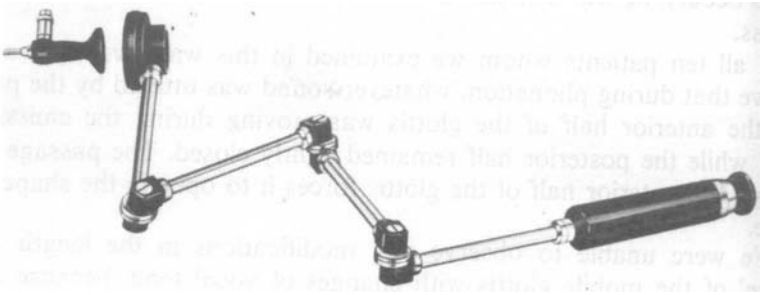


FIG. 2

flow passes through these two mucosal folds, which start to vibrate and thus produce sound.

In our opinion, this direct observation of the shifting upwards of the subglottic mucosa supports the muco-undulatory theory of Perelló (1962).

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