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ORIGINAL RESEARCH

Comparison of approaches for oral cavity cancer resection: Lip-split versus visor flap

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OBJECTIVE: To compare lip-split and visor flap approaches to the oral cavity in terms of morbidity, margins, and locoregional recurrence.

DESIGN AND SETTING: Retrospective case series at the University of Washington, Seattle.

METHODS: Seventy patients undergoing resection of advanced (T4) anterior oral cavity squamous cell carcinoma requiring fibula reconstruction were grouped according to surgical access procedure performed (lip-split [LS] or visor flap [VF]). Data on surgical morbidity, margin status, and outcomes were compared.

RESULTS: Recurrence rates and positive margins were similar for both groups. Rates of postoperative fistulae were 6.8% (LS) vs 0% (VF) and for oral incompetence 14.6% (LS) vs 6.9% (VF). Most of the fistulas (37.5%) were in irradiated patients. Neither group had any malunions.

CONCLUSIONS: There is no significant difference in pathological margins or rates of local recurrence when using either the lip-split or the visor approach. The lip-split approach has a higher rate of postoperative fistula formation than the visor flap approach; fistula formation may be associated with previous irradiation.

Historically, survival rates have been the only outcome used to measure the success or failure of cancer treatment, but this approach fails to measure the impact of the treatment on the survivor. The effects of tumor location, size, and stage on recurrence rates are what tend to drive research and treatment protocols. However, the recent introduction of quality-of-life (QoL) measures to head and neck cancer research has had a profound effect on how we measure treatment success and failure. Although survival is still the primary end point, data such as symptoms, psychological adjustment, degree of functional deficit, and postoperative appearance are recognized as giving a more complete picture of patient outcome.[1] The oral cavity performs multiple complex tasks, making it sometimes difficult to balance the need for adequate margins with the goal of preserving function and minimizing disfigurement. For advanced oral cavity cancers, form and function are generally sacrificed in exchange for better survival. This approach is reflected in the lower QoL generally seen in these patients.[2] Indeed, because the mouth is central to speech, swallowing, gustation, and cosmesis, it is closely linked to posttreatment QoL indicators.[2] No one would argue that cosmesis and function should take precedence over good oncological management. However, surgical approaches that preserve function, minimize complications, and maximize cosmetic outcome should be encouraged in appropriate patients when feasible.

The type of surgical access used depends on the size and location of the tumor as well as the surgeon's comfort and experience with the surgical procedure. For the last 30 years, the main access procedure for advanced oral cavity tumors has been the lip-split approach with or without a mandibulotomy. Proponents of the lip-split approach (Fig 1A) cite better access and three-dimensional assessment of soft tissue involvement than with other techniques in which the lip is not split.[3] These advantages are especially true in advanced anterior floor-of-mouth cancers involving the mandible. It is felt that the surgeon has much better control over the anterior margins in this circumstance, which in turn translates into wider tumor margins and better local control. Critics of this approach maintain that there is a higher rate of functional deficit, postoperative morbidity, and unsightly scarring, even in the best of hands. As an alternative, the authors assert that the visor approach (Fig 1B) has a better cosmetic and functional outcome while maintaining competitive rates of free margins and local recurrence. The purpose of this study was to compare the lip-split and visor approaches to the oral cavity. We assumed that the visor incision would provide a better aesthetic outcome, and directly compared the functional and oncological outcomes between the two approaches when used in advanced oral cavity cancer resections.

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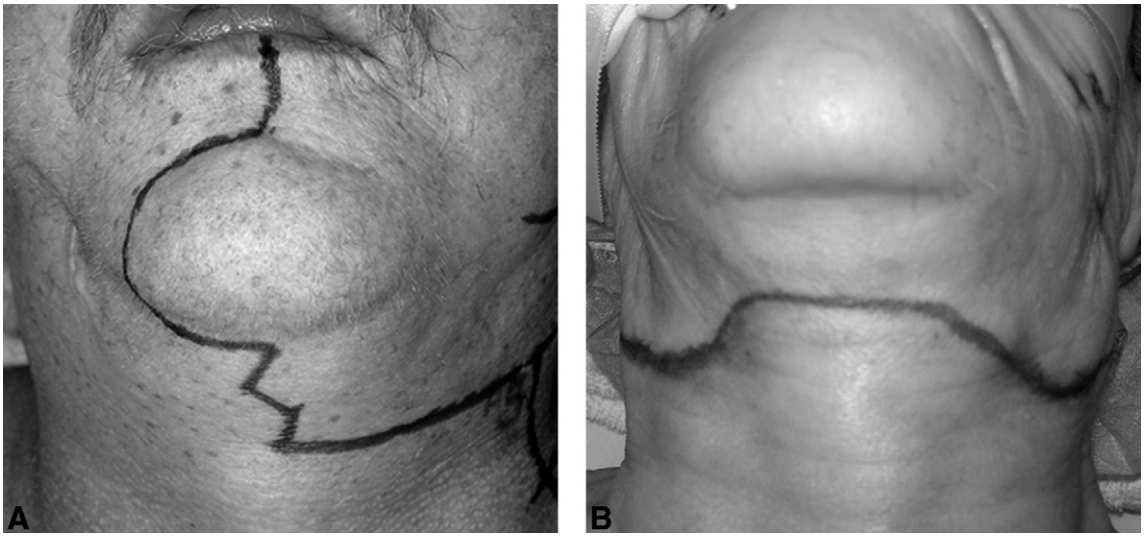

Figure 1 **(A)** Lip-split approach: There are many variations to the geometric pattern used to come through the lip. Meticulous closure and zigzag incisions yield optimal results, but the common denominator is facial scarring and an increased risk of oral incompetence. **(B)** Visor approach: The basic visor approach is from mastoid to mastoid and is far enough below the mandible to avoid injury to the marginal mandibular nerves. The benefit is that it avoids scarring on the face and avoids interruption of the lower lip with its associated morbidity.

SUBJECTS AND METHODS

Between December 1995 and December 2003, 219 patients with advanced primary squamous cell carcinoma of the oral cavity involving the anterior mandible and requiring segmental mandibular resection were identified at the University of Washington in Seattle. After obtaining approval from the institutional review board, we matched patients carefully for size of tumor (all T4 tumors involving mandible), tumor location (anterior oral cavity), history of previous irradiation, and type of reconstruction (all were reconstructed via fibular free-flap). Patients with skin involvement, extension beyond the retromolar trigone region, nonmalignant disease, or massive disease extending beyond the boundaries of the oral cavity were excluded. Patients with transoral excisions of their tumor were also excluded. The remaining 70 patients were categorized by surgical approach (lip split vs visor) and matched for stage, defect, and tumor type (all having a squamous cell carcinoma as primary). Data on complications included presence of fistulae, oral incompetence, and mandibular malunion. Margins were recorded as positive ($<$ 1 mm), close (within 2-6 mm), and widely free ($>$ 6 mm). Outcomes compared between these two groups were locoregional recurrence and, more specifically, local recurrence within the anterior field (focusing on sites thought to be susceptible to closer margins using the visor approach). Complications of fistula, nonunion, oral incompetence, and intraoral wound dehiscence were recorded and compared. Statistical analysis was performed with the use of SPSS, version 11.0 software (SPSS Inc, Chicago, IL). All categorical data were analyzed with the chi-square test.

Technique

Lip-split technique. The lip-split technique was described previously[4] and repopularized by Babin and Calcaterra[3] in the late 70s. The incision is usually a superior extension of the neck dissection incision (Fig 1A). The vermillion border is scored and the lip divided sagittally. Any one of a number of zigzag or geographical patterns is used as the incision approaches the supramental crease. This jagged incision can be brought down through the mentum or circumferentially around the mentum, preserving the anatomical subunit. The incision is carried down below the mandible and united with the neck dissection in the midline. Bilateral or unilateral cheek flaps are then raised, leaving the periosteum intact. At this point a mandibulotomy is used if general oral cavity access is required or, as in our study subjects, resection of the involved mandible and floor of mouth is begun. The key to a good reconstruction is meticulous reapproximation of the lip components in a layer-by-layer closure, which requires that the oral vestibule be reapproximated with a trifurcation stitch.

Visor flap approach. The visor flap has been described as a surgical approach in one form or another for decades. It is a versatile flap for oral cavity access and can extend from mastoid to mastoid or mastoid to mental foramen (Fig 1B) of the opposite side, depending on the extent and location of tumor.[5] The flap is raised in a subplatysmal plane to the level of the inferior border of the mandible. Care is taken not to injure the marginal mandibular branch of the facial nerve. At this point the chin and cheek skin flaps are raised, providing excellent visualization of the mandible while preserving periosteum. Gingivobuccal and gingivolabial sulcus incisions are placed just anterior to the mental foramen on