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Treatment of vulvar lichen sclerosus with a fractional CO₂ laser — case report

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ABSTRACT

Vulvar lichen sclerosus (VLS) belongs to the group of autoimmune, chronic inflammatory skin disorders and is most frequent in females after their 50s. This disease might lead to vulvar scarring, sexual dysfunction and neoplasm transformation. For that reason, treatment of VLS is still considered an important clinical issue from the borderline of gynaecology and dermatology. Classical treatment includes the use of corticosteroids, which help to relieve symptoms, prevent further scarring of the vulva, reduce inflammation and reduce the risk of malignant transformation. Due to the resistance of some patients to local treatment and its complications, however, the use of fractional CO₂ lasers in the treatment of VLS has been proposed. A 41-year-old female patient presented to a gynaecologist with symptoms such as itching, burning, and cracking of the vulva skin. A tissue sample was taken from the affected area and a histopathological examination confirmed the initial diagnosis. Treatment with topical glucocorticosteroids was applied, but no improvement was noticed. For that reason, a CO₂ fractional laser was applied to the therapy with complementary treatment in the form of topical glucocorticosteroids. After 1.5 years, regression of lesions on the skin of the vulva was observed. This case report highlights the effectiveness of fractionated CO₂ laser in the treatment of VLS resistant to glucocorticosteroid monotherapy.

Key words: vulvar lichen sclerosus; lichen sclerosus; CO₂ laser; fractional CO₂ laser

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Introduction

Vulvar lichen sclerosus (VLS) is a chronic inflammatory dermatosis that can lead to vulvar scarring and sexual dysfunction [1].

Typical lesions are white plaques and papules, often with areas of ecchymosis, excoriations and ulcerations, with the destruction of the vulva architecture. 4–7% of women with vulvar lichen sclerosus develop vulvar cancer [2, 3].

Physical examination reveals atrophic ivory-coloured plaques with a waxy texture, depigmentation or hyperpigmentation, ecchymosis, labia resorption, intravaginations, lichenization, ulcerations, scarring and deformation of the vulva [4].

The most common symptoms a patient with lichen sclerosus presents to a gynaecologist are itching, pain, burning and painful intercourse [2, 4].

In most cases, the diagnosis of vulvar lichen sclerosus is based on the presence of characteristic clinical features. In the case of diagnostic uncertainty,

a section is taken and histopathological tests are performed. Early diagnosis and treatment of vulvar lichen sclerosus reduce the risk of scarring lesions and cancer development [2, 4].

Treatment includes topical application of potent glucocorticoids (e.g. clobetasol propionate 0.05%) which help to relieve symptoms, prevent further scarring of the vulva, reduce inflammation and reduce the risk of malignant transformation [5, 6].

VLS may be associated with other immune disorders such as morphea or scleroderma, systemic sclerosis, Hashimoto's thyroiditis, rheumatoid arthritis, psoriasis, type 1 diabetes, and alopecia areata [7].

The aetiology of VLS formation includes autoimmune, infectious, genetic and hormonal factors [5]. It is reported that VLS may develop as a result of atopy, allergic contact dermatitis, obesity or anatomical abnormality [5].

The differential diagnosis of VLS in the anogenital area includes genital lichen planus, vitiligo, morphea,

scarring pemphigoid, vulvar intraepithelial neoplasia (VIN), and extraluminal Paget's disease [1, 8].

Due to the resistance of some patients to local treatment and its complications, the use of fractional CO2 lasers in the treatment of VLS has been proposed [9, 10].

Objective

This case report aimed to present the diagnostic and therapeutic process of a patient with vulvar lichen sclerosus, and to highlight the challenges that occur during the process. Also, to estimate the efficacy of fractionated carbon dioxide (CO₂) laser therapy for vulvar lichen sclerosus.

Material and methods

The material for this case study was collected from the real-life clinical process and medical records of the gynaecologist's office in Bedzin, Poland. Following the Helsinki Declaration, the case report was fully anonymised, and none of the data presented in it make it possible to identify the patient. Such case reporting, according to Polish law, does not require the consent of the Bioethics Committee.

Case study

A 41-year-old female patient came to the gynaecologist's office with symptoms such as itching, burning, and cracking of the vulva skin. Based on physical examination and medical history, vulvar lichen sclerosus was suspected. A piece of tissue was taken from the affected area for histopathological examination. The result of the histopathological examination confirmed the initial diagnosis. Treatment with topical glucocorticosteroids was applied, but no changes were observed. Due to the lack of improvement after local treatment, a decision was made to add a CO2 fractional laser to the therapy. A Beladona CO2 laser with a wavelength of 10600 nm and pulse energy in the fractional mode of 1–115 mJ was used. Complementary treatment with topical glucocorticosteroids was applied. The patient used ointments with cortisol, hydrocortisone and clobetasol. In addition, she also applied an ointment with neomycin sulphate and natamycin. The patient underwent 4 cycles of monthly laser therapy. Subsequently, CO2 fractional laser sessions were held every 3–4 months until symptoms disappeared. After 1.5 years, regression of lesions on the skin of the vulva was observed, and the patient stopped complaining of itching and discomfort.



Figure 1. Vulvar lichen sclerosus after treatment with the use of fractionated CO2 laser

Discussion

The clinical symptoms observed in this case report were consistent with the data presented in original and review articles as well as other case reports published in recent years.

Treatment with topical corticosteroids is effective in some patients, but it can cause serious side effects, including atrophy, thinning of the skin, infections, and adrenal insufficiency. Moreover, topical treatment is long-lasting and requires the cooperation of the patient with the doctor and strict adherence to the recommendations [5, 6].

Lee et al. reported a case series of four patients undergoing fractional carbon dioxide laser resurfacing in patients with hyperkeratotic vulval lichen sclerosus not responding to super-potent topical corticosteroids [10]. Disease remission was achieved in patients treated with CO2 fractional laser. Their disease became amenable to treatment with topical glucocorticosteroids [10]. Similarly, Stewart K. demonstrated significant improvement in clinical symptoms, histopathological findings and quality of life in the group of 12 women diagnosed with VLS which undergone CO2 fractionated laser therapy [11]. On the contrary, results obtained from a clinical randomized trial conducted by Michell



Figure 2. Control picture

L. et. al. on 40 patients with vulvar lichen sclerosus suggest that fractioned CO₂ laser used only in monotherapy is not sufficiently effective in VLS treatment due to slight improvement in histopathology scale score [12]. Also, a systematic review conducted by Tasker F. et al highlight that the effectiveness and safety of fractioned CO₂ laser in VLS therapy must be verified in well-planned randomized clinical trials. The authors analysed 24 studies with 616 participants, all studies which met inclusion criteria concerned using of fractioned CO₂ laser in the treatment of genital LS (lichen sclerosus) in both sexes [13].

Conclusions

VLS has a significant impact on the quality of life of patients. Many affected people experience discomfort in intimate situations, and some experience persistent itching and pain. many women are concerned about

how the disease might progress, especially because of the condition's potential for cancerous changes. VLS treatment can be associated with multiple challenges and complications such as different severity and clinical picture of the disease, risk for neoplasm transformation, and occurrence of sexual disorders [11]. Additionally, classical management with the use of corticosteroids is not effective in all cases, especially in those with late-stage diagnosis, high activity of the disease and lack of patient compliance [11]. Therefore, it is important to find an effective method of treatment that would significantly improve patients' quality of life and prognosis. The use of CO₂ fractional laser seems to be a promising therapeutic method for patients suffering from VLS.

Fractional CO₂ laser treatment is safe and can be an effective rescue procedure for patients with lichen sclerosus who do not respond to long-term, very strong topical corticosteroid treatment. Furthermore, the CO₂ laser belongs among the most popular lasers used in dermatology and its application was reported to be effective in the treatment of numerous skin diseases such as psoriasis, leukoplakia, acne, skin ulcers and fibromas [14].

However, the use of this type of therapy requires further randomized trials with a larger study group. The study group should also be differentiated in terms of age and whether they are before or after menopause.

Since very often patients with VLS are also burdened with other diseases, treatment with CO₂ fractional laser reduces the need to use additional medications. Not having to use medications daily can increase compliance. The fractional CO₂ laser was found to be effective in lichen sclerosus treatment in many studies [12, 15, 16]. The most significant advantage of this therapeutic procedure includes non-invasiveness, limited side effects, positive changes in histopathological findings and achievement of remission [11].

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