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Case Report

Recurrent Squamous Cell Carcinoma of the Scalp: A Case Report Emphasizing Early Detection

Sandeep Goud Mitta [1]*, Sannidhi Tanvi [2], Arelli Kavya [2], Sahedur Rahaman [2], Khursed Alam [2]

[1] Assistant Professor, Department of Pharmacy Practice, Vaagdevi Pharmacy College, Bollikunta, Warangal, Telangana, India, 506005

[2] Student, Department of Pharmacy Practice, Vaagdevi Pharmacy College, Bollikunta, Warangal, Telangana, India, 506005

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*For Correspondence:

Sandeep Goud Mitta, Assistant Professor, Department of Pharmacy Practice, Vaagdevi Pharmacy College, Bollikunta, Warangal, Telangana, India, 506005

Abstract

Objective: To illustrate the clinical presentation, diagnostic difficulties, and treatment strategy of a patient with scalp squamous cell carcinoma and to emphasise the importance of early detection and interdisciplinary care for improved patient outcomes.

Design: This case report provides a comprehensive account of the patient's clinical presentation, diagnostic process, and treatment approach.

Background: Cutaneous squamous cell carcinoma (SCC) of the scalp is the second most common non-melanoma skin cancer after basal cell carcinoma, with incidence rising due to increasing ultraviolet radiation exposure. While scalp SCC constitutes a significant proportion of cutaneous malignancies, cerebral invasion is uncommon. We report a case of a 64-year-old male who developed a non-healing scalp ulcer following head trauma, persisting for three months. Contrast-enhanced computed tomography (CECT) revealed a heterogeneously enhancing parietal scalp lesion with small enhancing cervical lymph nodes. Histopathological examination confirmed moderately differentiated SCC. The patient was managed surgically following appropriate preoperative preparation. This case emphasizes the importance of early recognition and timely intervention in scalp SCC to prevent disease progression, morbidity, and regional metastasis.

Intervention: The patient underwent wide local excision of the scalp lesion with adequate surgical margins, followed by primary closure of the defect. Postoperative wound care was provided, and the excised tissue was sent for histopathological examination to confirm complete tumor clearance.

Main Outcome Measure: Postoperative recovery, wound healing, and confirmation of complete tumor clearance on histopathology.

Results: Surgical management resulted in complete excision of the lesion with histopathological confirmation of negative margins. The patient's recovery was satisfactory, and subsequent follow-ups demonstrated disease-free survival.

Conclusion: This report emphasizes that thorough clinical evaluation, appropriate surgical intervention with clear margins, and consistent follow-up play a crucial role in achieving optimal prognosis in patients with scalp SCC.

Keywords: Squamous cell carcinoma, Scalp tumors, non-healing ulcer, Trauma-induced SCC, Surgical management

Introduction

The layered structure of the scalp gives it a distinctive anatomy. The skin, loose areolar connective tissue, galea aponeurotica, connective tissue, and pericranium are the five layers that make up the scalp. A complex network of capillaries and lymphatics envelops the scalp's many pilosebaceous follicles. Lymphatic drainage is directed into the parotid glands, the upper neck, the occiput, and the pre- and postauricular areas [1]. The second most common malignant tumor is cSCC, and the frequency of scalp malignancies is also rising. This site may be regarded as an independent risk factor for invasiveness, a greater chance of recurrence, and consequently a more negative prognosis, in part because cSCC of the scalp is frequently detected at an advanced stage [2]. The head and neck are the most frequently afflicted locations for skin cancers because of the high levels of UV radiation exposure. Immunosuppression, long-term wounds, fair skin, male sex, advanced age, a number of genetic disorders, exposure to the environment, including UV light, and a prior history of squamous cell carcinoma are risk factors. The lymph nodes are the most common site of metastasis, despite their rarity. Compared to cancers that form elsewhere on the skin, the incidence of scalp tumors is rising. Although squamous cell carcinoma on the scalp is becoming more common, cerebral extension is uncommon. Although they make up to 13% of all malignant cutaneous neoplasms, only 1%–2% of all

scalp tumors are malignant, with cutaneous squamous cell carcinoma ranking as the second most common type. Scalp SCC is typically identified prior to its expansion into the skull because of its slow growth. Rarely does it invade the dura mater, cortex, or bone. Timely surveillance, early diagnosis, and fast treatment are crucial to reducing the risks of morbidity and mortality as the frequency continues to rise, raising serious public health concerns. Regular full-body skin examinations and photoprotection are advised. Although surgical excision is used to treat the majority of cases, new therapeutic approaches are always being developed. In more severe situations, radiation therapy and systemic oncologic therapy can be necessary [3,4].

For scalp surgery, preparation is essential. To avoid contamination, perilesional hair should be fastened and cut at least 1 cm away from the incision site. A 10-minute wait after administering lidocaine with epinephrine enhances hemostasis and visibility since the scalp has a rich vascular network that can result in severe bleeding. Tumescent anaesthetic also lessens bleeding and facilitates dissection. For efficient pain management, hemostasis can be attained by compression, ligation, or electrocautery, and anaesthetic infiltration should be restricted to subcutaneous or intradermal layers. Multidisciplinary cooperation between dermatologists, plastic surgeons, neurosurgeons, and head and neck surgeons is frequently required for large or invasive scalp malignancies.

Low-risk cutaneous squamous cell carcinomas (cSCCs) can be quickly and affordably treated with curettage and electrodesiccation. Electrodessication is applied, often in three cycles, after the lesion is scraped to normal dermis. Evidence from randomized or prospective studies is inadequate, despite the fact that it is helpful for small (<2 cm), superficial, low-risk lesions. Due to potential follicular tumor extension and the lack of histologic margin control, results may be worse in hair-bearing regions [5]. Depression is observed among such group of patients and targeting depression be a useful target for interventions aimed at improving subjective health and quality of life [6].

The main treatment for cutaneous squamous cell carcinoma (cSCC) is conventional wide local excision, which involves removing the tumor with a margin of normal-looking skin and evaluating the histological margin using the bread-loaf technique. Retrospective studies demonstrate favourable results despite the lack of randomized trials, with local recurrence rates of 3–16% (often ≤6%) and regional metastatic rates of 1–4%, increasing to 5–14% in head and neck cases and 7–9% on the scalp. The most important predictor is achieving distinct margins. Excision margins of 4–10 mm, adjusted for tumor size and location, are supported by evidence from studies, including those employing Mohs micrographic surgery, to guarantee total removal in more than 95% of instances.

Cutaneous squamous cell carcinoma (cSCC) is thought to be more likely to occur on the scalp. For high-risk patients, excision with intraoperative margin control is ideal, but it is frequently unavailable, hence routine excision is used to treat many scalp cSCCs. The NCCN recommends ≥4 mm for tumors smaller than 1 cm, ≥6 mm for tumors between 1 and 1.9 cm, and ≥9 mm for lesions larger than 2 cm. Wider margins are advised for cancers that exhibit poor differentiation, perineural invasion, or deep tissue involvement. Minimum margins of 5 mm and 6–10 mm, respectively, are recommended by European and British rules. In general, scalp cSCCs should be removed with peripheral margins of at least 5–6 mm; for high-risk characteristics, this should be extended to ≥10 mm.

The best deep surgical plane for routine scalp cSCC excision is still up for debate. Excision at the hypodermis, incorporation of subcutaneous fat, or moving on to the next clean plane are some of the suggested methods. However, because it offers a strong barrier against tumor invasion, the BAD, European, and Scottish guidelines advise including the galea aponeurotica in the excision. Additionally, there are fewer close or positive margins when cutting to or beyond the galea.

To lower the chance of leaving behind leftover tumor cells, reconstructive techniques for scalp cSCCs, a high-risk region, should refrain from rotating tissue or changing the surgical bed. Primary linear repair, split- or full-thickness skin grafts, dermal matrices, or secondary intention healing are preferred closure alternatives, particularly in situations when Mohs surgery is not an option. When the periosteum is removed, bone is exposed, or previous radiation therapy has been administered, skin grafting is especially helpful.

Due to restricted tissue mobility, medium to large scalp defects (2–5 cm or more) can be challenging to seal; local flaps may be required in these situations, but they should be postponed until distinct histologic margins are verified. Staples are favoured due to their quickness, while subcutaneous sutures are typically avoided to prevent alopecia and harm to hair follicles. [5]

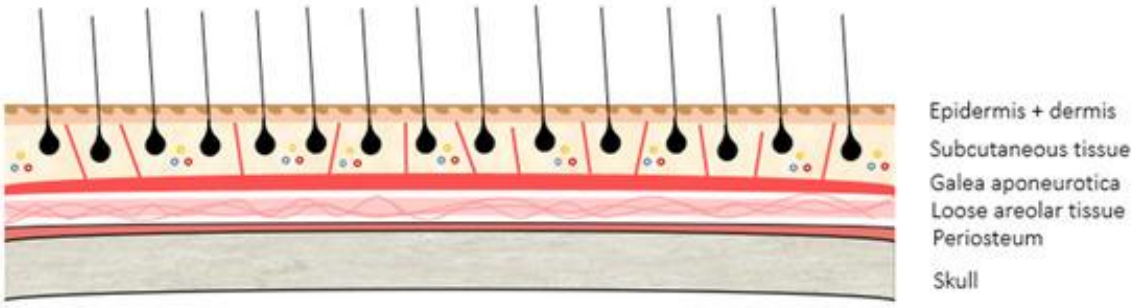

Figure 1: The five layers of the scalp's anatomy—the epidermis + dermis, subcutaneous tissue, galea aponeurotica, loose areolar tissue, and periosteum—are depicted graphically. Through the subcutaneous layer (tiny, colour circles), next to fibrous tracts, are blood arteries, lymphatics, and nerves [5].

Case Presentation

A 64-year male patient was brought to the oncology department with the chief complaints including non-healing ulcer over the scalp in the past 3 months. Patient was asymptomatic 3 months ago then he developed non healing ulcer on the scalp followed by trauma on head. Ulcer was initially small progressive in size even after regular cleansing. Patient weighed 65kg. On examination, he was conscious with pulse rate 84/min, respiratory rate 18/min, BP 120/80 and Saturation levels 98%. His CECT showed focal heterogeneously enhancing soft tissue thickening noted in scalp at parietal region, measuring: 3.3*2.8*0.3cm (AP*TR*CC), Evidence of small heterogeneously enhancing lymph nodes noted in right IA, left level II regions, largest measuring: 9*5mm. His Histopathology report showed moderately differentiated squamous cell carcinoma.

Table 1: Laboratory Investigations

S.NO	PARAMETER	RESULTS	NORMAL RANGE
1.	Hemoglobin	10.43 g/dl	13.00 – 17.00 g/dl
2.	Packed Cell Volume	23.8%	40 – 50%
3.	Red Blood Cells	2.84 mill/cumm	4.5 – 6 mill/cumm
4.	White Blood Cells	11,400 cells/cumm	4000 – 11,000 cells/cumm
5.	Neutrophils	81%	45 – 75%
6.	Lymphocytes	15 %	20 – 40 %
7.	Eosinophils	02 %	1 – 6 %
8.	Monocytes	02 %	2 – 10 %
9.	Basophils	00 %	0 – 1 %
10.	Platelet Count	2.3 lakhs/cumm	1.5 – 4.5 lakhs/cumm
11.	Total Bilirubin	0.30 mg/dL	0.0 – 1.2 mg/dl
12.	Direct Bilirubin	0.1 mg/Dl	0.0 – 0.3 mg/dl
13.	Indirect Bilirubin	0.2 mg/dL	0.4-1.0 mg/dl
14.	SGPT	24.58 U/L	0.0 – 40.0 U/L
15.	Serum Creatinine	0.86 mg/Dl	0.6 – 1.3 mg/dl
16.	Blood Urea	30.86 mg/dL	15.0 – 45.0 mg/dl
17.	Random Plasma/Serum Glucose	85.53 mg/dL	80 – 140 mg/dl
18.	Serum Sodium	138 mmol/L	135 – 145 mmol/L
19.	Serum Potassium	3.25 mmol/L	3.5 – 5.3 mmol/L
20.	Serum Chlorides	111 mmol/L	98 – 107 mmol/L
21.	Alkaline Phosphate	75.0 U/L	40 – 129 U/L

On considering all the laboratory parameters the patient was diagnosed with squamous cell carcinoma of scalp. He was suggested for a Head and Neck surgery.

Table 2: Pre and Post-Op Medication

Pre OP Orders				
S. No	**Drug**	**Dose**	**Frequency**	**ROA**
1	Inj. IVF NS RL	1:1@80ml/hr	STAT	IV
2	Inj. Augmentin	1.2 gm	STAT	IV
3	Inj. Xylocaine		STAT	IV
4	Inj. Pantop	40 mg	STAT	IV
5	Inj. TT	0.5 ml	STAT	IM
6	Tab. Alprax	0.25 mg	STAT	PO
7	Npo from midnight 11:00 pm			
8	Consent and parts prep			
9	Shift to ot on call with all files and reports			
10	Iv cannula left hand before shifting			
11	Rhino set n/d 2 drop before sleep and early morning			
12	Betadine gargles at night and 6 am morning			
Post OP Medication				
S. No	**Drug**	**Dose**	**Frequency**	**ROA**
1.	T. Augmentin	625 mg	BD	PO
2.	T. Pantop	40 mg	OD	PO
3.	T. PCM	1g	QID	PO
4.	T. B-Complex	1 tab	OD	PO
5.	T. Vitamin –C	1 tab	OD	PO

Results

S.NO	**PARAMETERS**	**FINDINGS**
1	Type of lesion	Non-healing ulcerative lesion over the parietal region of the scalp.
2	Surgical intervention	Wide local excision with adequate tumor-free margins.
3	Histopathological findings	Moderately differentiated squamous cell carcinoma with no lymph vascular or perineural invasion.
4	Margin status	Clear / Negative margins confirmed.
5	Postoperative course	Uneventful recovery with satisfactory wound healing.
6	Reconstruction	Primary closure of the defect (or flap/graft if applicable).
7	Follow-up period	3–6 months.
8	Outcome	No local recurrence or metastasis observed during follow-up.
9	Overall result	Successful tumor excision and complete recovery.

Discussion

Squamous cell carcinoma (SCC) of the scalp, although relatively uncommon, is becoming more frequent due to increased ultraviolet (UV) exposure, immune-suppression, and other environmental factors. The anatomical layers of the scalp, including the skin, connective tissues, and underlying bone, provide an intricate structure that can make early detection challenging. The patient in this case presented with a non-healing ulcer on the scalp that initially developed following trauma. This underscores the importance of monitoring any persistent or unusual skin changes, especially in individuals at risk, such as those with fair skin, a history of UV exposure, or immunosuppressed states.

The patient's imaging studies revealed soft tissue thickening and small lymph nodes, suggesting the possibility of regional metastasis. However, the presence of heterogeneously enhancing lymph nodes does not definitively indicate malignant spread, and further diagnostic workup is essential. Histopathology of the lesion confirmed moderately differentiated squamous cell carcinoma, which is known for its slow growth and potential for local invasion. Interestingly, while scalp SCC has a tendency to remain localized, it can rarely extend to the underlying bone, dura mater, or even the brain, although these occurrences are infrequent.

Laboratory findings revealed mild anemia and a slightly elevated white blood cell count, possibly indicating a mild inflammatory response or infection. These parameters were consistent with the patient's history of a chronic ulcerative lesion, but no significant abnormalities were noted in other tests. Preoperative preparation included intravenous antibiotics, tetanus toxoid, and standard analgesia, ensuring the patient was optimally prepared for surgery. Postoperative medications included antibiotics and analgesics to manage potential infection and pain, as well as vitamins to support recovery.

Early diagnosis and treatment are paramount in managing scalp SCC to reduce the risks of metastasis and recurrence. Surgical excision remains the cornerstone of therapy, with radiation therapy and systemic treatments reserved for more advanced cases or those with high recurrence risk. Regular follow-up, including full-body skin examinations and imaging, is crucial for detecting recurrence or metastasis at an early stage.

Conclusion

This case report highlights the clinical and pathological features of squamous cell carcinoma of the scalp, which is increasingly diagnosed due to environmental and demographic changes. The patient's presentation, diagnostic workup, and treatment approach illustrate the importance of early recognition and intervention. Scalp SCC is associated with a higher risk of recurrence and metastasis if not detected early, underscoring the importance of regular skin checks and prompt treatment. A multidisciplinary approach, including surgical excision, postoperative care, and surveillance, is essential for achieving the best possible outcome for patients with this malignancy. This case also emphasizes the need for public awareness of the risk factors associated with SCC and the role of preventive measures like UV protection and regular skin screenings.

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Ethical compliance statement: The authors confirmed that patients provided written informed consent for the publication of the literature.

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