

## Research Letter

### Electrochemotherapy: Experience in the Management of Primary and Secondary Cutaneous Tumors in a Spanish Tertiary Referral Center



#### *Electroquimioterapia en el tratamiento de tumores cutáneos primarios y secundarios: estudio retrospectivo de 13 casos de un hospital terciario español*

To the Editor,

Electrochemotherapy (ECT) is a localized and targeted form of chemotherapy used to treat various types of primary and secondary cutaneous tumors.<sup>1,2</sup> This technique combines the administration of low-dose chemotherapeutic drugs (intravenous or intralesional bleomycin or intralesional cisplatin) with electrical pulses, which induce a transient opening of pores in the cell membrane, allowing large amounts of the chemotherapeutic agent to enter tumor cells and resulting in their destruction<sup>1–8</sup> (Fig. 1). ECT is characterized by its versatility, as it can be used in the treatment of primary cutaneous tumors and cutaneous metastases of any histological type, either alone or in combination with other therapies.<sup>2,3,5</sup> It is simple to perform, well tolerated, and highly effective.<sup>2,3,5</sup>

Since the first clinical trial in 1991,<sup>6</sup> ECT has been progressively implemented until the European Standard Operating Procedures of Electrochemotherapy (ESOPE) were published in 2006<sup>1</sup> and updated in 2018.<sup>7</sup> In recent years, this technique has become established as an additional tool in the treatment of various tumors<sup>3,4,8–10</sup> and is included in clinical practice guidelines for the management of melanoma, squamous cell carcinoma, breast cancer, Merkel cell carcinoma, basal cell carcinoma, soft tissue sarcomas, and bone metastases.<sup>3</sup> At the national level,

Ferrándiz et al. conducted a detailed review of the procedure, its indications, and clinical outcomes, contributing to the dissemination and understanding of this technique in our setting.<sup>2</sup>

We conducted a single-center retrospective observational study in which we reviewed all patients treated with ECT in the dermatology service of a tertiary referral center in Madrid, Spain from March 2022 to June 2024, with the aim of describing the clinical and evolutionary characteristics of the patients and the adverse effects of this technique.

Thirteen patients were included, whose characteristics are shown in Table 1. A complete response (CR) was observed in 2 patients, both with classic-type Kaposi sarcoma. Of note, in this series, patients with Kaposi sarcoma (3 classic-type and 1 HIV-associated) were the only ones in whom ECT was proposed as curative treatment. Eight patients showed partial response (PR): 1 with HIV-associated Kaposi sarcoma, 2 with squamous cell carcinoma (located on the nose and arm), 1 with anal squamous cell carcinoma with distant cutaneous metastases, 2 with cutaneous metastases from breast cancer, 1 with locally advanced melanoma, and 1 with Merkel cell carcinoma, which subsequently achieved CR after the use of intralesional IL-2 and cryotherapy. Two patients did not respond to treatment: 1 with classic-type Kaposi sarcoma and 1 with satellitosis of lentigo maligna melanoma. One patient with melanoma metastases died 20 days after treatment, and therefore response could not be evaluated. An overall response (OR) was observed in 77% of cases (15% CR and 62% PR). No serious adverse effects were reported; postinflammatory hyperpigmentation, erythema, crusting, and local discomfort were the most common, consistent with what has previously been reported in the literature.<sup>3</sup>

The efficacy of electrochemotherapy has been documented in multiple studies, including a large multicenter series with 987 patients and 2482 lesions, in which an OR rate of 85% was observed. The best results

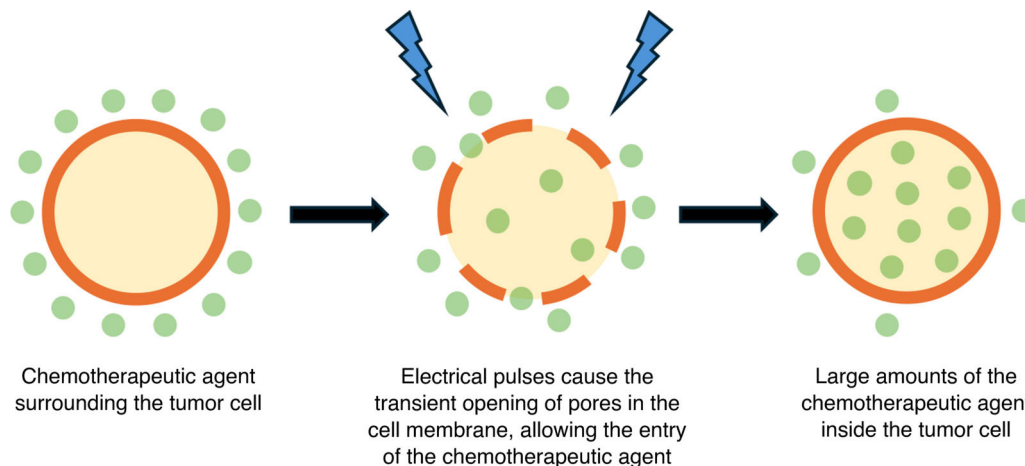


Fig. 1. Mechanism of action of electrochemotherapy: electrical pulses induce the transient opening of pores in the cell membrane, facilitating the entry of the chemotherapeutic agent into the tumor cell and causing its destruction.

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**Table 1**

Clinical characteristics, therapeutic objective, number of sessions, adverse effects, and treatment response of patients treated with electrochemotherapy.

Sex/age	Tumor type	Location	Objective	Number of sessions	Adverse effects	Response
M/59	Classic Kaposi sarcoma	Dorsum of right hand and wrist	Curative	1	Hyperpigmentation, minimal discomfort, erythema, crusts	Complete
M/77	Classic Kaposi sarcoma	Legs and feet	Curative	2	Necrotic crusts, erythema	No response
F/73	Classic Kaposi sarcoma	Right leg	Curative	1	Hyperpigmentation, local discomfort	Complete
M/61	Epidemic Kaposi sarcoma	Right leg and foot	Curative	1	Hyperpigmentation	Partial
F/88	Squamous cell carcinoma	Nose	Palliative	1	Necrotic crusts	Partial
F/97	Squamous cell carcinoma	Arm	Palliative	1	–	Partial
M/60	Lentigo maligna melanoma satellitosis	Scalp	Palliative	1	Crusts, erythema, hyperpigmentation	No response
M/74	Locally advanced melanoma	Lower limbs	Palliative	1	–	Partial
F/83	Cutaneous metastases of breast cancer	Left thorax	Palliative	1	Local discomfort	Partial
F/69	Cutaneous metastases of breast cancer	Thorax	Palliative	1	–	Partial
M/50	Cutaneous metastases of anal squamous cell carcinoma	Thigh, ankle, and penis	Palliative	1	–	Partial
F/75	Cutaneous metastases of melanoma	Trunk, left arm, posterior cervical region	Palliative	1	–	Not evaluable
M/80	Merkel cell carcinoma	Left leg	Palliative	2	–	Partial

M: male; F: female.

were obtained for Kaposi sarcoma, with CR of 91% and OR of 98%, followed by basal cell carcinoma (CR 85%, OR 96%), melanoma (CR 64%, OR 82%), squamous cell carcinoma (CR 63%, OR 80%), and breast cancer metastases (CR 62%, OR 77%).<sup>4</sup> We consider that the lower CR rate observed in our series vs the literature is due to the profile of treated patients, since most received ECT with palliative intent. These cases corresponded to large tumors in frail patients who were ineligible for surgery or radiotherapy and/or who had failed multiple prior lines of treatment. With our study we highlight the role of ECT as a valuable tool to improve these patients' quality of life, even without achieving CR, by reducing tumor size, suppuration, bleeding, and pain,<sup>1,3</sup> confirming its usefulness as a palliative option.

Regarding future perspectives, ECT has shown increasing potential to integrate with other therapies, especially immunotherapy. Recent studies highlight its capacity to enhance the immune response, acting as a platform for the release of tumor antigens and improving the efficacy of treatments such as immune checkpoint inhibitors. These combined strategies could expand the applications of ECT, strengthening its impact on both local and systemic tumor control.<sup>11</sup> Future research will be essential to optimize these synergies and consolidate its role within the multidisciplinary treatment of cancer.

In conclusion, ECT is a safe and effective therapeutic option for the treatment of cutaneous tumors, both with curative and palliative intent. Its ability to significantly improve quality of life by relieving local symptoms highlights its value in the management of patients with limited therapeutic options, such as those presented in this study.

### Conflict of interest

The authors declare that they have no conflict of interest.

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R. de Moraes-Souza  <sup>a,\*</sup>, R. Gil-Redondo <sup>a</sup>, M.I. Prieto Nieto <sup>b</sup>, P. Herranz-Pinto <sup>a</sup>

<sup>a</sup> Department of Dermatology, Hospital Universitario La Paz, Madrid, Spain

<sup>b</sup> Department of General Surgery, Hospital Universitario La Paz, Madrid, Spain

\* Corresponding author.

E-mail address: [rafa.msouza1@gmail.com](mailto:rafa.msouza1@gmail.com) (R. de Moraes-Souza).