Photodynamic therapy as adjunctive therapy for morpheaform basal cell carcinoma

T. Torres, I. Fernandes, V. Costa, M. Selores

KEY WORDS

photodynamic therapy, morpheaform basal cell carcinoma, adjunctive therapy

SUMMARY

The authors decided to evaluate the possible use of methyl-aminolevulinate photodynamic therapy (MAL-PDT) as adjunctive therapy for morpheaform basal cell carcinoma prior to standard surgical excision in order to reduce tumor size and volume and to facilitate surgical treatment. It was observed that MAL-PDT may be an option as an adjunctive therapy prior to standard surgical excision of morpheaform basal cell carcinoma, leading to less invasive surgery.

Topical photodynamic therapy has demonstrated high efficacy in the treatment of nonmelanoma skin cancers such as actinic keratoses, Bowen's disease, and basal cell carcinoma (superficial and nodular). Because of its excellent cosmetic results it has also been used with good results in "difficult-to-treat" basal cell carcinomas (large lesions, multifocal, or mid-facially localized), lesions that would otherwise require extensive surgical procedures (1). Morpheaform basal cell carcinoma is a rare variant in which tumor cells induce a proliferation of fibroblasts within the dermis and an increased collagen deposition that clinically resembles a scar. Because the tumor infiltrates in thin strands between collagen fibers, treatment is difficult, and the clinical margins are difficult to distinguish. Surgery, particularly Mohs surgery, is the treatment of choice for this type of basal cell carcinoma.

The authors decided to evaluate the possible use of methyl-aminolevulinate photodynamic therapy (MAL-PDT) as an adjunctive therapy for morpheaform basal cell carcinoma prior to standard surgical excision (Mohs surgery is not available at our center) in order to reduce tumor size and volume and facilitate surgical treatment. Therefore, the aim was to assess if this approach could lead to less invasive surgery, which can be particularly relevant in the excision of basal cell carcinomas on the face.

Six histologically confirmed morpheaform basal cell carcinomas were carefully selected (Fig. 1). Three tumors were located on the face and three on the back. The lesion dimensions (clinical dimensions) and location are shown in Table 1. Two treatments with MAL-PDT, 1 week apart, were performed: an application of approximately 1 mm thick of 160 mg/g MAL cream (Metvix®, Galderma, France) was applied on the lesion and 5 to 10 mm of surrounding skin. The lesion was then covered by an adhesive, occlusive dressing for 3 hours, after which time the cream was removed by rinsing with saline solution. The lesion was immediately illuminated with an LED light

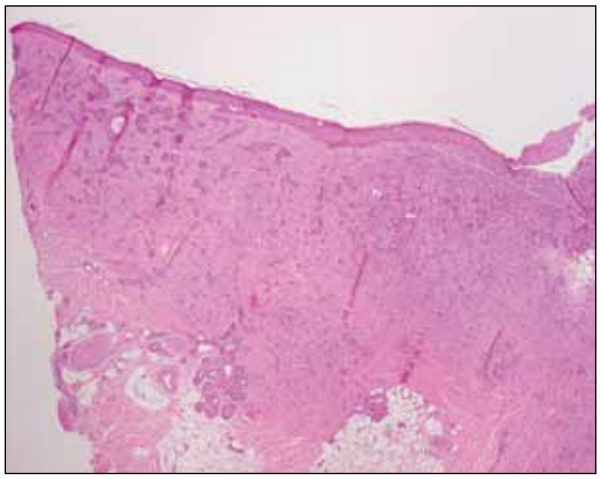

Figure 1. Histopathological examination (H&E, 4×).

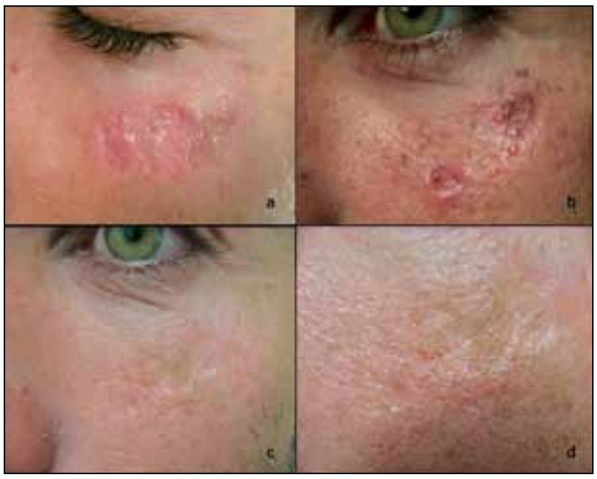

Figure 2. Clinical features of the lesion before treatment (a); 3 weeks after two treatments with MAL-PDT 1 week apart (b); 18-month follow-up after PDT and surgical excision (c and d).

source (Aktilite® CL16 & CL128 lamps, PhotoCure ASA, Norway) which emits red light at an average wavelength of approximately 630 nm at a dosage of 37 J/cm². The patients were examined to assess the clinical response 3 weeks after the two treatments with MAL-PDT and the clinical size of all the tumors was significantly reduced (30–50%). The surgical excisions performed (traditional surgery, because Mohs surgery is not available at our center) with 5 mm margins were less extensive that those that would have been necessary initially because the clinical sizes of all tumors were significantly reduced. Histopathologically, all the excision margins were tumor-free. After 2½ years, all the patients remained without any evidence of recurrence and the cosmetic outcome was considered very good (Fig. 2).

Table 1. Lesion location and clinical dimensions.

Case	Location	Clinical size
1	Face (malar)	2.7 cm × 1.6 cm
2	Face (mandibular)	2.5 cm × 1.3 cm
3	Face (cheek)	2.0 cm × 0.9 cm
4	Dorsum	3.7 cm × 2.3 cm
5	Dorsum	2.9 cm × 1.9 cm
6	Presternal	3.5 cm × 1.7 cm

Combining more than one therapeutic modality has the potential advantage of enhancing the cure rate while minimizing adverse effects and maximizing cosmetic results. The use of an adjunctive therapy prior to surgical treatment may allow a reduction in tumor volume along with the possible induction of an immune response to the tumor, facilitating excision of the cancer (2). Topical 5-fluorouracil cream or 5% imiquimod cream has been used to pretreat basal cell carcinoma prior to surgery, leading to a decrease in the eventual wound size (3, 4). Combination therapy with methyl-aminolevulinate photodynamic therapy (MAL-PDT) and imiquimod cream has also been reported in the treatment of nodular basal cell carcinoma (5).

Important limitations of this study obviously include the small number of patients and the fact that fluorescence studies were not performed following the MAL application, which could have offered additional proof of the beneficial effect of the MAL-PDT.

Although no reports can be found in the literature concerning the use of topical photodynamic therapy in the treatment of morpheaform basal cell carcinoma, and despite the small number of patients taken into consideration, this preliminary study has found that MAL-PDT may be an option as an adjunctive therapy prior to standard surgical excision of morpheaform basal cell carcinoma, especially when Mohs surgery is not available. Further studies and longer clinical follow-ups are necessary to confirm our findings.

REFERENCES

1. Vinciullo C, Elliott T, Francis D, Gebauer K, Spelman L, Nguyen R, et al. Photodynamic therapy with topical methyl aminolaevulinate for "difficult-to-treat" basal cell carcinoma. Br J Dermatol. 2005;152:765–72.
2. Ceilley RI, Del Rosso JQ. Current modalities and new advances in the treatment of basal cell carcinoma. Int J Dermatol. 2006;45:489–98.
3. Butler DF, Parekh PK, Lenis A. Imiquimod 5% cream as adjunctive therapy for primary, solitary, nodular nasal basal cell carcinomas before Mohs micrographic surgery: a randomized, double blind, vehicle-controlled study. Dermatol Surg. 2009;35:24–9.
4. Turan A, Saricaoglu H, Baskan EB, Toker SC, Tunali S. Treatment of infiltrating basal cell carcinoma with the combination of intralesional IFNalpha-2b and topical imiquimod 5% cream. Int J Dermatol. 2009;48:214–5.
5. Devirgiliis V, Panasiti V, Curzio M, Gobbi S, Rossi M, Roberti V, et al. Complete remission of nodular basal cell carcinoma after combined treatment with photodynamic therapy and imiquimod 5% cream. Dermatol Online J. 2008;14:25.

AUTHORS' ADDRESSES

Tiago Torres, MD, Department of Dermatology, Centro Hospitalar do Porto – Hospital de Santo António, Edifício das Consultas Externas do Hospital Geral Santo António, Ex. CICAP, Rua D. Manuel II, s/n, 4100 Porto, Portugal, E-mail: tiagotorres2002@hotmail.com

Iolanda Fernandes, MD, same address, E-mail: iolandacfernandes@iol.pt

Virgílio Costa, MD, same address, E-mail: madalenavsanches@gmail.com

Manuela Selores, MD, same address, E-mail: dermat@sapo.pt