SAGE Open Medical Case Reports

SAGE Open Medical Case Reports
JCMS Case Reports
Volume 12: 1–4

DOI: 10.1177/2050313X241289555
journals.sagepub.com/home/sco
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Challenges in diagnosing spongiotic dermatitis: A complex case report

Joshua Lewis[1], Bethel D Desta[1], Oyetokunbo Ibidapo-Obe[2] and Ernst J Nicanord[2]

Abstract

This case study presents a challenging case of spongiotic dermatitis manifesting in the vaginal region. Spongiotic dermatitis, characterized by fluid buildup causing skin swelling, poses diagnostic difficulties due to its resemblance to other skin conditions. A 64-year-old female initially misdiagnosed with various genital infections underwent multiple treatments without relief. With Sexually Transmitted Diseases (STD) tests being negative, a biopsy later revealed spongiotic dermatitis. Histological examination confirmed characteristic features of spongiotic dermatitis, guiding definitive diagnosis. Following confirmation of spongiotic dermatitis through biopsy, the patient received appropriate treatment, leading to the resolution of symptoms. This case underscores the importance of biopsy in diagnosing spongiotic dermatitis amidst variable clinical presentations, highlighting the need for further research to understand spongiotic dermatitis prognosis and clinical manifestations.

Keywords

Spongiotic dermatitis, biopsy, dermatology, case study

Date received: 22 May 2024; accepted: 17 June 2024

Introduction

Spongiotic dermatitis (SD) is a complex skin condition characterized by the accumulation of fluid within the skin, leading to swelling and separation between skin cells.[1] This dermatological disorder typically manifests with symptoms of redness, swelling, intense itching, and occasionally blistering of the affected skin. Various factors can contribute to SD development such as environmental irritants, such as perfumes, as well as stress, such as hormonal changes.[2,3] SD initially presents as a reddish rash; however, if left untreated, the condition may progress and become chronic. Thus, topical medications are used to reduce both itching and inflammation.[4] However, diagnosing SD can be challenging due to its resemblance to several other skin conditions, including allergic contact dermatitis, atopic dermatitis (eczema), irritant contact dermatitis, and specific fungal or bacterial infections.[5] The similarities in clinical presentation often necessitate a biopsy for an accurate diagnosis of SD. Histological examination is vital for identifying SD, as it reveals a sponge-like appearance, widening of intercellular spaces within the epidermis, and evidence of edema.[6] Despite these diagnostic criteria, SD remains elusive to diagnose definitively in some cases due to variations in its symptomatology among individuals. The variability in symptoms underscores the importance of SD presentation in different case studies and the complexity of diagnosing.

Case report

A 64-year-old female presented to the family medicine clinic for evaluation and treatment of vaginal irritation. Patient initially presented to an urgent care for 1 week of painful genital lesions. She was diagnosed with a urinary tract infection and fungal dermatitis. A prescription was written for nitrofurantoin 100 mg by mouth twice daily for 5 days, metronidazole 500 mg by mouth twice daily, and ketoconazole 2% cream applied twice daily. She reported no relief from her symptoms with this treatment regimen. The patient then presented to the

[1]John Sealy School of Medicine, University of Texas Medical Branch, Galveston, TX, USA
[2]Department of Family Medicine, University of Texas Medical Branch John Sealy Hospital, Galveston, TX, USA

Corresponding Author:
Joshua Lewis, John Sealy School of Medicine, University of Texas Medical Branch, 301 University Boulevard, Galveston, TX 77555-1317, USA.
Email: joslewis@Utmb.edu

Figure 1. Rash at the time of presentation and at 4 weeks. (a) Initial diagnosis. (b) At 4 weeks.

emergency department 2 days later with intractable groin pain, worsened dysuria, a subjective fever, and some vaginal discharge due to worsening lesions. The patient was diagnosed with chancroid and herpes simplex virus, then she was started on empiric therapy with azithromycin 1 g by mouth and acyclovir 600 mg three times daily for 10 days. On follow-up presentation with her primary care physician 2 weeks later, lesions and symptoms were almost completely resolved; however, she still reported a slight itch. After another 2 weeks, the lesions had returned, with symptoms described as intense, leading to her presentation at our facility (Figure 1).

The patient denied any previous sexual intercourse, recent episodes of vaginal penetration, changes in detergents, or any scratching or trauma to her vagina. Initial vitals on admission were normal (blood pressure 122/77, respiratory rate 18/min, temperature 98.2°F (36.8°C), and pulse 65 bpm). Skin examination of the pelvic region showed no edema, drainage, or fluctuance. Mucosa appeared in dark purple and white patches in a thick reticular pattern. The patient had no right or left inguinal adenopathy lymphadenopathy. Initial labs showed normal white blood cell count, hemoglobin, and platelet counts. Additional labs showed an elevated eosinophil count of 0/46 (reference range 0.03–0.39 bil/L). Tests for sexually transmitted diseases were all negative. Specific tests were done and the results are outlined in Table 1. The care team compiled an extensive list of differential diagnoses, considering various underlying factors contributing to her symptoms and presentations (Table 2).

The patient was restarted on topical triamcinolone 2% and ketoconazole 2% twice daily and referred to dermatology, who diagnosed her with intertrigo dermatitis. Dermatology switched the triamcinolone ointment to hydrocortisone 2% cream with ketoconazole 2% cream. Additionally, she was prescribed an antifungal powder to use once daily after lesions have cleared. At 41 weeks after initial presentation, the patient returned to her primary care physician for unimproved symptoms, when a vulvar skin punch biopsy was performed, and the specimen was sent to Pathology. The biopsy revealed SD with superficial perivascular dermal inflammation and exocytosis of lymphocytes into the overlying epidermis (Figure 2(a)–(c)).

The biopsy was performed on day 24 from the presentation of vaginal pain because we initially thought the presentation was an Sexually Transmitted Diseases (STD). Upon confirmation of SD, the patient was then prescribed

Table 1. Sexually transmitted diseases test orders and their results.

Test	Results
Herpes Simplex virus 1 and 2	Negative
Human Immunodeficiency virus (HIV) virus 1 and 2	Negative
Vaginal pathogens	Negative
Point of Care Test (POCT) urinalysis	Negative
Urine culture	10,000 CFU *Escherichia coli*, pan sensitive
Hepatitis C virus	Negative
Pap smear and Human Papillomavirus (HPV)	Negative/negative
Gonorrhea/Chlamydia	Negative/negative
Deep wound culture	No growth

Table 2. Differential diagnosis, reasoning for the diagnosis, and why it was ruled out.

Date	Day No.	Events	Diagnostic test and intervention
22/21	0	Sudden onset severe vaginal pain and possible blister-like rash that worsens with urination	Urinalysis: (250 Red Blood Cell, +1 Lupus Erythematosus Cell Test) Urine culture: 10,000 *Staphylococcus aureus* Pap smear-liquid based: NILM High-risk Human Papillomavirus (HPV)-thin prep: Negative Hepatitis C Virus antibody: Negative Complete Blood count with diff: Elevated eosinophil count (0.46 $10 \times 3/\mu L$) Urinalysis microscopic: slight mucous Referral to dermatology for biopsy
12/09	19	Continued discoloration and pruritis in vaginal and perianal region Diagnosed with intertrigo of the gluteal cleft and inguinal folds Favor that previous purulent rash was superinfection of an underlying dermatitis	Start hydrocortisone 2.5% cream + ketoconazole 2% cream BIDPRN (mix equal amounts when applying). eRx sent When clear, apply Zeasorb AF powder daily to sites prone to flaring Return to clinic in 2 months
12/14	24	Worsening rash due to medications	Punch Biopsy performed Lidocaine 2% (XYLOCAINE) 20 mg/mL (2%) injection 5 mL
03/13	113	Reports continued vaginal pain as "pin pricks" of pain and sporadic "itching" Last episode of pain was a week prior and self-resolved after a few minutes without recurrence	Biopsy results show spongiotic dermatitis Prescribed lidocaine 2% mucosal jelly; apply dime size amount to affected area BID. Dispense 30 mL; Refill: 2
09/06	290	Return of symptoms of spongiotic dermatitis	Resume using the clobetasol 0.05% BID until symptom resolution
11/07	352	Spongiotic dermatitis: Chronic, stable, in remission	Continue clobetasol 0.05% ointment, apply to area(s) two times daily. Dispense: 15 g; Refill: 3

NILM: Negative for Intraepithelial Lesion of Malignancy.

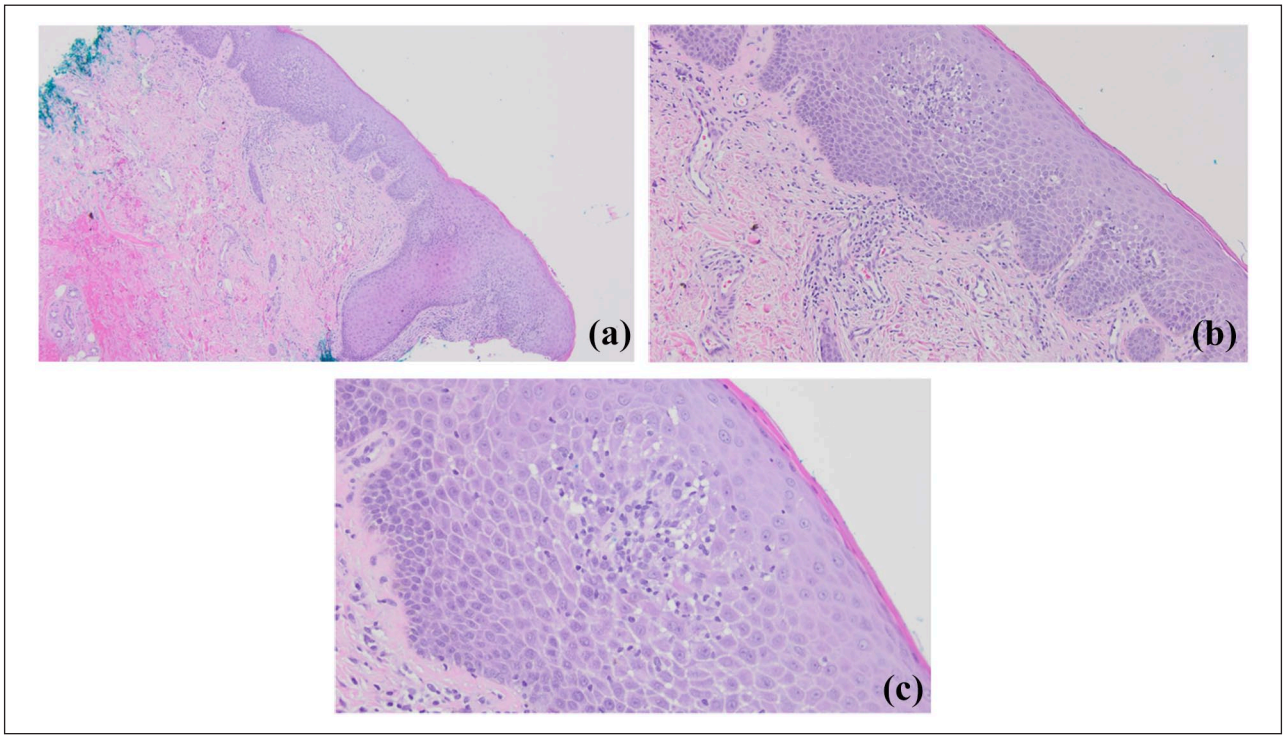

Figure 2. (a) Squamous acanthosis with moderate spongiosis, parakeratosis, and mild superficial perivascular dermal inflammation (H&E, 40×). (b) Superficial perivascular dermal inflammation with exocytosis of lymphocytes into the overlying epidermis (H&E, 100×). (c) More detail of spongiosis with exocytosis and parakeratosis.
H&E: hematoxylin and eosin.

clobetasol 0.05% ointment. Her symptoms were resolved, and she had no flare-ups in the 12 weeks since being prescribed clobetasol.

Conclusion

This report presents a complex case of treatment of SD which took nearly a year to resolve. The difficulty in diagnosing SD is that the symptoms are common to those of other skin conditions and the appearance can vary widely among individuals. The histopathological features include squamous acanthosis with moderate spongiosis, parakeratosis, and mild superficial perivascular dermal inflammation. Additionally, laboratory results show an elevated eosinophil count. Clinical findings did not initially present as SD. However, the histopathological features were characteristics of SD: accumulation of edema in the intercellular spaces of the epidermis, parakeratosis above these areas, and exocytosis. The biopsy and histological examination provided the histological features, which allowed for a definitive diagnosis. The prolonged course in diagnosing and treating SD in this patient highlights the complexities and challenges of diagnosing SD. Due to the variable presentation, a biopsy and histological examination is essential for a definitive diagnosis. SD should be suspected particularly in patients with persistent vulvar symptoms, to administer appropriate treatment. Further research needs to be conducted in different clinical presentations of SD to avoid delayed prognosis in patients. SD is a very common skin reaction; however, it is very nonspecific as well. As such, the diagnosis is confirmed by histology. This case highlights a presentation of SD in the vaginal region. Given the variable presentation, biopsy, and histological examination are crucial for diagnosis and for advancing research into the clinical pathogenesis and manifestations.

Author contributions

Joshua Lewis: Writing—original draft, writing- revising and editing, Conceptualization, Data Curation; Bethel D Desta: Writing—original draft, writing- revising and editing; Ernst J Nicanord: Investigation; supervision, Conceptualization, Data curation; Oyetokunbo Ibidapo-Obe: Writing, original draft. All authors reviewed and approved the final draft.

Data availability statement

The data used in this case study are derived from primary sources collected as part of the research project. Due to confidentiality and privacy concerns, the patient's information cannot be made publicly available. However, information supporting the findings of this case study is available upon request for verification and validation purposes.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This project was funded in part by the Department of Health and Human Services, Health Resources and Services Administration (HRSA), through its grant to the UTMB Center of Excellence for Professional Advancement and Research (grant number 1 D34HP49234-01-00). HRSA had no role in decisions related to the research, authorship, or publication of this article.

Ethical statement

University of Texas Medical Branch Institutional Review Board exempted the need for ethical approval or study.

Patient consent

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

Consent to publish statement

The authors of this case study grant consent for its publication in this journal. We affirm that all individuals mentioned in the study have provided consent for their data or information to be included, if applicable. We understand that the publication will be made available to the public and give permission for its dissemination.

ORCID iD

Joshua Lewis https://orcid.org/0009-0001-4785-2011

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