The Orbitocranial Approach for Treatment of Adenoid Cystic Carcinoma of the Lacrimal Gland

Matthew E. Spector, MD1 Kevin F. Wilson, MD2 P. Daniel Ward, MD2, Lawrence J. Marentette, MD1
Department of Otolaryngology – Head and Neck Surgery, University of Michigan1 and University of Utah2

INTRODUCTION

Adenoid cystic carcinoma (ACC) of the lacrimal gland is a rare epithelial orbital malignancy. However, it is the most common epithelial malignancy at this site.1 Controversy exists over the optimal management in the treatment of this tumor. Some authors advocate conservative eye-sparing surgical therapy followed by external-beam radiation therapy or proton-beam therapy.2 Others believe that radical exenteration with or without surrounding bone removal is most appropriate.3 Generally, patients with ACC of the lacrimal gland have a grave prognosis, making conclusive therapeutic recommendations difficult.4

METHODS AND MATERIALS

The records of all patients with ACC of the lacrimal gland treated in our multispecialty Anterior Skull Base Clinic at the University of Michigan were retrospectively reviewed. All patients were staged using clinical and radiographic findings according to the AJCC classification system and treated surgically with an orbitocranial approach by a combined surgical team consisting of members from the Otolaryngology–Head and Neck Surgery and Neurosurgery departments. All patients were treated postoperatively with radiation therapy.

The goal of the orbitocranial resection is to achieve en bloc removal of the orbital contents, the tumor, and the adjacent bone for adequate margins. A coronal incision is used to access the affected orbit with skeletonization of the zygoma and superior and lateral orbital rims. A frontotemporal craniotomy is performed that exposes the orbital roof and the lateral orbital wall. After careful dissection of dura away from the roof of the orbit, while minimizing brain retraction, osteotomies are created in the superior and lateral orbital rims, and these are removed if not involved with tumor (Figure 1). The bone is then mobilized laterally, which allows access along the medial orbital wall to the contents of the orbital apex. The optic nerve and contents of the superior orbital fissure are clamped, the exenteration is performed, and the specimen is removed en bloc, which includes the orbital contents, the lacrimal gland, and the superior and lateral orbital walls (Figure 2). The orbit and the lateral wall are then reconstructed with bone grafts taken from the inner table of the craniotomy bone flap. A fasciocutaneous free flap may be raised and inserted into the orbital cavity, and the cutaneous portion is sewn to the remaining lids if they are not resected with the specimen.

RESULTS

Seven patients were identified with histologically confirmed adenoid cystic carcinoma of the lacrimal gland treated by the Anterior Skull Base Multidisciplinary Team between 1995 and 2009. The mean age at diagnosis was 46 years (range, 30 to 78 years) and there were 2 men and 5 women. Four patients were staged T2, one T3 and one T4. One T stage is not apparent from the record. No patients had regional or distant metastases at presentation.

All patients underwent gross surgical excision of tumor followed by postoperative radiation. The mean and median follow-up times were 39 and 19 months, respectively, with a range of 7 to 138 months. No patient had local or regional recurrence. Two patients succumbed to metastatic disease. One patient presented with distant metastases to the lungs, spine, and dura 16 months after surgery and the other presented with metastases to the contralateral skull, bone, and liver 28 months after surgery (Table 1).

DISCUSSION

Because ACC of the lacrimal gland is rare and published studies are small, comparisons of different treatment types are difficult. Many clinicians perform globe-sparing procedures or orbital exenteration alone for these tumors and remove surrounding bone only when it appears clinically or radiographically involved.5 However, there is difficulty in obtaining soft tissue margins in this area. We advocate the removal of superior and lateral orbital bone in all patients with moderate- or advanced-stage lacrimal gland malignancies as a surgical margin.

Esmaeli et al.4 reported on the outcomes of 20 patients with adenoid cystic carcinoma of the lacrimal gland treated identically with an orbitocranial approach. Controversy exists over the optimal management of adenoid cystic carcinoma of the lacrimal gland, though patients remain at risk long-term for distant metastases. The complication rate on our patient series was acceptably low, and there were no major complications. Orbital bone removal for adequate margins should be a routine part of tumor resection for these malignancies. Our overall complication rate was low, suggesting that patients do well with this treatment.

HISTORICAL PERSPECTIVE

The orbitocranial approach achieves excellent local and regional control rates for adenoid cystic carcinoma of the lacrimal gland, though patients remain at risk for long-term for distant metastases. The complication rate on our patient series was acceptably low, and there were no major complications. Orbital bone removal for adequate margins should be a routine part of tumor resection for these malignancies. This minimizes local recurrence rates while providing an acceptable cosmetic result, especially after reconstruction with bone grafts and free tissue transfer.

REFERENCES