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"Squamous Cell Carcinoma of scalp extending to skull" A Case Report and Review of Literature

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ABSTRACT: The second most common type of malignant skin cancer is squamous cell carcinoma (SCC). Bone infiltration is infrequent, and invasion of the dura mater and brain parenchyma are both unusual and only likely to occur in more severe cases of the illness. Advanced SCC is difficult to treat and frequently necessitates the cooperation of a multidisciplinary team to provide both local and systemic treatment. This article describes how to treat advanced SCC of the scalp that involves the bones and meninges and exposes the brain. A 51-year female presented with advanced SCC of the scalp. A vegetative and infiltrating neoplastic ulcer of the frontal, temporal and parietal regions with underlying bone destruction. The neoplastic tissue was covered by blood, fibrin, and bacterial colonization. The patient received palliative care in a local hospital with daily dressings for 8months. However, the ulcero-proliferative growth kept spreading and invading surrounding and underlying structure. Therefore, the patient underwent wide local excision of the ulcer with 2.5cm margin with transpositional flap and split skin grafting. Additionally, burr holes were created in the outer table of the skull for granulation tissue regeneration for further wound grafting.

KEYWORDS: Skin cancer, Squamous cell carcinoma, scalp, cutaneous, wide local excision, flap, graft

I. INTRODUCTION

Skin cancer can affect any other region of your body, it can also damage your scalp. These malignant tumours can be melanoma, squamous cell carcinoma, or basal cell carcinoma. However, they frequently go unreported because scalp skin cancer might be hidden by hair or found in a difficult-to-check area of the scalp. Skin cancers, especially those on the scalp, which make up 13% of all skin cancers, are most frequently caused by sun exposure[1].

Types of Skin Cancer Affecting the Scalp

Scalp is susceptible to developing several skin cancers. The two most typical types, squamous cell carcinoma and basal cell carcinoma, are thought to be quite treatable. Melanoma is a more uncommon and dangerous type of cancer that, if discovered in its early stages, is still curable[2].

Basal Cell Carcinoma(BCC):In United States, it affects more than 3.5 million people annually and is most prevalent type of skin cancer. It begins in the deepest layer of the epidermis which is the basal cell layer [3]. Approximately 40% of scalp tumours are BCC. The tumours are frequently discovered on skin that has been exposed to the sun, such asscalp, head, face, and neck [4].

Squamous Cell Carcinoma(SCC):These are flat,resemble scales and are found on the surface of the epidermis, are the origin of the cancer known as squamous cell carcinoma[5]. With more than a million instances detected in the United States each year and an estimated 1.8 million cases of scc, it is the second most frequent type of skincancer [6]. Squamous cell carcinoma is more serious because it is more likely to develop and metastasis (spread), even though it is less prevalent than basal cell carcinoma [7].Melanoma:Despite being less frequent than BCC and SCC, melanoma is the most deadly of the three. Melanoma can quickly spread to other body organs if it is not treated [8]. On the scalp, melanomas account for 3% to 6% of all cases. Melanoma can appear as moles, lesions, ulcers, and other diverse things. It can also seem as a pink or skin-coloured protrusion that can enlarge and bleed. It can be colourless in some instances [9]. Melanoma on the scalp is more likely to spread since it is simple to overlook (or confuse for other medical issues). In fact, the diagnosis of a scalp

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melanoma occurs in about one in eight cases when the cancer has already gone to the brain [10].

Uncommon Types:Merkel cell carcinoma, Kaposi sarcoma, cutaneous lymphoma, sebaceous gland carcinoma, and certain sarcomas are skin cancers that less frequently affect the scalp. Less than 1% of all skin cancers are represented by them [7].

BASAL CELL CARCINOMA	SQUAMOUS CELL CARCINOMA	MELANOMA
Flat lesion on skin.	Open soar on skin.	Large brown spotonskin which may looks like a mole.
Flesh coloured waxy or "pearly" bump on skin,often with fine pink or red lines visible on the surface.	Firm, red bump that grows rapidly or indented spot in the middle of the bump which is tender to touch.	A mole that changes size, color, itches, or bleeds Remember "ABCDE"
A soar which doesn't heal, or keepshealing and then coming back.	Thick, scaly, crusted or "warty" patch on your skin.	**A**symmetry: Are two sides of your mole different?
		Border: Regular or jagged?
		Color: Is the mole one color or varied throughout
		Diameter: Is mole over 6mm? This is common for melanoma, but can be smaller
		Evolving: change in size, shape, colour?

Causes and risk factors

The primary cause of skin cancer is ultraviolet (UV) exposure from the sun or tanning beds[11]. The area of your body that is most frequently exposed to the sun is your scalp, making it particularly sensitive if you are bald or have thinning hair. In spite of having a full head of hair, you can still develop scalp cancer.

Additional skin cancer risk factors are:

- History of previous cutaneous trauma
- Fair skin tone.
- Skin that burns, reddens, or freckles easily in the sun.
- Population with blue or green eyes; blond or red hair.
- Having large number of moles.
- Older age (due to many more years of sun exposure).
- Having a family or personal history of skin cancer.

SQUAMOUS CELL CARCINOMA

The head and neck are the most frequent areas of involvement, typically affecting older patients[12]. Although; the exact incidence is unknown, it has grown in recent years[13]. According to a recent study, advanced SCC occurs in around 2.1% of cases[14]. The initial line of treatment is surgery, which is followed by radiotherapy and systemic therapies.A 90% 5-year survival rate has been recorded, making early prognosis possible[15]. For advanced SCC that is inoperable or metastatic SCC, cemiplimab is currently the systemic therapy recommended[16]. Invasion of the dura mater and brain parenchyma is uncommon and only happens in more advanced stages, as does bone infiltration. Advanced SCC management is difficult and frequently necessitates the cooperation of a multidisciplinary team to deliver local and systemic treatment[17] [18].

Management of cutaneous squamous cell carcinoma includes the following:

- A clear margin surgical excision, as seen by frozen sections.
- Mohs micrographic surgery for facial invasive cSCC.
- Radiation therapy as a main treatment option for patients unable to undergo surgical excision, as an adjunct to surgery to improve locoregional control.
- Chemotherapy can be used as adjuvant therapy in some of the highest-risk instances, such as when 5-fluorouracil (5-FU) and EGFR inhibitors are taken orally.
- Systemic chemotherapy for metastatic cSCC.

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The current case report described advanced SCC of the scalp involving bones and extension into extra-dural space.

II. CASE REPORT

A 51-year- female presented to the Neurosurgery department of Subharti medical college, Meerut, Uttar Pradesh India for local management of an advanced SCC of the scalp. A vegetative and infiltrating neoplastic ulcer of 26cmx21cm of the left frontal, temporal and parietal regions was observed, with bony destruction. The brain parenchyma was not affected, and the patient showed no neurologic symptoms. The patient complaints of occurrence of a small painless nodule on the left parietal region 9 months ago which grew rapidly and aggressively with ulceroproliferative changes. The neoplastic tissue was covered by blood, fibrin, and bacterial colonization (Figure 1). The patient had a significant past history of mechanical trauma to the same anatomical region due to grass churning machine while working in the farmland 17years ago for which patient underwent conservative management with local dressings.

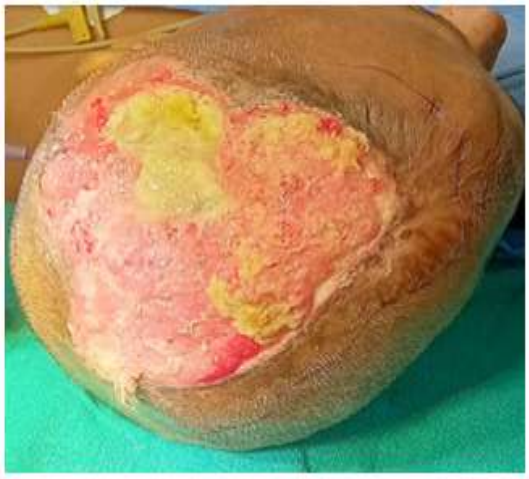

FIGURE 1

Ncct head shows gross destruction of soft tissue and underlying bone of left fronto-parieto-temporalregion (Figure2)

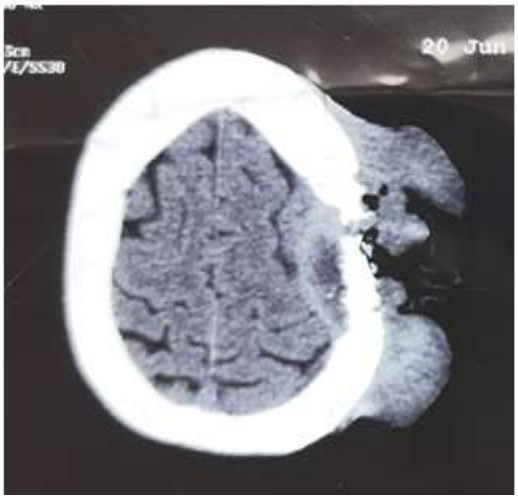

FIGURE 2: NCCT HEAD showing gross destruction of bone

MRI suggestive of Ulcero-proliferative growth showing heterogeneous post contrast enhancement measuring 11 x 3 cm(AP x TR) is noted along left fronto-parieto-temporal scalp causing erosion of underlying parietal bone and extension into the extradural space with enhancement of dura along left cerebral convexity causing mass effect in the form of effacement of sulco-cisternal spaces of left parietal and frontal lobe. No obvious extension into intra-dural space or brain parenchyma noted noted.(Figure 3)

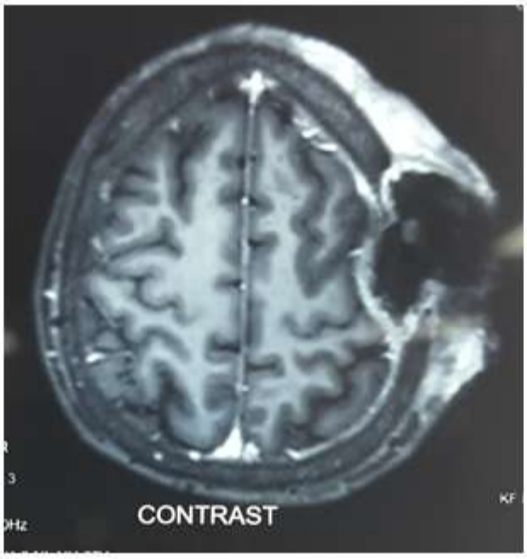

FIGURE 3: MRI BRAIN

Three-dimensional computed tomography reconstruction shows extensive destruction of the cranial bones. (Figure 4)

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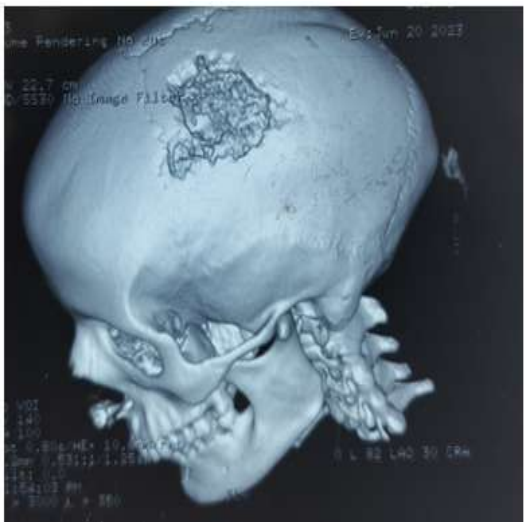

FIGURE 4: 3D Reconstruction of head.

Despite the invasiveness of the tumour, the patient felt no pain during everyday life; however, she experienced pain during dressing changes. The initial diagnosis of well differentiated SCC had been made 1 month previously with biopsy of the ulcer. The SCC was then treated surgically with wide local excision of ulcero-proliferative growth with 2.5cm margin with removal of destructive left temporo-parietal bone (Figure 5A) with transpositional flap with split thickness graft. No extension of tumour cells to dura mater was noted. The dura mater was additionally cauterised to avoid CSF leak and meningititis.The defect, however was still large enough to be covered by flap rotation, therefore burr holes (Figure 5B) were created piercing only the outer table of the cortex for granulation tissue regeneration for further grafting to be done in later stages. The excised ulcer with necrotic bony chips were sent for histopathological examination.

FIGURE 5A: Wide local excision with removal of destructive left parieto-temoporal bone with cauterized Dura mater.

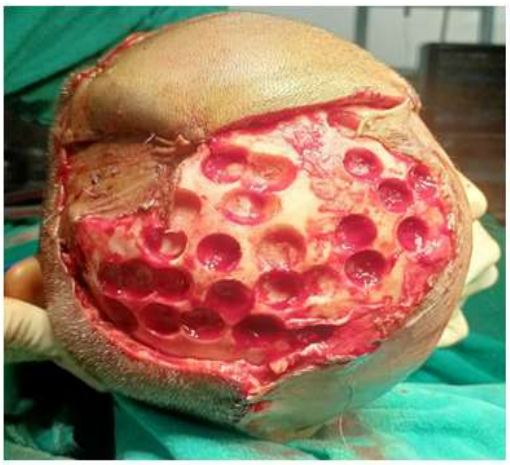

FIGURE 5B: Flap rotation with Split skin grafting with burr on the outer table of cortex

HISTOPATHOLOGY:

The excised ulcer with necrotic bony chips were sent for histopathological examination.Sections studied show tumour tissue exhibiting features of moderately differentiated squamous cell carcinoma. Few keratin pearls were noted. Surrounding stroma is desmoplastic and show moderate chronic lymphoplasmacytic inflammatory infiltrate. Areas of necrosis was also noted. Bony bits show area of necrosis, mixed inflammation and foreign body type of giant cell reaction.

The management and type of dressing were determined by plastic surgery unit who specializes in wound care. The patient received palliative care by the plastic surgery unit for wound healing and daily dressing changes with normal saline and placentrix were used to control exudate and infection. The dressings were covered with gauze and a bandage. Targeted systemic antibiotics were administered to control the secondary infection. Over the course of time, the patient had no sign of infection with no episodes of fever, all of which were successfully managed with prophylactic systemic antibiotic therapies. The patient was then discharged and was advised for daily dressing at wound healing clinic and planned for subsequent flap rotation with grafting and wound coverage by plastic surgery unit.

III.DISCUSSION

Rarely does squamous cell carcinoma begin with a dramatic and quick progression. A poor prognosis is correlated with immunosuppression, location, recurrence, histology, and late diagnosis [14]. SCC and other cutaneous cancers seldom extend to the calvarial bones and dura, but when they do, the results can

be disastrous. Few research have centred on cases of advanced scalp cutaneous cancers that have invaded the bones, meninges, and brain, to the authors' knowledge. In those studies, palliative care and surgery were both used to treat neoplastic ulcers[19]. Palliative care is the local strategy for treating neoplastic wounds, and it is essential for patients' quality of life.The local technique used in this instance was based on the TIME (tissue, inflammation/infection, moisture imbalance, and epithelial edge advancement) concept [20] [21]with particular focus on the most important characteristics of neoplastic wounds, such as pain, exudate, bleeding, and transpositional flap. In the initial phase of post operative treatment, the dressings were changed with normal saline and placentrix every 2 days; however, this did not adequately contain the exudate, so daily changes were prescribed. The patient has no signs of infection with no episodes of fever, of all very successfully managed with prophylactic systemic antibiotic therapy. The patient is subsequently planned for flap rotations and coverage by plastic surgery unit.

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