SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Surgery

Epidemiological Aspect and Management of Loss of Substance from the Scalp according to the Experience of the Plastic Surgery Department of Marrakech Morocco about 24 Cases

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DOI: https://doi.org/10.36347/sasjm.2025.v11i05.007 | **Received:** 18.03.2025 | **Accepted:** 25.04.2025 | **Published:** 08.05.2025

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Abstract **Original Research Article**

Scalp defects pose significant reconstructive challenges due to their complex anatomy and functional implications. This retrospective study analyzes 24 cases managed at our institution over 16 months (January 2020–April 2021), focusing on etiology, surgical techniques, and outcomes. Malignant tumors (83%)—primarily squamous cell carcinoma (n=12), basal cell carcinoma (n=4), and melanoma (n=3)—were the leading cause, with a male predominance (sex ratio 9.5) and mean age of 60.3 years. Defects averaged 9 cm, most commonly parietal (75%). Reconstruction employed local flaps (n=16), skin grafts (n=11), or direct suture (n=2), with cranial flaps required in 9 cases. Delayed presentation (mean 14 months) and traditional pre-treatment (20% of cases) correlated with poorer outcomes. Local flaps, particularly rotation flaps based on temporal/occipital arteries, provided optimal results due to their vascular reliability and single-stage execution. No distant flaps were utilized. Our findings underscore the need for early intervention and highlight the efficacy of locoregional flaps in resource-limited settings.

Keywords: scalp reconstruction, malignant scalp tumors, local flaps, skin grafts, squamous cell carcinoma, trauma, burns.

INTRODUCTION

Scalp defects may be created by the resection of tumors or congenital abnormalities, traumaticavulsions or burns, or osteomyelitis or osteoradionecrosis. Tissue involvement in these defects ranges from involvement of skin superficial to the pericranium to full-thickness scalp loss to combined soft tissue, calvarial, and dural involvement. When bone is exposed, coverage of it is the first reconstructive priority. Additional goals may include restoration of hair-bearing tissue and symmetry of scalp contour. The objective of our work is to report the experience of our department concerning the management of this type of lesion by analyzing the circumstances of their occurrence and their etiologies.

PATIENTS AND METHODS

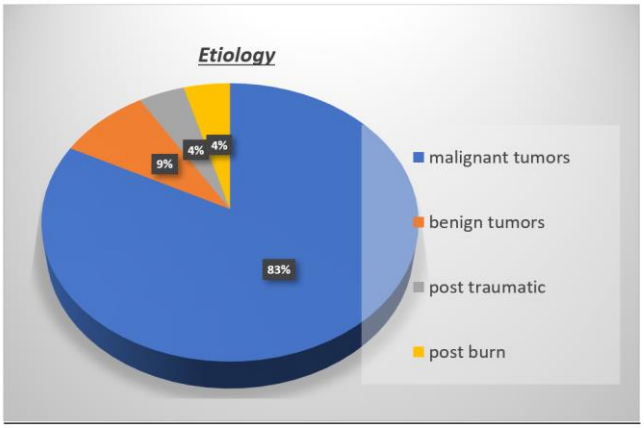
Our study is a retrospective, descriptive and analytical study, carried out over a period of 16 months (January 01, 2020 to April 01, 2021), carried out at the plastic surgery department of MARRAKECH. We had collected 32 patients.

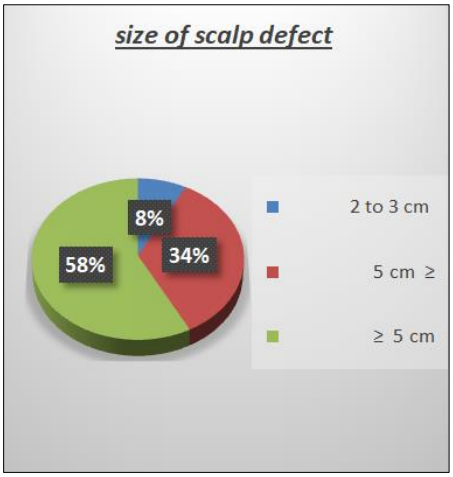
Data collection has been made from hospitalization records of patients in the department of plastic and reconstructive surgery. The reconstruction of the scalp defect was either immediate in case of healthy histopathology limits, or carried out secondarily after recovery in case of tumor limits, all defect of scalp between.

RESULTS

Epidemiology and Anatomopathology

Our study included 32 cases of whose predominant etiology was represented by malignant scalp tumors 83% (squamous cell carcinoma (n = 12), basal cell carcinoma (n = 4), melanoma (3)), 8% benign tumors, 4% post traumatic and 4% post burn.



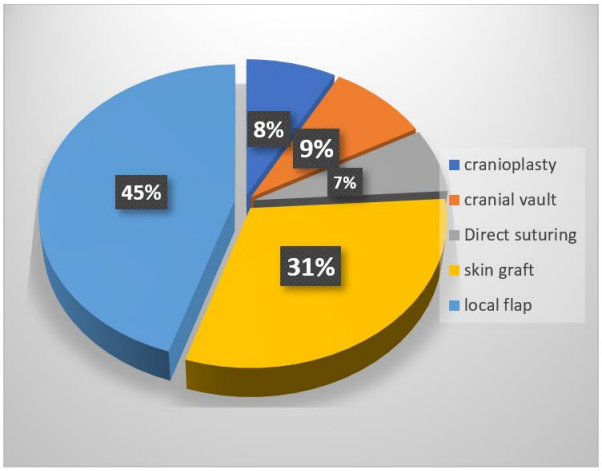


The sex ratio was 9.5 with a clear male predominance, and the average age was 60.3 years (3 years - 89 years).

The average consultation time was 14 months for malignant tumors with extremes btw 21 days and 5 years. In 20% of cases, traditional treatment was the first resort. The average size of the scalp defect observed in our series was 9cm, and who basically sat on the scalp parietal in 75%. The lesion was unique in the majority of cases

Treatment

The management required the realization of a cranial flap in 9 cases and the covering was carried out by scalp flap in 16 cases and by a skin graft in 11 cases and 2 cases direct suture, the evolution was marked by the occurrence of recurrence. The delay in taking charge which would be due to socio-cultural habits and to under-medicalization, could explain the high mortality. Traditional treatment was the first resort 20%.



Coverage was based on the location of the PDS, its size, its complexity; its depth and extent in relation to the remaining scalp as well as the quantity and quality of the remaining hair;

Count to shreds; it was locoregional shreds; in particular rotation flaps focused on the temporal and occipital artery making it possible to provide hairy skin with a subcutaneous and aponeurotic cell tissue of good quality and richly vascularized. These shreds have many advantages; first the realization in a single operative step; low morbidity and satisfactory outcome No remote flap coverage was performed in our series.

Spinocellular carcinoma of the parietal scalp Excision of the tumor Defect coverage by a skin graft

Sscalp defect, sking grafting

DISCUSSION

The scalp represents a characterized anatomical entity by its rich vascularity, its relative thickness and its low elasticity.

For most studies malignats tumors was the most incriminated, Spinocellular carcinoma tumor in the series of Fon *et al*., [28], and ours, unlike results of Katz *et al*., Chyi-yih Lin *et al*., [27], and those of P.F.Soma *et al*., where basal cell carcinoma was the leader.

For scalp melanoma, the series of "Minor and Panje" from Illinois, demonstrated that the melanoma was the 3rd variety of malignant tumors of the scalp. Only 2% of this histological variety was found in the series of Chyi-yih Lin *et al*., [27], ISSN: 2320-5407 Int. J. Adv. Res. 9(05), 1171-1177 1173 three cases in our series and no case in that of Fong and al [28].

In our series, the most common location of tumors is located at the parietal scalp, which agrees with the results of B. Kruse-Losler *et al*., [29].

Tumor excision was complete in depth and periphery in 93.5 % of tumoral cases. The margin of excision was between 1 and 3 cm. Radiotherapy was indicated in 12 cases. None of our patients received chemotherapy courses. The size of the defect varied between 2 cm and 15 cm.

We have a panoply means to cover the defect generated by different etiology, this in function of a certain number of parameters, namely: the size of the loss of substance, its location, its complexity, depth, breadth compared to remaining scalp then the quantity and quality of the remaining hair.

The goals of reconstruction in patients after craniofacial resection for cancer are [25], to obtain a healed wound with reliable dural coverage [26], to maintain function, particularly oral continence and

speech with anterior defects; and [23], to optimize physical appearance. Initial reports of reconstruction following these resections primarily utilized scalp flaps and split thickness skin grafts combined with subsequent placement of a prosthesis in an effort to achieve these goals [25, 26].

Secondary intention although it is infrequently employed, healing by secondary intention can be effective in the scalp. The cranium provides a stable bony platform that allows healing by secondary intention to proceed favorably, without significant distortion of local anatomy. Additionally, in certain areas (such as the forehead), the inevitable process of wound contraction becomes an advantage as the size of the defect contracts with time. In certain cases, the results may be esthetically favorable to that of local flaps [2, 3], it has been used in 45% cases.

Skin grafting has the advantage of being simple and very reliable when the basement is good, but the transplanted area is alopecic and sometimes the grafted skin has tendency to ulcerate at the slightest trauma [7].

Due to the simplicity of this technique and the problem of operability of our elderly patients, it has been used in 31 % cases.

Local flaps always represent the best therapeutic solution that you should know how to prioritize over other more invasive techniques [8].

In this series, patients with large defects of the combined anterior and temporal areas had a high incidence of wound complications requiring secondary surgery.

The majority of these defects were closed with local tissue (scalp flap and split thickness skin graft)

Tissue Expansion

Neumann first described tissue expansion to reconstruct an ear in 1957 [15]. In the last two decades, it has become an increasingly popular modality for scalp reconstruction [18–20]. It has been particularly useful in the reconstruction of defects following resection of low-grade scalp carcinoma, in the surgical management of alopecia, and in the closure of large segmental nevi. Its principle advantage lies in the ability to transfer hair-bearing skin into an adjacent area., patients must be willing to endure the increased cosmetic deformity. The process of tissue expansion results in physiologic and morphologic changes in the scalp with an increased surface area and increased mitotic activity [16]. Notably, the expansion process is a strong stimulus for vascular proliferation. Expanded flaps typically have an enhanced blood supply with increased durability. Because the number of hair follicles remains constant, there is a decrease in hair density after expansion. Depending on the preexpansion hair density of the flap, this decrease may be imperceptible. The expander is placed in a subgaleal pocket just adjacent to the defect and superficial to the pericranium. It is then expanded for 6 to 10 weeks before the planned reconstruction. The scalp flap should be expanded to 2 to 2.5 times the size of the defect.

Free tissue transfer it may be indicated by the size of the defect, the depth of tissue loss, the quality of the surrounding tissue, or the desired cosmetic result. It is an excellent option for reconstruction after ablative surgery in patients who have undergone radiotherapy and in patients in need of revision after wound breakdown or infection [7–22]. A Staging system has been devised that recommends free flap reconstruction for defects exposing bone greater than 200 cm2 on the scalp [19]. Free tissue transfer is an excellent option for complex composite wounds with exposed dura and for wound beds with alloplastic plating. Whereas no patient closed with microvascular free tissue transfer.

Although one of the local flaps used to close a large combined defect necrosed, these data suggest that methods of reconstruction other than local tissue transfer should be strongly considered for these defects.

Other investigators have also advocated this approach [23, 24].

CONCLUSION

Scalp tumor pathology remains the most common cause of scalp defect, the treatment is essentially surgical with the widest possible resection and immediate or deferred coverage depending on the diversification of means of repair must respond to satisfactory reconstruction; must be reliable, and allow an adjuvant treatment knowing that the simplest means can give good results. Thus the partial loss of substances from the scalp does not pose a problem of coverage because the remaining scalp can be mobilized in full and axialized on a single pedicle (temporal artery or the occipital artery) if the bone is exposed, otherwise and when the basement allows it, a simple skin graft provides coverage.

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