Vulvar Lichen Sclerosus: Bridging Dermatovenerological and Gynecological Management in Clinical Practice

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Abstract

Vulvar lichen sclerosus (VLS) is a chronic inflammatory dermatosis with significant implications for gynecological health, sexual function, and oncological risk. This review synthesizes current evidence on the pathophysiology, diagnostic approaches, and therapeutic strategies employed across dermatovenerology and gynecology disciplines. A systematic literature analysis was conducted using PubMed, Scopus, and EMBASE databases, covering publications from 2014 to 2024. Findings indicate that high-potency topical corticosteroids remain the first-line treatment, while emerging modalities including platelet-rich plasma, fractional CO2 laser, and biologics demonstrate promising efficacy in refractory cases. Collaborative management between dermatologists and gynecologists significantly improves diagnostic accuracy and treatment adherence. The malignant transformation risk to squamous cell carcinoma underscores the necessity of long-term surveillance. Multidisciplinary integration of dermatovenerological and gynecological expertise represents the optimal framework for comprehensive VLS management, addressing dermatological manifestations and reproductive health consequences simultaneously.

Keywords: *vulvar lichen sclerosus; dermatovenerology; gynecology; topical corticosteroids; platelet-rich plasma; CO2 laser; multidisciplinary management; squamous cell carcinoma; autoimmunity*

1. Introduction

Vulvar lichen sclerosus (VLS) is a chronic, progressive, inflammatory dermatosis of the anogenital region that stands at the crossroads of dermatovenerology and gynecology. First described in the late nineteenth century, VLS predominantly affects women, with a bimodal distribution peaking in prepubertal girls and postmenopausal women [1, 2]. Its hallmark features—progressive scarring, architectural distortion, and an elevated risk of squamous cell carcinoma (SCC)—make timely recognition and systematic management a clinical imperative [3, 4].

The global prevalence of VLS is estimated at 1 in 70 to 1 in 300 women, although true figures are likely higher due to underdiagnosis [5, 6]. The condition significantly impairs quality of life, causing intractable pruritus, dyspareunia, and functional restriction of the vulvar architecture, including labial fusion and clitoral phimosis [7].

Despite its burden, patients frequently experience diagnostic delays of up to six years, often consulting multiple specialties before receiving a definitive diagnosis [8].

The pathophysiology of VLS is multifactorial. Autoimmune mechanisms are central, with approximately 30% of patients exhibiting co-existing autoimmune conditions such as thyroid disease, vitiligo, or alopecia areata [9, 13]. Genetic susceptibility, local hormonal deficiencies—particularly of dihydrotestosterone—and chronic microtrauma contribute to the inflammatory cascade leading to dermal sclerosis and epidermal atrophy [14, 15]. Emerging evidence implicates altered cutaneous microbiomes and extracellular matrix remodeling proteins in driving disease progression [51].

The oncological risk associated with VLS is significant: SCC of the vulva develops in approximately 4–6% of affected women over lifetime follow-up [9, 10]. Differentiated vulvar intraepithelial neoplasia (dVIN) frequently arises within VLS lesions as a precursor, necessitating vigilant long-term surveillance [32, 33].

Historically, management of VLS has been siloed within either dermatology or gynecology, resulting in fragmented care. Recognition that VLS demands input from both disciplines—dermatovenerological expertise for skin-directed therapy and immunomodulation, and gynecological expertise for surgical intervention and reproductive health management—has driven a paradigm shift toward multidisciplinary care [16, 36]. This article reviews current evidence on the pathophysiology, diagnostic criteria, and comparative therapeutic strategies for VLS, underscoring the imperative for integrated dermatovenerological and gynecological management.

2. Methods

This narrative review was conducted according to a pre-defined protocol. Electronic databases including PubMed, Scopus, EMBASE, and Cochrane Library were searched for studies published between January 2014 and March 2024. Search terms included combinations of "vulvar lichen sclerosus," "dermatovenerology," "gynecology," "topical corticosteroids," "platelet-rich plasma," "CO2 laser," "biologic therapy," "multidisciplinary management," and "oncological risk." Inclusion criteria encompassed original research articles, systematic reviews, meta-analyses, randomized controlled trials, and clinical guidelines in the English language. Case reports were included when describing novel or rare therapeutic outcomes. Studies exclusively addressing extragenital lichen sclerosus or lichen planus were excluded. Data extraction focused on treatment efficacy, adverse effects, follow-up protocols, and interdisciplinary collaboration models. A total of 60 high-quality references were synthesized to construct the evidence base for this review.

3. Results

A total of 60 references were included in this narrative synthesis. Eight major treatment modalities were identified across the included literature, ranging from established pharmacological agents to emerging procedural interventions (Table 1).

High-potency topical corticosteroids (TCS), primarily clobetasol propionate 0.05%, were universally endorsed as the first-line treatment for VLS across all included guidelines and clinical trials. Reported response rates ranged from 70–90%, with the majority of patients achieving symptomatic control and partial architectural restoration with daily application for three months, followed by a maintenance regimen. The most common adverse effects were skin atrophy and striae, particularly with prolonged use exceeding six months without tapering [7, 12, 20].

Topical calcineurin inhibitors—predominantly tacrolimus 0.1% ointment—were identified as evidence-based second-line agents in patients intolerant to or unresponsive to TCS. Efficacy rates of 60–75% were reported in prospective studies, with the advantage of avoiding skin atrophy. Burning and irritation upon initial application were the most frequently cited side effects, resolving with continued use in the majority of patients [22, 24].

Platelet-rich plasma (PRP) emerged as one of the most investigated emerging therapies, with studies demonstrating 65–80% improvement in symptom scores and tissue integrity parameters. Intralesional and topical PRP application was found to stimulate collagen synthesis, reduce inflammatory infiltrates, and improve epithelial thickness. Adverse effects were minimal, conferring a favorable safety profile for long-term use [29, 30].

Fractional carbon dioxide (CO2) laser therapy demonstrated efficacy rates of 70–85% in studies involving postmenopausal women with atrophic VLS. Microablative fractional techniques were associated with tissue remodeling, neocollagenesis, and improved mucosal hydration. Transient post-procedural dyspareunia was the principal side effect, resolving within four to six weeks. Three sessions at monthly intervals represented the optimal treatment protocol in the reviewed studies [26, 27].

Dupilumab, a biologic agent targeting the interleukin-4 and interleukin-13 pathways, was evaluated in investigational studies as a treatment for refractory VLS with prominent Th2-inflammatory signatures. Preliminary efficacy of approximately 60% was reported; however, larger randomized controlled trials are required to establish its role in routine management [18].

Surgical interventions, including vulvoplasty and labial adhesiolysis, were reserved for patients with severe architectural distortion causing functional impairment. While effective for restoration of anatomy, surgical outcomes were variable, and recurrence of VLS at the surgical margin necessitated continuation of medical therapy postoperatively [31, 41, 53].

Photodynamic therapy (PDT) demonstrated moderate efficacy (55–70%) in smaller case series, particularly in patients seeking non-pharmacological alternatives. Photosensitivity reactions were the predominant adverse effect. PDT was positioned as an adjunctive modality rather than a primary therapy in the evidence hierarchy [48].

Follow-up protocols across reviewed studies were inconsistent; however, consensus guidelines recommended interval surveillance at three months during active treatment

and every six to twelve months during maintenance, with particular attention to biopsying any areas suspicious for dVIN or malignant transformation [36].

Table 1. Comparative Overview of Treatment Modalities for Vulvar Lichen Sclerosus

Treatment Modality	Line	Efficacy (%)	Side Effects	Mechanism	Follow-up
High-Potency TCS (Clobetasol 0.05%)	First-line	70–90%	Atrophy, striae	Recommended	Monthly
Topical Calcineurin Inhibitors (Tacrolimus)	Second-line	60–75%	Burning, irritation	Non-steroidal	Every 3 months
Platelet-Rich Plasma (PRP)	Emerging	65–80%	Minimal	Regenerative	Every 3–6 months
Fractional CO_2 Laser	Emerging	70–85%	Transient dyspareunia	Tissue remodeling	Every 3–6 months
Topical Testosterone	Historical	40–55%	Virilization	Largely abandoned	Monthly
Dupilumab (Biologic)	Investigational	~60%	Injection site reaction	Anti-IL-4/IL-13	Every 3 months
Surgical Vulvoplasty	Adjunctive	Variable	Scarring, dehiscence	Severe anatomical loss	Post-procedure
Photodynamic Therapy (PDT)	Emerging	55–70%	Photosensitivity	Moderate	Every 3–6 months

TCS — topical corticosteroids; PRP — platelet-rich plasma; CO2 — carbon dioxide; PDT — photodynamic therapy.

4. Discussion

The synthesis of evidence presented in this review confirms that VLS occupies a unique position in the medical landscape, requiring expertise simultaneously drawn from dermatovenerology and gynecology. The multifactorial etiopathogenesis—spanning immune dysregulation, hormonal deficiency, genetic predisposition, and microbiome alterations—demands a management framework that addresses each dimension comprehensively [9, 13, 16].

The primacy of high-potency TCS in first-line management is supported by robust evidence from randomized controlled trials and long-term cohort studies. However, the paradox of steroid-induced atrophy in a disease already characterized by epidermal thinning underscores the need for precise application protocols and regular reassessment by clinicians trained in vulvar dermatology [7, 20, 60]. Dermatovenerologists are uniquely positioned to supervise long-term TCS regimens,

while gynecologists contribute critical perspective on the functional and reproductive implications of progressive scarring.

The growing interest in regenerative medicine approaches—particularly PRP and fractional laser therapy—reflects an important shift in the VLS treatment paradigm [26, 29, 30]. These modalities address not only symptom control but also the structural restoration of vulvar tissue, potentially reversing architectural changes when instituted early. Early evidence suggests that combination protocols pairing TCS with PRP or laser may yield superior outcomes to monotherapy; however, standardization of technique, concentration parameters, and treatment intervals remains an unmet need in the field [27].

The oncological surveillance dimension of VLS management falls squarely within the competence of both the dermatovenerologist and the gynecologist. The incidence of SCC arising in the background of VLS has been consistently reported at 4–6% in long-term follow-up studies, with dVIN as the penultimate precursor lesion [9, 32, 34]. Clinical surveillance must be performed at defined intervals, with a low threshold for biopsy of any evolving lesion. Dermoscopy has emerged as a valuable tool for non-invasive monitoring of VLS lesions, facilitating the identification of suspicious features warranting histopathological evaluation [35, 55].

Systemic therapies, including retinoids, hydroxychloroquine, and methotrexate, have historically been reserved for recalcitrant cases unresponsive to topical modalities. The recent advent of targeted biologics, particularly dupilumab, represents a mechanistically rational option for the subset of patients with a pronounced Th2-mediated inflammatory signature [18]. The intersection of VLS with broader immune-mediated dermatological conditions creates opportunities for dermatovenerological expertise to guide biologic selection and monitoring.

A critical and underrecognized dimension of VLS is its psychosexual impact. Studies consistently demonstrate significant impairment in sexual function, self-image, and psychological wellbeing among affected women [38, 49]. Gynecologists are optimally placed to address the psychosexual sequelae, facilitate sexual rehabilitation post-treatment, and coordinate referrals to pelvic floor physiotherapy and psychosexual counseling. Integration of patient-reported outcome measures into routine VLS monitoring represents an emerging best practice.

The evidence collectively supports the concept of a multidisciplinary VLS clinic, incorporating dermatology, gynecology, psychosexual medicine, and pelvic floor physiotherapy as a model of optimal care delivery. Such clinics have demonstrated improvements in diagnostic accuracy, treatment adherence, and patient satisfaction in limited implementation studies [36, 37]. Expansion of this model to resource-limited settings, including Central Asian healthcare contexts such as those in Uzbekistan, warrants dedicated attention to specialist training, diagnostic infrastructure, and patient education.

5. Conclusion

Vulvar lichen sclerosus is a chronic, potentially premalignant inflammatory dermatosis demanding lifelong specialist management at the intersection of dermatovenerology and gynecology. This review demonstrates that no single therapeutic modality offers universal efficacy, and that the optimal management of VLS is inherently multidisciplinary. High-potency topical corticosteroids remain the cornerstone of first-line therapy, while emerging modalities including platelet-rich plasma and fractional CO2 laser offer promising avenues for tissue restoration and sustained remission. The oncological risk intrinsic to VLS necessitates systematic long-term surveillance, incorporating regular clinical examination, dermoscopic evaluation, and selective biopsy. Beyond physical management, the psychosexual burden of VLS demands integrated gynecological and psychosocial support. Establishing collaborative multidisciplinary VLS care models—bringing together dermatovenerologists, gynecologists, and allied health professionals—represents the most compelling and evidence-aligned advance available to improve patient outcomes. Clinicians at the Fergana Medical Institute of Public Health and analogous institutions are positioned to champion this integrative approach, setting new standards for comprehensive vulvar disease management in Central Asia and beyond.

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