

## PDT in the treatment of inconveniently located skin tumours of the head: A case of basal cell carcinoma of the eyelid in a patient with Gorlin Goltz Syndrome

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### ABSTRACT

Approximately 5% to 10% of all skin cancers occur in the eyelid; basal cell carcinoma (BCC) is the most frequent (90%). A 38-year-old man, affected by Gorlin-Goltz syndrome, presented with a BCC in the left lateral canthus area. Photodynamic therapy (PDT) with methyl-aminolaevulinate (MAL) after Frost suture was performed without anaesthesia. Very good results were obtained with rapid healing and without side effects. There was no evidence of scar formation and no signs of recurrence at 5 years follow-up. Many therapeutic methods have been suggested for basal cell carcinoma of the eyelids. We consider photodynamic treatment of eyelid skin malignancies to be of great interest; it represents an interesting new procedure for their management especially when surgical intervention is not tolerated, and for patients with many lesions as in Gorlin Goltz Syndrome.

**KEYWORDS:** methyl-aminolevulinate, photodynamic therapy, periocular malignancies, skin

tumors, eyelid basal cell carcinoma, Frost suture, Gorlin Goltz Syndrome

### INTRODUCTION

In many cases, skin cancer occurs on the face with the site of tumors (including nose, periorbital area, ear...) often "inconvenient" for surgical excision, cryotherapy, electrosurgery and radiotherapy, as these procedures would result in the destruction or significant mutilation of delicate tissue and thus have functional and aesthetic consequences. Malignant tumors in adults often occur in periocular tissue due to external aggression (exposure to ultraviolet light, chemicals, ionizing radiation), immunosuppression and genetic skin disorders [1]. Approximately 5-10% of all skin tumors involve the eyelids [2]. The types of malignancies include basal cell carcinoma (BCC), squamous cell carcinoma (SCC), sebaceous carcinoma and malignant melanoma. BCC is by far the most frequent malignant eyelid tumor (90%) followed by SCC (9%) [3], and its incidence continues to rise approximately up to 10% annually worldwide [4, 5]. Although its growth rate is slow and distant metastases are exceedingly rare, BCC can lead to major complications in the periocular region as a result of orbital invasion.

Surgical excision with tumor clearance confirmation by margin examination and primary repair is the reliable and effective, first choice treatment option for periocular BCC. Radical excision is

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important because recurrences are more aggressive, infiltrative, and destructive, and have a less favorable prognosis than primary tumors. Nonetheless, the goal of modern medicine remains to develop therapies that selectively target diseased cells while sparing normal tissue, thus preserving function and cosmetic appearance as much as possible. Among techniques alternative to classic surgery, Mohs micrographic surgery is certainly effective, yet time consuming, expensive, and not widely available. Electrodesiccation and curettage, radiotherapy, cryotherapy, laser ablation, and immunotherapy have all been described in the literature as alternative treatments for BCC in patients who are not good candidates for surgery [2, 4, 5]. Photodynamic therapy (PDT) using a photosensitizing agent, a visible light source, and oxygen to induce selective tumor cell destruction while leaving healthy tissue unharmed, is a non-invasive alternative treatment for eyelid BCC [6-17].

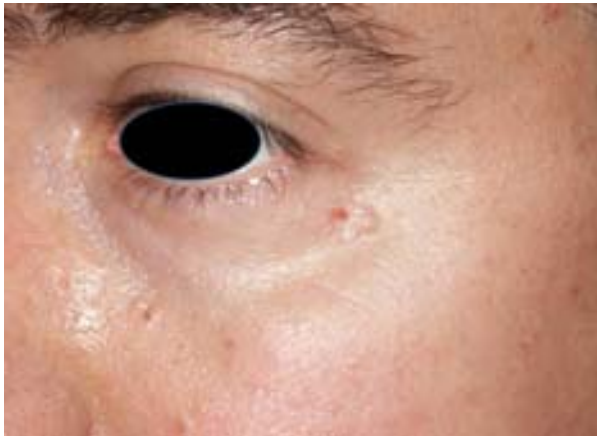
## CASE REPORT

We report the case of a 38 year-old man, affected by Gorlin-Goltz syndrome [12-14], who presented with a nodular lesion localized in the left lateral canthus, 3 mm below the eyelid margin (Fig. 1). According to the patient's history, the lesion had appeared approximately 6 months earlier. The physical examination of the surrounding soft tissues and regional lymph nodes was negative. The histologic examination of an incisional (punch) biopsy confirmed the diagnosis of BCC. In order to preserve the function and aesthetic appearance of the area, we decided to treat the patient with PDT with methylaminolaevulinate (MAL), after proper preparation of the area to be treated. We chose the Frost suture (Fig. 2), considered a kind of eyeball protection safer and more useful than others (metal eye shields, special contact lenses, metal selective screens for the eyeball). The suture engages the eyelid margin with a 3/0 silk, and it is secured to the forehead skin with a steristrip. By stretching the lower eyelid upwards, the eyeball is fully protected by the lower eyelid itself. The advantages of using the eyelid itself in protecting the cornea are easily understood since no synthetic material is so well tolerated. Furthermore, as eyelid skin carcinomas

are usually located in the lower eyelids, this suture has the added advantage of stretching the area to be treated and immobilizing it. The suture is well tolerated for 24-48 hours thus allowing the absorption of the photosensitizer and preventing its contact with the eye. Our patient was treated with photodynamic therapy using MAL (methyl-aminolaevulinic acid cream, Metvix<sup>®</sup>, PhotoCure ASA, Oslo, Norway) under occlusion, to enhance tissue penetration, for 3 hours: a thick layer (about 1 mm) of 160 mg/g MAL cream was applied on the lesion and 5 mm on the surrounding tissue, then covered by an occlusive dressing (tegaderm<sup>®</sup>, 3M Health Care, St. Paul, MN, USA), and covered again by a gauze to avoid photo-exposure and prevent accidental activation of the cream (photo-bleaching). Before administration of the cream, the surface of the lesion was scraped to remove scales and crusts, to facilitate the penetration of the active agent. The dressing was then gently removed and the cream washed off with saline solution. The eye was protected by using a temporary suspension Frost suture. An irradiation by a red light-emitting diode lamp (Aktilite PDT-model CL128<sup>®</sup>, PhotoCure, Oslo, Norway) was employed for 8 minutes and 40 seconds, with a wavelength of 632 nm, a light dose of 37 J/cm<sup>2</sup> and a light intensity of 70-100 mW/cm<sup>2</sup>. The PDT treatment, comprising 2 sessions with a 1-week interval, was performed without local anesthesia. Our patient was advised of the risk of recurrence or new tumors and encouraged to attend regular follow-up examinations. Good cosmetic results were obtained after only one ALA-PDT session and the decision to retreat the patient was made on the basis of the clinical response of the tumor through the evaluation of its reduction in size. No recurrence was observed at 5 years follow-up (Fig. 3).

## DISCUSSION

The mid-face area, including the eyelids, is considered difficult to treat and includes a higher risk of recurrences. This is especially true for BCC, the most frequent cancer of the eyelids. In this area, functional and cosmetic aspects are of great importance in addition to the primary goal, i.e. tumor eradication. Gorlin-Goltz Syndrome is a rare autosomal-dominant disorder characterized



**Fig. 1.** Basal cell carcinoma localized in the middle third of the inferior eyelid, 3 mm under the eyelid margin.



**Fig. 2.** The Frost suture.



**Fig. 3.** Clinical result at 5 years follow-up.

by a wide range of different lesions: multiple BCCs, odontogenic keratocysts, and skeletal abnormalities. A problem for these patients' therapy is the number of BCCs which can develop in their skin, making the choice of the most effective approach for the dermatologist difficult [12-14]. Although surgery is considered the optimal treatment of eyelid BCC, PDT is an alternative treatment that can be useful in selected patients with difficult-to-treat BCC in the periocular region, such as those affected by Gorlin-Goltz Syndrome [15-19], superficial lesions where complicated surgery might lead to disfigurement, or in patients in poor general health who refuse a surgical procedure. We want to point out that traditional surgical techniques involve the full thickness excision of 4 mm of healthy tissue with significant mutilation of delicate eyelid tissue, and thus in functional and aesthetic consequences. PDT is also a valid alternative to Mohs micrographic surgery, which saves tissue but is extremely lengthy and only performed in a limited number of specialized clinics. PDT yields not only a high percentage of good therapeutic results, but also excellent cosmetic outcome. It is also for this reason that we consider this treatment of eyelid skin malignancies to be of great interest and it may represent an interesting new procedure for their management especially when surgical intervention is not tolerated, as in this case. In conclusion, our case and literature data [15-20] suggest that PDT, with its negligible side effects, limited to a few days and no cosmetic and functional disfiguring, is an effective and well-tolerated treatment of BCC of the eyelid in selected patients.

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