GLOBAL SCIENCE LIBRARY

Journal of Clinical Case Reports and Reviews

CASE REPORT

Exosome Performance in the Management of Lichenoid Reactions: Case Report

Angelica Marcela Guatibonza Huerfano[1], Andrea Carolina Díaz Manrique[2]* and Tatiana Margarita María Vargas Montoya[3]

[1]*Dermatologist, Fundación Universitaria de Ciencias de la Salud (FUCS), Bogotá D.C., Colombia*

[2]*General Practitioner, Universidad El Bosque, Bogotá D.C., Colombia*

[3]*General Practitioner, Fundación Universitaria de Ciencias de la Salud (FUCS), Bogotá D.C., Colombia*

Abstract

This clinical case presents the innovative use of exosomes derived from mesenchymal stem cells in treating a lichenoid reaction induced by exfoliating agents. A 48-year-old female patient developed pigmented macules and plaques following aesthetic treatments, including nano-peels with retinoic acid and topical depigmenting agents. The clinical diagnosis was confirmed by biopsy, which revealed histological findings characteristic of a lichenoid reaction.

The therapeutic approach included topical treatment with corticosteroids and calcineurin inhibitors, as well as mesotherapy with exosomes combined with autologous serum. This strategy aimed not only to control inflammation but also to promote tissue regeneration and improve skin quality. The clinical outcome was favorable, with almost complete resolution of lesions within six months and a reduction in the impact on quality of life according to the DLQI scale (from 8 to 3 points). Furthermore, the therapy was well-tolerated, with no reported adverse effects.

This case highlights the potential of exosomes as a safe and effective alternative to conventional therapies, which often have limitations and side effects. The immunomodulatory and regenerative properties of these microvesicles address both underlying inflammation and patients' aesthetic concerns, providing a comprehensive treatment value. However, additional research is needed to establish standardized protocols to optimize their use in clinical dermatology and validate these promising results. This case suggests that exosomes could represent a new frontier in managing complex inflammatory skin conditions.

Keyword: *immunomodulatory; clinical dermatology; complex inflammatory skin conditions; mesenchymal stem cells; lichenoid; DLQI scale*

Introduction

Lichenoid reactions are a type of inflammatory dermatosis that predominantly affects the dermoepidermal junction. These conditions are characterized by immune-mediated damage to basal keratinocytes, resulting in a subepithelial inflammatory infiltrate primarily composed of cytotoxic T lymphocytes [1]. Although their incidence is low, lichenoid reactions pose a significant clinical challenge due to their heterogeneous presentation and the numerous etiologies that can trigger them, including autoimmune factors, medications, and dermatological procedures such as chemical peels. The latter, by inducing controlled exfoliation, can alter keratinocyte antigens, triggering an exaggerated inflammatory response in predisposed individuals [2].

The standard treatment for lichenoid reactions includes the use of high-potency topical corticosteroids and, in more severe cases, systemic therapies such as retinoids or immunosuppressants. However, these strategies may be insufficient in certain cases or associated with significant adverse effects, limiting their effectiveness and patient adherence. Therefore, there is an urgent need to explore therapeutic alternatives that are not only effective but also well-tolerated and capable of providing a faster resolution of symptoms [3].

In this context, exosomes derived from mesenchymal stem cells have emerged as a promising option for managing inflammatory skin conditions. These extracellular microvesicles possess immunomodulatory and regenerative properties, acting on different components of the dermal microenvironment to reduce inflammation, promote tissue regeneration, and improve skin quality. Exosomes contain anti-inflammatory cytokines, growth factors, and bioactive molecules that help modulate the host's immune response, facilitating more efficient resolution of inflammation and repair of damaged tissue [4].

The case presented here highlights the effectiveness of exosomes as an innovative therapeutic intervention in a patient with a lichenoid reaction induced by exfoliating agents. In addition to effectively addressing the inflammatory condition, this therapy provided a comprehensive improvement in skin quality, tackling both the triggering event and the initial aesthetic concern that prompted the consultation. This report contributes to the growing body of evidence on the use of exosomes in clinical dermatology and suggests that this technology could represent a new frontier in managing inflammatory and regenerative skin diseases.

Case Presentation

Patient information

A 48-year-old female patient presented to the dermatology clinic with pigmented macules and plaques on her face, which began to manifest following aesthetic treatments. The patient had no relevant medical history or known chronic conditions and had previously undergone a series of interventions to enhance her skin's appearance. The treatments included nano-peels with retinoic acid, topical depigmenting agents (kojic and phytic acid), and an oral regimen of tranexamic acid and spironolactone to address both existing pigmentation and mild hormonal acne.

Clinical findings

On initial physical examination, grayish pigmented plaques were observed in specific areas of the face, predominantly in the temporal and mandibular regions. The lesions exhibited a polygonal morphology and mild pruritus, prompting a differential diagnosis among various inflammatory dermatoses. The patient reported that the lesions negatively impacted both her aesthetic appearance and quality of life, affecting her confidence and performance in social and professional settings. This impact was assessed using the

Dermatology Life Quality Index (DLQI), where she scored 8 points, indicating a moderate effect on her daily life.

These clinical and contextual findings provided a clear picture of the patient's condition, enabling the design of an individualized therapeutic approach that addressed both the underlying inflammatory event and the original aesthetic concerns that motivated her consultation.

Diagnostic evaluation

The patient underwent a comprehensive diagnostic evaluation, including both clinical and histological techniques. To confirm the initial suspicion of a lichenoid reaction, a 4-mm punch biopsy was performed on the affected areas, specifically in the temporal region. Histological findings revealed epidermal hypergranulosis, intraepithelial dyskeratosis, superficial perivascular lymphoid infiltrate, and melanophages features consistent with an induced lichenoid reaction. The Dermatology Life Quality Index (DLQI) was also used to quantify the condition's impact on the patient's daily life, resulting in a score of 8 points, reflecting moderate impairment.

One of the main challenges in this case was the need for a rapid and accurate diagnosis to initiate timely treatment, preventing lesion aggravation and psychological impact. The combination of clinical techniques and histological confirmation allowed for a definitive diagnosis of a lichenoid reaction, likely induced by previous exfoliating procedures such as nano-peels with retinoic acid (Figure 1).

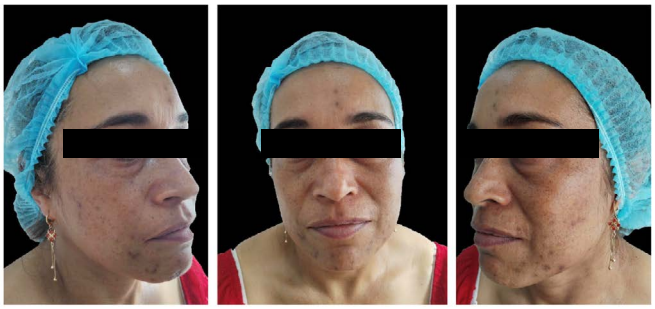

Figure 1: Patient during the initial consultation**.**

Therapeutic intervention

Therapeutic management followed a multimodal approach aimed at controlling the underlying inflammation and promoting skin regeneration. Initially, a topical treatment consisting of calcineurin inhibitors and high-potency corticosteroids was prescribed, applied once per week to reduce inflammation and modulate the immune response in the affected areas. Additionally, a low dose of oral retinoids (40 mg weekly) was introduced to enhance epidermal regeneration and prevent lesion progression (Figure 2).

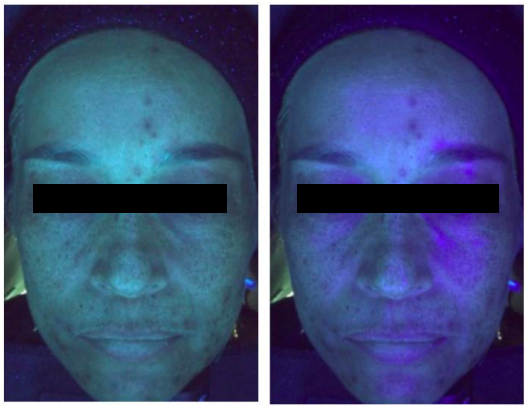

Figure 2: A. UV light B. Wood's lamp.

As part of the innovative treatment, mesotherapy sessions were implemented using exosomes derived from mesenchymal stem cells combined with autologous serum. This approach aimed to leverage the immunomodulatory and regenerative properties of exosomes to accelerate the resolution of lichenoid lesions (Figure 3). Injections were administered in the affected areas at regular intervals, with the protocol adjusted based on the patient's response.

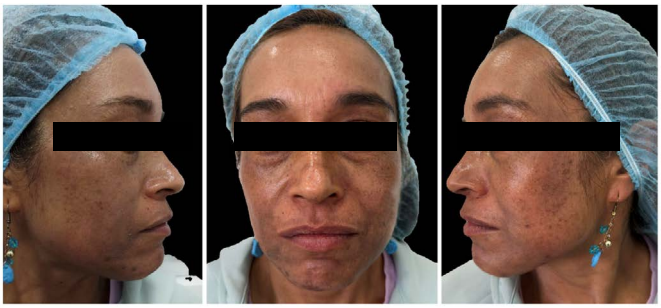

Figure 3: Patient after the second nano-peel session showing clinical signs of a lichenoid reaction.

Outcomes and follow-up

The patient's clinical evolution was remarkably favorable. Over six months, nearly complete resolution of the pigmented lesions was observed, along with significant improvement in overall skin quality, including enhanced luminosity, elasticity, and tone uniformity. Treatment efficacy was also reflected in the patient's quality of life, with her DLQI score decreasing from an initial 8 points to 3 points at the end of follow-up, indicating a mild impact on daily life.

No adverse events were reported during treatment, and the patient tolerated all proposed interventions well. These results support the safety and efficacy of exosomes as an innovative therapeutic alternative for managing lichenoid reactions, with additional benefits in skin aesthetic improvement and patient quality of life (Figure 4, Table 1).

Table 1: Patient timeline.

Month	Clinical event	Intervention
Month 1	Onset of pigmented lesions	Nano-peel and depigmenting treatment
Month 2	Development of lichenoid plaques	Biopsy and histological diagnosis
Month 3	Start of exosome mesotherapy	Weekly application for 3 sessions
Month 6	Final evaluation	Resolution of pigmentation

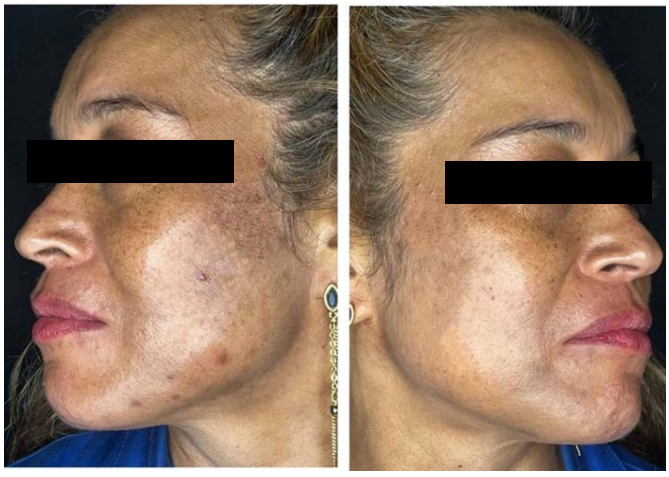

Figure 4: Patient at the end of follow-up with resolution of pigmentation.

Discussion

The use of exosomes derived from mesenchymal stem cells in managing lichenoid reactions represents an innovative approach with promising results. Although rare, this type of inflammatory reaction poses significant challenges in both diagnosis and treatment due to its diverse etiology and the lack of standardized therapeutic protocols [5,6]. In this context, exosomes stand out for their immunomodulatory and regenerative properties, which allow them to target key aspects of the pathophysiology of lichenoid reactions [7].

One of the main advantages of exosomes lies in their ability to modulate the inflammatory response at the cellular level by inhibiting proinflammatory cytokines and promoting the activity of regulatory T cells. These mechanisms not only help reduce inflammation but also facilitate tissue regeneration by stimulating dermal fibroblasts and collagen production, resulting in a comprehensive improvement in skin quality. In the presented case, these properties were evident, with near-complete resolution of pigmented lesions within a relatively short period and an overall enhancement in the appearance and health of the skin [7].

Compared to traditional therapies, which often rely on corticosteroids and immunosuppressants with their respective limitations and potential side effects, exosomes offer an alternative that combines efficacy with safety [8]. Moreover, their ability to address both the underlying inflammation and the aesthetic concerns associated with these conditions adds significant value to the treatment, particularly in contexts where the impact on the patient's quality of life is a critical consideration [5].

However, while the results achieved in this case are encouraging, it is important to acknowledge the current limitations in the knowledge and evidence regarding the use of exosomes in clinical dermatology. Existing studies are limited in both number and sample size, highlighting the need for larger and more rigorous research to evaluate not only their efficacy and safety but also aspects such as dose optimization, frequency of administration, and potential long-term effects. Such studies will be essential to validate these initial findings and establish exosomes as a standard therapeutic tool in managing lichenoid reactions and other inflammatory skin conditions.

In conclusion, this case not only demonstrates the feasibility of exosomes as an innovative therapeutic option but also opens the door to new possibilities in regenerative dermatology. It underscores their potential to transform the management of complex skin diseases with a more comprehensive and patient-centered approach.

References

1. Shen Z, Huang W, Liu J, Tian J, Wang S, et al. Effects of Mesenchymal Stem Cell-Derived Exosomes on Autoimmune Diseases. *Front Immunol*. 2021; 12: 749192.
2. Mendt M, Rezvani K, Shpall E. Mesenchymal stem cell-derived exosomes for clinical use. *Bone Marrow Transplant*. 2019; 54: 789-792.
3. Harrell CR, Jovicic N, Djonov V, Volarevic V. Therapeutic Use of Mesenchymal Stem Cell-Derived Exosomes: From Basic Science to Clinics. *Pharmaceutics*. 2020; 12: 474.
4. Ha DH, Kim H keun, Lee J, Kwon HH, Park GH, Yang SH, et al. Mesenchymal Stem/Stromal Cell-Derived Exosomes for Immunomodulatory Therapeutics and Skin Regeneration. *Cells*. 2020; 9: 1157.
5. Chernoff G. The Utilization of Human Placental Mesenchymal Stem Cell Derived Exosomes in Aging Skin: An Investigational Pilot Study. *J Surg*. 2021; 6: 1388.
6. Shi Y, Wang Y, Li Q, Liu K, Hou J, et al. Immunoregulatory mechanisms of mesenchymal stem and stromal cells in inflammatory diseases. *Nat Rev Nephrol*. 2018; 14: 493-507.
7. Zhang W, Wang Y, Kong Y. Exosomes Derived from Mesenchymal Stem Cells Modulate miR-126 to Ameliorate Hyperglycemia-Induced Retinal Inflammation Via Targeting HMGB1. *Investig Opthalmology Vis Sci*. 2019; 60: 294.
8. Sun W, Yan S, Yang C, Yang J, Wang H, et al. Mesenchymal Stem Cells-derived Exosomes Ameliorate Lupus by Inducing M2 Macrophage Polarization and Regulatory T Cell Expansion in MRL/lpr Mice. *Immunol Invest*. 2022; 51: 1785-1803.

[*]***Correspondence:*** Andrea Carolina Díaz Manrique2, General Practitioner, Universidad El Bosque, Bogotá D.C., Colombia, E-mail: draandreacdiaz@gmail.com

Received: July 31, 2025; **Accepted:** Sep 01, 2025; **Published:** Sep 05, 2025

Citation: Huerfano AMG, Manrique ACD, Montoya TMMV. Exosome Performance in the Management of Lichenoid Reactions: Case Report. *J Clin Case Rep Rev*. 2025; 6: 169.