Unusually Aggressive Squamous Cell Carcinoma of the Scalp

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ABSTRACT

Objectives: To report a series of unusually aggressive squamous cell carcinoma of the scalp and to discuss the current strategies for the diagnosis and management of this disease state.

Study Design: Case Series and literature review

Methods: Patients with well and moderately well-differentiated scalp squamous cell carcinoma, presenting with locally invasive disease and aggressive features were identified. We performed a chart review for each patient in this series. The literature is reviewed as it pertains to prior reports and diagnostic strategies for identifying these uncharacteristically aggressive lesions.

Results: We present a series of six patients with well-differentiated and moderately-well differentiated squamous cell carcinoma of the scalp that behaved in an unusually aggressive pattern for its level of differentiation. This included local invasion of calvarium and recurrence at the primary site. We did not identify in this case series any correlation between the degree of differentiation and the aggressiveness of the cancer. We did not elucidate any risk factors or histologic identifiers to explain this phenomenon, which has not been previously described in the head and neck literature.

Conclusions: Squamous cell carcinoma of the scalp may behave aggressively; including bony invasion and recurrence at the primary site, despite low histologic grade. The clinician should be aware that these locally aggressive features, typically associated with poorly differentiated squamous cell carcinomas, may exist with any level of differentiation when found on the scalp and require an intensive treatment regimen for disease control.

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INTRODUCTION

Squamous cell carcinoma is a common cutaneous lesion of the scalp. Standard treatment protocols are effective in managing most lesions. We report 6 unique cases of squamous cell carcinoma of the scalp that behaved in an unusually aggressive manner for its histologic grade. We describe the intensive treatment of this aggressive lesion, that may be encountered in one's head and neck practice.

DISCUSSION

Cutaneous lesions of the scalp are a common presentation in head and neck surgery. Skin cancers of the scalp have a propensity to spread, due to the subgaleal plane that provides limited resistance. At the periosteal level, tumor spread can go for unperceived distances.[1] Furthermore, its vigorous blood supply and dense lymphatics create further potential for spread of disease, making the scalp a high risk site.

High histologic grade in addition to size and depth of invasion had previously been associated with worse biologic behavior in squamous cell carcinoma. In the setting of Mohs micrographic excision, Brodland and Zitelli cite that lower grade squamous cell carcinoma tumors require a 4mm margin, whereas high histologic grade tumors require a 6mm margin for improved clearance rates.[2]

In this patient series we review 6 cases of well to moderately well differentiated squamous cell carcinoma of the scalp. These cases would fall in the low histologic grade category. However, within this series we identify biologic behavior that goes against this grading system. Patients 1, 2, 4, and 5 had gross bony invasion by the tumor. (Figure 1.) Patients 1, 3, and 6 presented as a recurrent lesion at the site of a previously excised tumor. These cases contradict the idea that low histologic grade confers reassurance of biologic behavior.

Histologic analysis of the primary specimen, widely excised margins, and deep margins that included bone in 4 out of 6 our patients was completed with hemotoxylin-eosin stain, demonstrating bony invasion (Figure 2), in the setting of Keratin pearls and minimal pleomorphism consistent with well-differentiated squamous cell carcinoma. (Figure 3).

Case #	Age	Sex	Histological Grade	Bone Involvement	Same Site Recurrence	Metastases	Treatment Course	Complications
1	83	M	Well-differentiated	Yes	Yes	No	Excisional biopsy followed by left scalp excision, left craniectomy, dural resection, sentinel lymph node biopsy and reconstruction. Completion of adjuvant radiation. No cancer recurrence after 16 months.	None
2	87	F	Well-differentiated	Yes	No	No	Wide local excision, drilling of the outer table of the calvarium, and reconstruction with a split-thickness skin graft from the right thigh. No recurrence two months postoperatively.	Erosive pustular dermatosis.
3	77	F	Moderate to well-differentiated	No	Yes	No	Mohs micrographic excision followed by local flap repair. Seven months later the patient had recurrence of squamous cell carcinoma at the same site and elected for radiation therapy, which she has not yet completed.	None
4	67	M	Moderately well-differentiated	Yes	No	No	Mohs micrographic excision of the lesion with removal of superficial table of the calvarium and defect reconstruction. There was evidence of perineural invasion so the patient completed adjuvant radiation therapy. No recurrence seven months postoperatively.	Lower leg deep vein thrombosis. Site infection.
5	88	M	Moderately well-differentiated	Yes	No	No	Mohs micrographic excision, resection of the outer table of the calvarium and local flap closure of the defect. Completion of adjuvant radiation therapy. No recurrence four months postoperatively.	None
6	69	M	Well-differentiated	No	Yes	No	Wide local excision and reconstruction with split-thickness skin graft from the lower extremity. Three weeks of adjuvant radiation completed prior to wound breakdown. No cancer recurrence postoperatively.	Post-radiation wound breakdown and bone exposure.

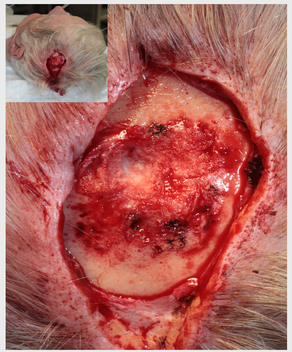

Figure 1. Mohs defect revealing involved outer table of calvarium. Inset shows gross anatomic location of lesion.

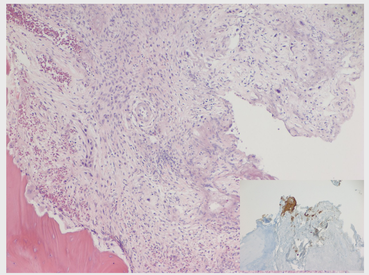

Figure 2. Hyperchromatic and spindled malignant cells penetrate the periosteum of the underlying bone deep to the tumor, as highlighted by the pankeratin immunostain (Hemotoxylin-eosin stain; original magnification: x10) (Inset: Pankeratin stain; original magnification: x10).

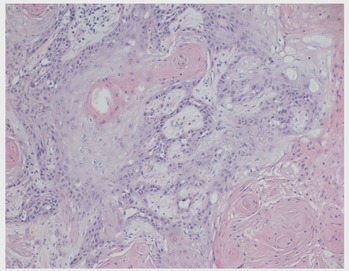

Figure 3. In this well-differentiated tumor, the neoplastic squamous cells demonstrate minimal pleomorphism. Keratin pearls and intercellular bridges are readily seen. (Hemotoxylin-eosin stain; original magnification: x10)

DISCUSSION

Immunohistochemical staining of the specimens did not reveal an identifiable pattern separating these aggressive lesions from less aggressive scalp squamous cell carcinomas.

Within this series, we did not identify any specific risk factors that would separate these patients from other patients with lower risk squamous cell carcinoma of the scalp. Age, sex, size, immunosuppression, and/or previous radiation exposure were not identified as clear risk factors.

Bone invasion is associated with later stages of local spread. Petrovich et al demonstrated good tumor control in T4 cutaneous lesions in the head and neck region by utilizing radiation therapy.[3] Recognizing the unusually aggressive features of the tumors in our series, each patient was offered adjuvant radiation therapy after excision and reconstruction of the primary lesion.

In our six was no evidence of recurrence or metastases in short-term follow-up after completion of therapy. However, we believe that without intensive treatment their tumors would have quickly progressed to both morbid local disease and distant metastasis.

CONCLUSIONS

- Squamous cell carcinoma of the scalp can behave in an aggressive manner despite low histologic grade.

- There are no identifiable risk factors or histologic features to predict this aggressive behavior.

- If locally aggressive features are suspected, then the lesion must be treated aggressively with wide excision, clear margins, including involved calvarium, defect repair, and adjuvant radiation therapy.

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