Case Report

Intracranial Extension of Squamous Cell Carcinoma of the Scalp: A Case Report

Selçuk GÖÇMEN1, Bilge Kağan AYSAL2, Ahmet EROĞLU1, Cihan ŞAHIN2, Fatih UYGUR2, Mehmet Nusret DEMIRCAN1

1Gulhane Military Medical Academy, Haydarpasa Training Hospital, Department of Neurosurgery, Istanbul, Turkey 2Gulhane Military Medical Academy, Haydarpasa Training Hospital, Department of Plastic Surgery, Istanbul

Summary

Skin cancers occur rarely in the scalp. Especially, direct intracranial invasion by a squamous cell carcinoma of the scalp is extremely rare. We presented a case of a 76-year-old woman who developed a large destructive squamous cell carcinoma with extension through the calvarium and the central nervous system. There was not distant metastasis, wide-surgical excision of the lesion and covering defect was performed by Neurosurgery and Plastic Surgery Departments. Aggressive scalp carcinomas may develop the skull invasion, dural infiltration and brain involvement as in our case. Early diagnosis and surgery are mandatory to regain best possible recovery for scalp malignant tumors.

Key words: Cranial invasion, Intracranial extension, Scalp carcinoma, Squamous cell carcinoma

INTRODUCTION

Squamous cell carcinoma (SCC) is the most common form of skin cancer after basal cell carcinoma (BCC) (21). It is biologically more aggressive than basal cell carcinoma (15). It arises from malignant proliferation of the epidermal keratinocytes (2). It usually occurs at sites of high cumulative chronic ultraviolet light exposure, and 80% to 90% of these cancers develop on the sun exposed skin of the head and neck in older white men (2).

SCC comprises locoregional malignant tumors with more rapid and severe spread, high metastasize potential through blood and lymphatic vessels, however the invasion of the central nervous system (CNS) is very seldom. We report a case of...
an aggressive squamous cell carcinoma of the scalp with direct intracranial invasion.

CASE PRESENTATION

A 76-year-old woman admitted to plastic surgery department with a non-healed frontal scalp lesion. This slowly growing lesion had been neglected for 2 years. The rapid growth phase began in the last 2 months. Patient had a history of dementia and hypertension. Examination revealed a painful, bleeding, exophytic, irregular bordered, heterogeneous ulcerated tumor, measuring 14x6 cm in the frontal region of the scalp (Figure 1A). There was no palpable lymphadenopathy or hepatosplenomegaly. No significant neurological abnormality was noted on examination. An incision biopsy confirmed a squamous cell carcinoma (SCC) of skin. A magnetic resonance imaging (MRI) showed frontal bone invasion, underlying dura mater and involvement of sagittal sinus (Figure 2). Whole body screening showed no evidence of distant tumor metastases.

Since there was not distant metastasis, wide-surgical excision of the lesion was decided by an operational team of neurosurgery and plastic surgery. Treatment included resection of the SCC and the affected skull and macroscopic debridement of the dura. The surgical plan was to reach tumor free margins at the skin, bone, dura, and sagittal sinus. The tumor was excised with a 2 cm tumor free margin in skin and the involved frontal bone. At the excision of tumor which invaded underlying dura mater and sagittal sinus, an intraoperative decision was made to stay palliative due to more bleeding than expected. The ensuing scalp defect was covered with a large parietooccipital transpositional flap (Figure 1B). The donor site of flap was covered by a split thickness skin graft harvested from the anterolateral femoral area. Although all tumor-free margins were reached in the skin, there still was an invaded part in the dura mater and sagittal sinus. By these means, we achieved the aim of clearance of tumor from skin, frontal bone, covering the skin defect, controlling the locally and distant spreading of tumor. No serious post-operative neurological, local and systemic complications were occurred. The patient would receive additional radiotherapy. The patient was transferred to internal medicine intensive care unit due to uncontrolled systemic arterial hypotension and died 3 weeks after surgery.

Figure 1: A) Patient with a large scalp wound. B) Post-operative photo showed covering defect and reconstruction.
DISCUSSION

Malignant skin tumors may arise from the surface epithelium or its cutaneous appendages\(^{(18)}\). These tumors rarely occur in the scalp but in general, unless promptly identified and managed, tumors of the scalp will grow rapidly and infiltrate the underlying cranium and occasionally the dura\(^{(18)}\). As part of the management of these lesions, reconstruction of large scalp and/or skull defects often poses difficulties and significant surgical challenges\(^{(18)}\). Lang et al recommend that scalp tumors be managed in an aggressive and appropriate manner because of their association with morbidity and mortality\(^{(11)}\).

There have been rare reports in which skin tumors of the scalp with direct intracranial invasion, including SCC, BCC, Basosquamous carcinoma, adnexal carcinoma [Giant eccrine adenocarcinoma, benign dermal cylindroma, Familial cylindromatosis (Turban tumor syndrome)], Merkel carcinoma, Marjolin's ulcer, dermatofibrosarcoma, sebaceous carcinoma, melanoma (Figure 3)\(^{(1,3-10,12,15-20,22)}\).
SCC of the scalp with direct intracranial extension has been very rarely reported in the English literature(1,2,3,6,7,11,13,14,18). This usually happens by intraosseous and intradural spread. The dura mater is a strong barrier for skin tumors and known to prevent deep local invasion(14). Some authors have described the sagittal sinus involvement(6,18). All reported cases had begun as growing ulcerative lesions which were neglected by patients.

In case of tumors with CNS involvements, the clinical findings vary depending on the affected area. Most common findings are headache, papilla edema, and vomiting, which develop secondary to the intracranial pressure increase(14).

SCCs are cured with the treatment modalities, which may include topical chemotherapy (5-fluorouracil), topical immune response modifiers, systemic chemotherapy, immunosuppression reduction, cryosurgery, photodynamic therapy, electrodessication and curettage, local excision, and Mohs micrographic surgery (MMS)(2,13). Soma et al recommend aggressive surgical management offers for scalp cancer with involvement of the skull and dura with or without involvement of the brain(18). A multidisciplinary approach (plastic surgery, neurosurgery, neuro-oncology and pathology) is very important in preoperative course, intraoperatively and in postoperative course(18). Involvement of the dura and bone necessitates a bone dura resection. Large defects can be reconstructed with skin grafts, rotational flaps, distant pedicled flaps, transposition flaps following tissue expansion or free flaps(3,18). Radiation therapy and/or chemotherapy have been used with different response rates(18).

Tumors which involved and infiltrated the superior sagittal sinus preclude complete dural resection because of the significant risk of venous thrombosis and resulting venous infarction(18).

Prognostic factors of SCC of the skin include histologic features (differentiation, thickness, depth of invasion, and perineural involvement), clinical size, etiology, immune status of the patients, and anatomic site of the tumor (ear, lip, nasolabial creases, periorbital, and preauricular regions)(14). PNI, in cases of SCC of the skin of the head, is considered to poor prognosis(14). An aggressive surgery is the essential of the head and neck skin tumors (SCC, basal cell carcinoma, and basosquamous carcinoma) which extend into the CNS, because of their association with morbidity and mortality as in our case.

In conclusion, we present an elderly patient with a large and aggressive scalp SCC, dura mater and deep sagittal sinus involvement, who had much other systemic comorbidity. MRI should be performed for a large and aggressive skin tumor of the scalp before the surgery. Early diagnosis and aggressive surgery are mandatory to regain best possible recovery for scalp malignant tumors.

**Correspondence to:**
Selçuk Göçmen
E-mail: s_gocmen@yahoo.com

**Received by:** 06 June 2012  
**Revised by:** 05 November 2012  
**Accepted:** 05 November 2012
REFERENCES