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Case Report

Chronic Scalp Ulcer 35 Years after Skull Trepanation Surgery and Radiotherapy for Oligodendroglioma: A Further Example of Immunocompromised Cutaneous Districts

Uwe Wollina[1*], Andreas Nowak[2], Georgi Tchernev[3,4], Torello Lotti[5]

[1]Städtisches Klinikum Dresden, Dresden, Sachsen, Germany; Academic Teaching Hospital Dresden-Friedrichstadt, Germany; [2]Department of Anesthesiology & Intensive Care Medicine, Emergency Medicine & Pain Management, Dresden, Germany; [3]Medical Institute of Ministry of Interior (MVR), Department of Dermatology, Venereology and Dermatologic Surgery, Sofia, Bulgaria; [4]Onkoderma - Policlinic for Dermatology and Dermatologic Surgery, Sofia, Bulgaria; [5]Università Degli Studi "G. Marconi", Rome, Italy, Facoltà di Medicina e Chirurgia - Chair of Dermatology, University of Rome, Rome, Italy

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Keywords: Chronic scalp ulcer; Oligodendroglioma; Second malignancy; Complex reconstruction; Immunocompromised cutaneous district

***Correspondence:** Uwe Wollina. Städtisches Klinikum Dresden, Dresden, Sachsen, Germany. E-mail: wollina-uw@khdf.de

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Abstract

BACKGROUND: Chronic ulcers of the scalp have a variety of underlying pathologies. In case of cancer patients, a second malignancy must be excluded.

CASE REPORT: A 78-year-old female patient presented to our department with a large soft tissue defect on the frontotemporal left side. The lesion was about 3 cm in diameter with exposed bone and inflammatory soft tissue on the edges of the defect. About 35 years ago, she had undergone a combined neurosurgery with skull trepanation and radiotherapy for an oligodendroglioma. Three years ago, sandwich transplantation with the dermal template and meshed skin graft failed. Now she re-presented with inflammatory ulcer borders. A complex defect repair was performed after exclusion of a second malignancy.

CONCLUSION: Chronic scalp ulcers may be the result immunocompromised cutaneous districts and need a complex reconstruction.

Introduction

Chronic scalp ulcers have a variety of differential diagnoses – vascular, infectious, developmental etc. In cancer patients, second malignancies are not uncommon. Focusing on the skin, chronic scars and chronic radiodermatitis are prone to non-melanoma skin cancer development [1]. Radiotherapy is a risk factor for cutaneous angiosarcoma [2, 3].

Radiotherapy has also possible adverse effects on vascularity of tissues with subsequent tissue fibrosis and/ or ulceration [4].

Here we present a case of an elderly female patient with the development of a chronic scalp ulcers suggesting second non-melanoma skin cancer after primary treatment of oligodendroglioma. We also discuss the defect closure.

Case report

A 78-year-old female patient presented to our department with a large soft tissue defect on the frontotemporal left side (Fig. 1a). The lesion was about 3 cm in diameter with exposed bone and inflammatory soft tissue on the edges of the defect. The inflammatory changes developed only recently and have been the reason for the consultation.

About 35 years ago, she had undergone a neurosurgery with skull trepanation for an oligodendroglioma.

Three years ago an excision of fibrous tissue suggestive of squamous cell carcinoma was performed with a defect closure by meshed graft on a dermal template, also known as sandwich transplantation. Histology excluded a malignancy but demonstrated a chronic nonspecific inflammatory reaction with calcinosis cutis. The transplant, however, was lost.

Her medical history was remarkable for hemiparesis, aphasia and epilepsy, repeated urosepsis, suprapubic cystostoma and cholecystectomy.

On examination, we observed an exposed bone frontotemporal with inflammatory and necrotic changes of the surrounding soft tissue. We decided to remove the altered soft tissue and bony surface and defect closure by the rotational flap.

Surgery was performed under general anaesthesia. The soft tissue was removed with a safety margin of 1 cm. The bony surface was refreshed by a rose head burr driven by a pneumatic power drill. The outer table of the skull was completely milled exposing diploic veins to obtain better vascular supply. A one mm thick dermal template made of collagen and elastin was fit in and reconstituted with Ringer's solution. The defect was closed by a large rotational flap after extensive mobilization of the soft tissue from underlying bone. The defect was sutured by a braided, surgical suture composed of polyethylene terephthalate (Ethibond®, Ethilon) (Fig. 1 b, c).

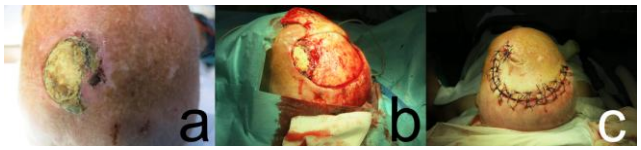

Figure 1: Chronic scalp ulcer 35 years after surgery and radiotherapy of oligodendroglioma. (a) Initial clinical presentation of necrotic exposed bone and soft tissue alterations suggestive of a second malignancy; (b) Surgical situs after removal of altered soft tissue und necrotic bone with exposure to diploic veins; (c) After complete closure by rotational flap on dermal template

Histology of soft tissue revealed a chronic granulomatous inflammatory reaction with comedo-like structures and epithelial cysts. No cytological atypia and no malignancy at all.

Discussion

Oligodendrogliomas belong to the World Health Organization grade II slow growing central nervous (CNS) tumours. The present patient had a treatment for oligodendroglioma 35 years ago. In that time, surgery and radiotherapy were the cornerstones of treatment. Upfront surgical maximal safe resection has been shown to improve overall and progression-free survival [5, 6].

Surgery and radiotherapy may have a long-term impact on surrounding tissues, which may create a certain vulnerability of that part of the anatomy. Several types of bone pathology in the setting of radiotherapy are known, such as advanced osteoradionecrosis, pathologic fractures and non-unions. In the case of CNS targeted radiotherapy decreased vascularity of irradiated skull may cause impairment of overlying soft tissue structures [7, 8].

The sectorial impairment of immune and other functions of skin has been described by Ruocco using the term "immunocompromised cutaneous districts" (ICD)[9-11].

We suggest that iatrogenic ICD has caused the delayed chronic soft tissue defect in our case. In such a situation, minor impairment of microcirculation can cause catastrophic sequelae leading to chronic ulceration. This would explain why the first attempt to cover the defect in 2012 by sandwich transplantation [12] failed.

Scalp ulcerations often need a complex approach for closure with consideration of bony structures and soft tissue [13]. We used the rose head burr driven by a pneumatic power drill to remove necrotic bone and to expose diploic veins in the cancellous skull [14]. A collagen-elastin dermal template was fit in and a large rotational flap was prepared to cover the defect.

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