

# Management of alopecia in oncologic treatment patients

## Manejo de alopecia no paciente em tratamento oncológico

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### ABSTRACT

**Introduction:** The treatment of cancer has been evolving every day. However, adverse effects such as dermatological changes have a great psychosocial impact on cancer patients. One dermatological change is alopecia, characterized by loss of eyebrow and scalp strands. **Case report:** Two cases of patients undergoing chemotherapy with partial and total alopecia were reported. Both were treated with Minoxidil, which was topically used, with complete repilation after three months. No adverse effects observed. **Conclusion:** Minoxidil topical lotion has proven to be an effective and safe method to treat partial and total alopecia in patients still undergoing cancer treatment.

**Keywords:** alopecia; Integrative oncology; dermatology; drug therapy.

### RESUMO

**Introdução:** O tratamento do câncer vem evoluindo a cada dia. Entretanto, efeitos adversos como alterações dermatológicas apresentam um grande impacto psicossocial ao paciente oncológico. Uma dessas alterações dermatológicas é a alopecia, caracterizada pela perda dos fios da sobrancelha e do couro cabeludo. **Relato de caso:** Foram referidos dois casos de pacientes em tratamento quimioterápico com alopecia parcial e total. Ambas receberam tratamento por meio do Minoxidil, de uso tópico, havendo repilação completa após três meses. Não foram observados efeitos adversos. **Conclusão:** A loção tópica de Minoxidil mostrou-se um método efetivo e seguro para tratar a alopecia parcial e total em pacientes que ainda estão em tratamento oncológico.

**Palavras-chave:** Alopecia; oncologia integrativa; dermatologia; tratamento farmacológico.

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## INTRODUCTION

Cancer is a disease that has been growing year after year, along with the population's life expectancy. It is currently the second leading cause of death, being after cardiovascular disease<sup>1</sup>.

The emergence of new cancer treatments, complementary to chemotherapy and radiotherapy, such as targeted therapy and immunotherapy, for example, increased the expectation and quality of life of cancer patients. However, as with most conventional treatments, there are several adverse dermatological effects<sup>2,3</sup>.

Dermatological changes include capillaries, which vary between antineoplastic treatments. These changes include but are not limited to alopecia: texture changes; trichomegaly and hair depigmentation<sup>3</sup>.

Although these changes pose no risk to the cancer patient's health, there is a large psychosocial and self-esteem impact, causing anxiety and affecting health-related quality of life<sup>4</sup>.

For women with breast cancer, for example, alopecia is considered by patients to be a traumatic and stressful adverse effect and may even lead to treatment refusal. Alopecia is also reported to be a more difficult experience than radical mastectomy, for example<sup>4,5</sup>.

Thus, it is extremely important to provide cancer patients with access to dermato-cosmiatric rehabilitation in order to reduce the refusal and/or abandonment of antineoplastic treatment<sup>6</sup>.

There are currently some resources for the management and treatment of these conditions. For example, the use of scalp coolers such as caps. By reducing scalp cell metabolism, or by reducing blood perfusion (with decreased scalp chemotherapy concentration), there is less hair loss<sup>7</sup>.

Recent studies have associated the use of caps and cooling methods with the increased incidence of scalp metastases. Cooling can provide a protective environment for micrometastases<sup>8,9</sup>.

Minoxidil has been a strong ally for this purpose, as it is a active vasodilator and acts by increasing the anagen phase of hair growth, contributing to the increase of hair density. Commercially available topical formulations containing minoxidil have concentrations ranging from 2% to 5% active<sup>10</sup>.

Minoxidil is a vasodilator drug that was initially used to treat hypertension, but it was found that one of the side effects was increased body hair. Its mechanism of topical action is not yet clear, but acts by increasing the anagen phase, contributing to the increase in hair density<sup>11</sup>.

In this report, we will show the evolution of scalp repilification in one patient with total alopecia and one with partial alopecia, both treated with Minoxidil.

## CASE REPORT

### Case 1

A 61-year-old female patient was diagnosed with breast cancer in October 2016. She underwent mastectomy with

lymphadenectomy, followed by chemotherapy - doxorubicin, cyclophosphamide and taxol, and subsequently radiotherapy with 7 sessions. The patient developed total alopecia, characterized by the loss of all hair on the scalp and eyebrows.

During chemotherapy treatment, Minoxidil 5% topical solution was applied twice a day to the scalp with gentle massage by the patient after application. Although the patient had eyebrow dermopigmentation, she was also advised to use Minoxidil on them, with significant repilation.

We observed 100% scalp repilation after 3 months of Minoxidil use (Figure 1).

### Case 2

A 74-year-old female patient was diagnosed with colon cancer in 2010, when she underwent chemotherapy for 6 months. In 2016, after recurrence of the lesion, she started cetuximab, evolving with significant partial alopecia, that is, despite significant loss of hair on the scalp, partially remained on the scalp and eyebrows.

During chemotherapy treatment, Minoxidil 5% topical solution was applied twice a day to the scalp with gentle massage by the patient after application. We observed 100% scalp repilification after 3 months of Minoxidil use (Figure 2).

## DISCUSSION

Alopecia triggered by chemotherapy or targeted therapies is a common side effect that usually begins 1-3 weeks after the oncologic treatment begins, and is aggravated by subsequent cycles of this treatment. Fortunately, this condition resolves spontaneously within 3-6 months of treatment completion<sup>9</sup>.

This condition is estimated to affect 65% of patients undergoing chemotherapy or targeted therapy. A total of 47% of female patients consider hair loss the most traumatic side effect of treatment, causing 8% of them to give up chemotherapy or targeted therapy for fear of this event<sup>7</sup>.

Topical use of 2% Minoxidil has been shown to be helpful in accelerating the recovery from chemotherapy-triggered alopecia and targeted therapies in a breast cancer patient receiving adjuvant chemotherapy and a gynecological cancer patient receiving cyclophosphamide, doxorubicin and cisplatin<sup>9</sup>.

Even though Minoxidil has been used for over 30 years to stimulate hair growth in patients with androgenetic alopecia, its mechanism of action is not fully elucidated. Minoxidil is known to shorten the telogen phase and accelerate the entry of resting hair follicles into the anagen phase. In addition, Minoxidil increases hair follicle size<sup>10</sup>.

Oral use of Minoxidil causes lower blood pressure by relaxing the smooth muscle of blood vessels through the action of its sulfated metabolite - Minoxidil sulfate - which acts by opening ATP-potassium

channels. There is evidence that this is the action of Minoxidil for topical use for hair growth, but it has been difficult to demonstrate the expression of these ATP-potassium channels in the hair follicle<sup>12</sup>.

Another form of action would be its action on the dermal papilla mesenchymal cells by indirect action of Minoxidil, by vasodilation and consequent increase in blood supply and even by local irritation triggered by it<sup>13</sup>.

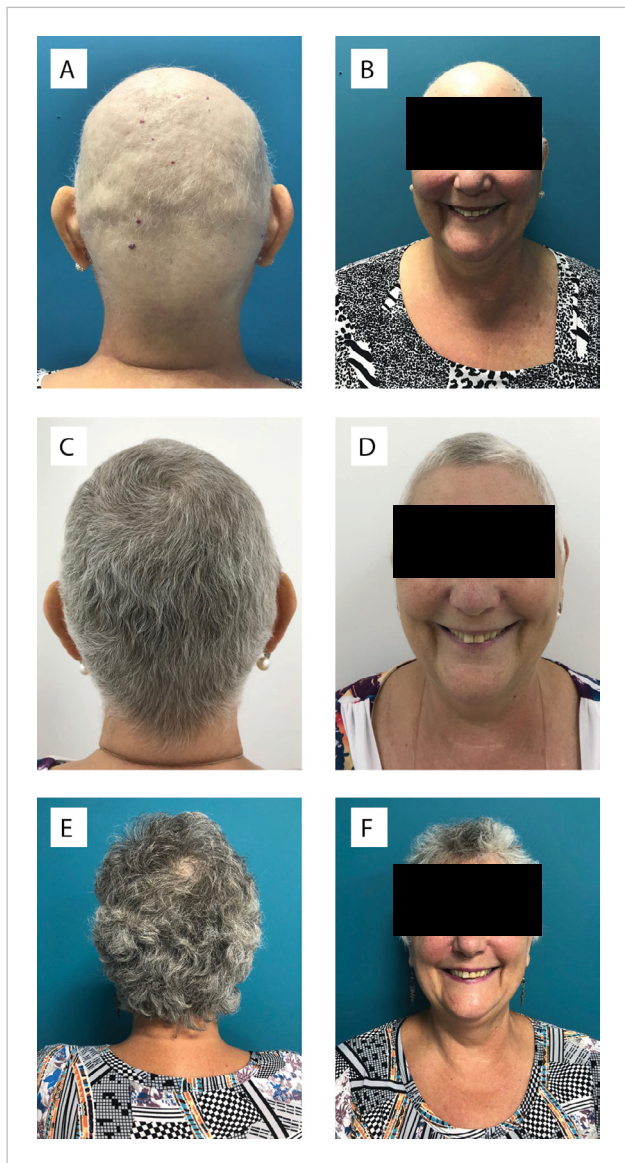
One study compared the use of Minoxidil at concentrations of 2 and 5% and showed that the group of patients who used Minoxidil at 5% showed a more statistically effective response at 48 weeks than the group who used 2%, but both helped to improve patients' psychosocial perception<sup>14</sup>.

However, there are reports that topical Minoxidil may cause local irritation and contact dermatitis-like reactions on the scalp.

This picture is often more related to propylene glycol, which is not an active ingredient but is often present in galenic formulations<sup>15</sup>.

No cases of allergy with Minoxidil were found in the literature. It was observed that the use of 2% Minoxidil lotion in patients undergoing cancer treatment promoted effective hair removal, both in cases of partial alopecia and in cases of total alopecia, in addition to thickening of the scalp and eyebrow hair and reduction of wire loss.

Thus, despite the reported side effects, promising results observed in daily practice at the Dermato-Cosmiatric Rehabilitation Outpatient Clinic of Faculdade de Medicina do ABC lead to the conclusion that the use of Minoxidil is an effective method to safely combat partial and total alopecia in patients still undergoing cancer treatment.



**Figure 1:** Patient evolution over time of use of Minoxidil. A and B: prior to the use of Minoxidil; C and D: 45 days of use of Minoxidil; E and F: 3 months of Minoxidil use.



**Figure 2:** Patient evolution over time of use of Minoxidil. A and B: prior to the use of Minoxidil; C and D: 45 days of use of Minoxidil; E and F: 3 months of Minoxidil use.

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