

Recurrent squamous cell carcinoma with intracranial invasion of the dura mater after Mohs surgery



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Key words: dural invasion; lesion drainage; nonhealing lesion; skull invasion; squamous cell carcinoma; tumor recurrence.

INTRODUCTION

We present a case of a nonhealing, moderately differentiated American Joint Committee on Cancer, 8th edition, T3NxMx or Brigham and Women's Hospital stage T2b cutaneous squamous cell carcinoma (cSCC) on the left frontal scalp, which was initially treated with Mohs surgery but presented with persistent wound drainage at the 8-week follow-up, representing recurrence with invasion through the skull. Our case emphasizes the importance of close follow-up after treatment of high-risk squamous cell carcinoma (SCC) and the consideration of further workup for persistent wounds after surgery.

CASE REPORT

A 76-year-old man with a history of diabetes and no prior skin cancer or immunosuppression presented with a 6-month history of a growing, bleeding, and ulcerating mass on the left frontal scalp. Biopsy from an outside Veterans Affairs hospital revealed a moderately differentiated SCC with no evidence of perineural invasion (PNI) or lymphovascular invasion. He denied experiencing any numbness or tingling on the affected lesion. On physical examination, there was a 3.5 cm × 3.0 cm pink, ulcerated plaque on the left frontal scalp (Fig 1). No clinical lymphadenopathy was present. Computed tomography (CT) with contrast of the head and neck demonstrated neither bony invasion nor lymph node involvement.

Abbreviations used:

cSCC: cutaneous squamous cell carcinoma
 CT: computed tomography
 PNI: perineural invasion
 SCC: squamous cell carcinoma



Fig 1. Patient's squamous cell carcinoma on the left frontal scalp before Mohs surgery.

The patient underwent Mohs surgery with the deepest microscopic level of tumor invasion at the galea, but not periosteum, which was also taken. However, microscopic residual periosteum tumor is still possible because this was a narrow margin.¹ The tumor was cleared after 3 stages, with a post-Mohs surgery defect size of 4.8 cm × 4.5 cm. A bilateral rotation flap repair was performed and the patient was prescribed postoperative antibiotics. The Mohs

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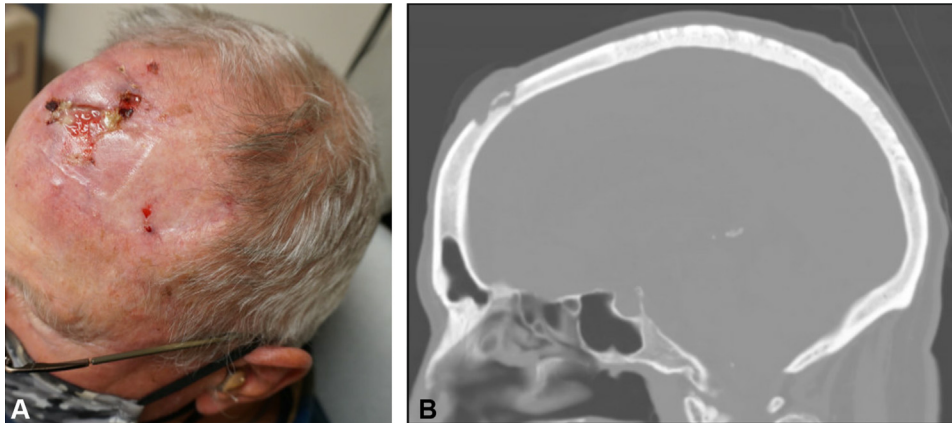


Fig 2. **A**, Persistent wound drainage at the previously treated Mohs site at the 8-week postoperative visit. **B**, Eight-week postoperative visit computed tomography of the head and neck with and without contrast.

specimen was submitted to pathology for permanent sections and revealed moderately differentiated SCC with no definite PNI or lymphovascular invasion. Consultation with the radiation oncology department was discussed and documented; however, the patient declined because of travel concerns.

Six weeks later, the patient reported 2 instances of purulent-appearing drainage from the site treated with Mohs surgery with mild soreness but no tenderness or pain (Fig 2, A). Wound cultures, which were ultimately negative, were obtained, and he was treated with antibiotics for presumed infection. At the 8-week postoperative visit, he developed a subcutaneous nodule within the prior flap with tenderness and persistent drainage. He underwent incision and drainage for presumed abscess; however, during the procedure, a bone fragment was recovered. Tissue was sampled, submitted for permanent section, and revealed granulation tissue and bone fragments with no signs of malignancy. Repeat CT of the head and neck with and without contrast the same day revealed a “new bony erosive/destructive change involving the frontal bone at midline, which extends through the full-thickness of the frontal bone,” suggestive of intracranial involvement (Fig 2, B). Follow-up brain magnetic resonance imaging revealed a “soft tissue scalp lesion... extending through the outer table and diploic space...Immediately subjacent to this dehiscence, there is a small 2 mm focus of relative hypoenhancement along the lateral aspect of the superior sagittal sinus, which is indeterminate though is suspicious for a tiny component of intracranial and potentially dural sinus tumor invasion,” and “asymmetrically prominent left-sided intraparotid lymph nodes.”

Neurosurgery and otolaryngology departments were consulted. The patient underwent ^{18}F -fluorodeoxyglucose positron emission tomography CT of the head and neck, which revealed “left frontal scalp SCC associated with left parotid lymph node ^{18}F -fluorodeoxyglucose activity.” Fine-needle aspiration of the left parotid revealed clusters of neoplastic cells, positive for p40, supporting metastatic SCC to the lymph node. Three additional skin biopsies were performed within the site treated with Mohs surgery, which confirmed recurrent moderately differentiated SCC. Therefore, the patient underwent craniectomy and mesh cranioplasty, radical scalp excision, left neck dissection, and left parotidectomy (Fig 3). The specimens obtained during these procedures revealed recurrent moderately differentiated SCC dural and lymphovascular invasion, 3 positive lymph nodes (2 of 3 had extracapsular extension), and no PNI. The margins were negative from 6 frozen sections obtained during the surgical procedure. The patient underwent oncology evaluation, staged at PT4aN3M0, and was treated with adjuvant chemoradiation. At the most recent postoperative visit with the otolaryngology department, the patient’s surgical site was healing well.

DISCUSSION

Although cSCC has a low recurrence rate after Mohs surgery, Brigham and Women’s Hospital stage T2b tumors with 2 to 3 high-risk features (large caliber PNI, depth past fat, a size of $>2\text{cm}$, and poor differentiation) have a 28% rate of recurrence and 24% rate of nodal metastasis.² The primary tumor in this case was Brigham and Women’s Hospital stage T2b based on a size of $>2\text{cm}$ and invasion beyond subcutaneous fat, which led to imaging of the tumor

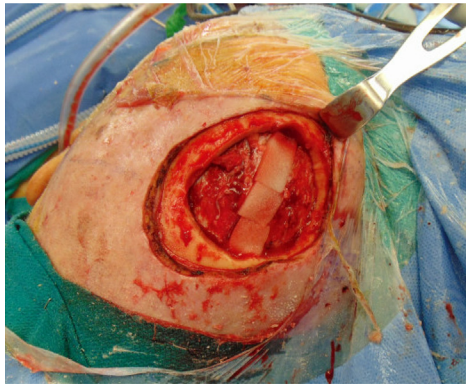


Fig 3. Mesh cranioplasty after craniectomy procedure for left frontal squamous cell carcinoma intracranial invasion management.

bed and lymph node basin, close postsurgical follow-up, and discussion of adjuvant therapy. At our institution, these patients are followed every 3 to 4 months for examination and every 6 months for surveillance imaging of the nodal basin.³ In patients with high-risk SCC, it is important to maintain a high level of suspicion for recurrence and evaluate patients in person for any postsurgical complaint with a low threshold for biopsy.

In a retrospective study on cutaneous, sinonasal, and middle ear tumors invading the skull, the most common tumor was cSCC.⁴ In this study, most patients with cSCC skull invasion were males aged 53 to 86 years, had the tumor on a skull convexity, and demonstrated moderately differentiated cSCC.⁴ Our patient had all of these characteristics. On further analysis of treatment history, multiple patients with skull-invasive cSCC had a history of multiple excisions/resections before undergoing neurosurgery.⁴ If our patient did not present with persistent drainage, negative infectious workup results, or bone fragment recovery during incision and

drainage, it is possible that his recurrent SCC would not have been identified until much later. Initial magnetic resonance imaging would have been better than CT if we were highly suspicious of intracranial invasion.⁵ However, suspicion was initially high for skull and lymph node invasion, not intracranial invasion.⁵

Recurrent or metastatic cSCC is rare in the short-term Mohs postoperative period. Maintaining a high level of suspicion for tumor recurrence on the basis of baseline high-risk factors and persistent lesion drainage led to a quick turnaround for identifying and managing SCC recurrence and progression. If a surgical site does not appear to heal appropriately, despite negative infectious workup results, then additional tumor recurrence workup, including re-imaging, may be warranted. Our case supports the use of various diagnostic modalities and interdisciplinary input for optimal management.⁵

Conflicts of interest

None disclosed.

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