

Photodynamic therapy for treatment of multiple lesions on the scalp in nevoid basal cell carcinoma syndrome - Case report

Terapia fotodinâmica para tratamento de múltiplas lesões no couro cabeludo na síndrome do nevasocelular - Relato de caso

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Abstract: Photodynamic therapy is an effective alternative for the treatment of non-melanoma skin cancer, selectively destroying the neoplastic cells through the use of photosensitizer substances that are irradiated with a source of light of adequate wave length. Nevoid Basal Cell Carcinoma Syndrome is a genodermatosis characterized by multiples basal cell carcinomas occurring at an early age, compelling patients to various surgeries, some of them disfiguring. The aim of this article is to show the excellent result of the treatment of multiple basal cell carcinomas on the scalp of a patient suffering from Nevoid Basal Cell Carcinoma Syndrome.

Keywords: Basal cell nevus syndrome; Carcinoma, basal cell; Photochemotherapy

Resumo: A terapia fotodinâmica é uma alternativa eficaz de tratamento para neoplasias cutâneas não melanoma e tem como princípio a utilização de substâncias fotossensibilizantes que, após serem irradiadas com uma fonte de luz de comprimento de onda adequado, destroem seletivamente as células neoplásicas. A Síndrome do Nevobasocelular é uma genodermatose que cursa com o desenvolvimento de inúmeros carcinomas basocelulares em uma idade precoce, submetendo os pacientes a vários procedimentos cirúrgicos, muitas vezes desfigurantes. Este artigo tem como objetivo demonstrar o excelente resultado do tratamento de carcinomas basocelulares no couro cabeludo de uma paciente com a Síndrome do Nevobasocelular.

Palavras-chave: Carcinoma basocelular; Fotoquimioterapia; Síndrome do nevo basocelular

INTRODUCTION

A variety of malignant and pre-malignant cutaneous conditions, including basal cell carcinoma (BCC), actinic keratoses (AK) and Bowen disease have been effectively treated with photodynamic therapy (FDT).^{1,2}

The 5-aminolevulinic acid (ALA) and its derivative methylamineolevulinato (MAL) are topic photosensitizers used in FDT. When employed, they are selectively absorbed by the neoplastic cells and converted into a photoactive porphyrin: the protoporphyrin IX.¹ After the illumination of the sensitized tissue with a source of light of adequate

wave length, the photoactive porphyrins are stimulated and produce great amount of energy. This energy is transferred to molecules of oxygen, resulting in the formation of reactive species of oxygen, specially of *singlet* oxygen that, for being cytotoxic, cause the destruction of the sick tissues. Protoporphyrin IX is metabolised in heme, as it becomes photodynamically inactive within 24 to 48 hours.⁴

The most common adverse effects are phototoxic reactions, described as burning sensation during the treatment and erythema, persisting for

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more than 7 days. Pigmentary alterations are rare and, when they occur, they have short duration. Other reactions are usually uncommon.⁵

The use of topical anesthetics before the irradiation should not be done once the acid pH of anesthetics can inactivate chemically the photosensitizers.⁶ In general, FDT is well tolerated and, in some cases, pain can be relieved by using oral painkillers, given an hour before the procedure. Although the surgery continues to be the gold rule for the treatment of BCC, FDT is an efficient alternative for those patients with innumerable lesions, with large lesions or when the surgical treatment will cause great esthetic damage. Another indication is for patients without clinical conditions to undergo surgical procedures. (elderly people, pacemaker, coagulation disorders).⁷

The Nevoid Basal Cell Carcinoma Syndrome. (NBCs) or Gorlin-Goltz Syndrome is a rare genodermatosis, of dominant autosomal inheritance, with variable penetrance. Mutations in the PTCHED gene have been considered as influencing its pathogenesis. It is characterized by the appearing of multiple CBC in precocious age and many stigmas of abnormal development.⁴

FDT is a therapeutic option which offers excellent or good esthetic results,¹ that is particularly important when BCC is concerned as it is a neoplasia more frequently found in relatively young patients, such as, the carriers of the Nevoid Basal Cell Syndrome.

CASE REPORT

S.R, aged 50, female, with various lesions on the scalp, reported the beginning of the condition when she was 15 years old, with innumerable surgical procedures since then.

When examining the patient we observed an erythematic ulcerated lesion, measuring 6,0 x 5,0 cm, and three minor lesions measuring, on average, 1,5 x 1,0 cm on the right temporal region and ten erythematic lesion, the colour of a pearl, of an average size of 1,0 x 1,0 cm on the left temporal region. The patient also presented palmo-plantar pits, ocular hypertelorism, polydactylism and syndactyly of the third and fourth chirodactyls. Radiological studies did not show odontogenic cysts nor intracranial calcifications. Incisional biopsies on the lesions were carried out, from which the histopathologic diagnosis revealed solid BCC infiltrating the dermis (Picture 1) confirming our clinical hypothesis of Nevoid Basal Cell Syndrome.

The patient was directed to the service of plastic surgery for therapeutic evaluation. As a consequence of the great number of lesions on the

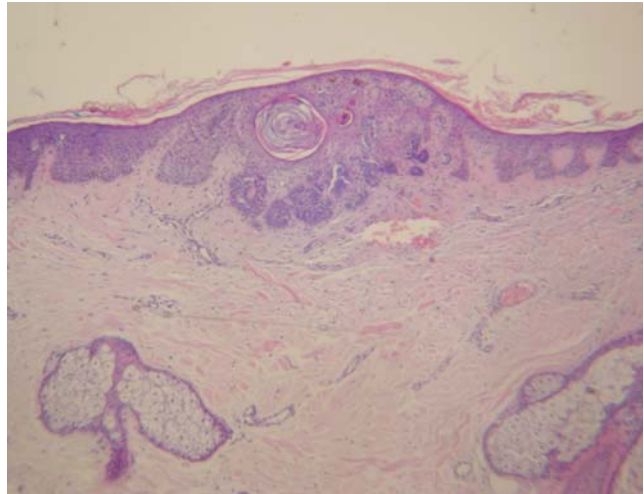


FIGURA 1: Biópsia incisional em lesão eritemato-perolada, na região temporal direita

scalp two approaches were suggested: exeresis of the lesions with healing by second intention or use of skin expanders with posterior resection of the lesions and reconstruction by primary closure. Due to the aggressiveness of these surgical procedures of high morbidity we proposed the FDT with MAL and red light of narrow band for the treatment of lesions on the scalp.

The first FDT session was carried out on 20th August, 2007. The patient was submitted to a trichotomy on the whole scalp, with curettage of the lesions. (Picture 2). Following, a layer of medication was put, with a thickness, of 1 mm and in 5 to 10 mm around the normal skin.⁸ It was used a tube for lesions on the scalp. A dressing with PVC plastic and aluminum paper was put on the lesions to avoid exposition of the medication to the light. It was given a sublingual pill of ketorolac of thrometamine 30 mg



FIGURA 2: Após curetagem

(Toragesic[®]), a non-hormonal anti-inflammatory, 30 minutes before the illumination. Three hours later we removed the MAL layer and the area was irradiated with a LED, using red light (Aktlite), with an average wave length of 670 nm and total fluency of 37J/cm² during 7 minutes and 50 seconds. The patient tolerated very well the treatment without being necessary the interruption of the treatment in any moment of the irradiation.

The patient returned to the service after one week without any complaints. Exam showed that she presented erythema and adherent crust on the scalp, without infectious signs.

On September, 10th, 2007, it was carried out a second session. With a curet the crusts were removed and the procedure of the first session was carried out in the same way.

A week later, the patient returned to the service presenting meliceris crusts in the treated areas (Picture 3). It was initiated the treatment with a topical antibiotic, mupirocin cream, 2%, twice a day during 10 days, with improvement of the condition. New biopsies to control the cure were carried out 9 months after the treatment with FDT (Picture 4) The patient remains in attendance at the service and up to now new lesions have not been identified, neither on the areas of alopecia nor on the treated areas (Picture 5).

DISCUSSION

There are various reasons for the treatment of BCC. The surgical treatment is a therapeutic option relatively secure, following a previous planning, adequated to the histopathological type, size and location of the BCC.⁹ The reconstruction using skin expanders is useful, in large or multiple lesions in areas such as: scalp and cervical region. One of the

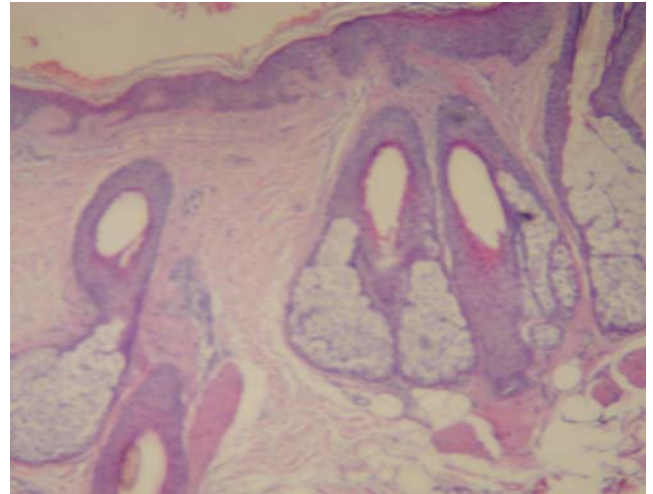


FIGURA 4: Biópsia incisional, nove meses após a terapia foto-dinâmica, na região temporal direita

disadvantages of this procedure is the performance of the treatment in two surgical events and the great physical and psychological discomfort during the expansion of the skin which is slow and gradual. In general, it is indicated the use of expanders when it is required the best esthetic result without being available any other reconstruction alternative with comparable results. The impossibility of a histopathological control and the residual hyperpigmentation are some of the disadvantages of cryotherapy. Among the disadvantages of radiotherapy we could mention: the impossibility of ensuring (through microscopic exam) the inclusion of all the lesion (within the treatment fields) and the difficulty of future execution of surgical procedures on the irradiated areas (in the face of the formation of fibrotic tissue).



FIGURA 3: Crostas melicéricas, uma semana após a segunda sessão



FIGURA 5: Não houve prejuízo da repilação nas áreas tratadas do couro cabeludo

Dijkstra *et al* showed successful treatment of basal cell carcinoma with FDT, using ALA and red light (400-450 nm) in the population he studied, including three patients with NBCS. The possibility of treating large areas in a unique procedure allows carriers of the syndrome to treat not only the clinical basocellular carcinomas but also the subclinical ones without any scars.¹⁰

The FDT showed to be the most adequate option of treatment for our patient due to the number, site and size of the lesions. The two sessions were well tolerated having as the only intercurrent a secondary bacterial infection after the second session.

Although pigmented BCC is not an indication for FDT treatment, we observed an important decrease on the tumor which allowed its removal with primary closure. The esthetic result was excellent and there was no prejudice to the regrowth of hair on the scalp, result particularly interesting, thanks to the sex of the patient (Picture 5).

The FDT is an alternative therapeutics for extensive and non melanoma malignant lesions.¹¹ Other methods such as radiotherapy, cryotherapy or traditional surgery might bring, apart from undesirable scars, cicatricial alopecia.¹² □

REFERENCES

1. Braathen LR, Szeimies RM, Basset-Seguín N, Bissonnette R, Foley P, Pariser D, et al. Guidelines on the use of photodynamic therapy for nonmelanoma skin cancer: an international consensus. International Society for Photodynamic Therapy in Dermatology, 2005. *J Am Acad Dermatol.* 2007;56:125-43.
2. Varma S, Wilson H, Kurwa HA, Gambles B, Charman C, Pearse AD, et al. Bowen's disease, solar keratoses and superficial basal cell carcinomas treated by photodynamic therapy using a large-field incoherent light source. *Br J Dermatol.* 2001;144:567-74.
3. Gandey A. Guidelines support photodynamic therapy for several nonmelanoma skin cancer. 2007;1-3. [cited 2009 Abr. 01]. Available from: <http://www.medscape.com/viewarticle/551337>
4. Itkin A, Gilchrist BA. delta-Aminolevulinic acid and blue light photodynamic therapy for treatment of multiple basal cell carcinomas in two patients with nevoid basal cell carcinoma syndrome. *Dermatol Surg.* 2004;30:1054-61.
5. Kormeili T, Yamauchi PS, Lowe NJ. Topical photodynamic therapy in clinical dermatology. *Br J Dermatol.* 2004;150:1061-9.
6. Foley P. Clinical efficacy of methyl aminolevulinic acid photodynamic therapy in basal cell carcinoma and solar keratosis. *Australas J Dermatol.* 2005;46(Suppl3):S8-10.
7. Babilas P, Karrer S, Sidoroff A, Landthaler M, Szeimies RM. Photodynamic therapy in dermatology - an update. *Photodermatol Photoimmunol Photomed.* 2005;21:142-9.
8. Siddiqui MAA, Perry CM, Scott LJ. Topical Methyl Aminolevulinic acid. *Am J Clin Dermatol* 2004;5:127-137.
9. Szeimies RM, Morton CA, Sidoroff A, Braathen LR. Photodynamic therapy for non-melanoma skin cancer. *Acta Derm Venereol.* 2005;85:483-90.
10. Gold MH, Goldman MP. 5-aminolevulinic acid photodynamic therapy: where we have and we are going. *Dermatol Surg.* 2004;30:1077-83.
11. Torezan L, Neto CF, Niwa ABM. Terapia fotodinâmica em dermatologia: princípios básicos e aplicações. *An Bras Dermatol.* 2009;84:445-59.
12. Lui H, Hobbs L, Tope WD, Lee PK, Elmetts C, Provost N, et al. Photodynamic therapy of multiple nonmelanoma skin cancers with verteporfin and red light-emitting diodes: two-year results evaluating tumor response and cosmetic outcomes. *Arch Dermatol.* 2004;140:26-32.

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