

Zoon Balanitis Revisited: Report of Balanitis Circumscripta Plasmacellularis Resolving With Topical Mupirocin Ointment Monotherapy

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ABSTRACT

Introduction: Zoon balanitis is an idiopathic benign inflammatory condition of the glans penis and prepuce. A patient with biopsy confirmed diagnosis of Zoon balanitis who was successfully treated with topical mupirocin ointment monotherapy is described.

Method: A search using PubMed database was performed using the following terms: Zoon balanitis (cases, diagnosis, treatment of), balanitis circumscripta plasmacellularis, and mupirocin. Relevant papers and their reference citations were reviewed and evaluated.

Results: The gold standard of treatment for Zoon balanitis has previously been circumcision. More recently, topical calcineurin inhibitors have been shown to be effective. Our patient had successful resolution of his Zoon balanitis after 3 months of mupirocin ointment monotherapy.

Discussion: Zoon balanitis is a benign inflammatory dermatosis. Previous successful treatment modalities include circumcision, phototherapy, laser therapy, and topical calcineurin inhibitors. Topical mupirocin ointment twice daily resulted in resolution of Zoon balanitis in our patient. Additional evaluation of mupirocin ointment as a therapeutic agent should be considered as a potential first-line therapy in patients with Zoon balanitis.

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INTRODUCTION

Zoon balanitis, also referred to as balanitis circumscripta plasmacellularis, is a rare, idiopathic, benign inflammatory condition of the penis that mainly affects middle-aged to elderly uncircumcised men. The standard of treatment is circumcision, but many patients prefer a non-surgical modality. We report a man with Zoon balanitis who was successfully treated with topical mupirocin ointment.

CASE REPORT

A 62-year-old healthy, heterosexual, uncircumcised male presented for our evaluation of an asymptomatic red lesion on his foreskin and glans penis that he noticed after beginning ciprofloxacin for prostatitis. His primary care physician initially prescribed lotrimin, which improved the rash on his glans penis; however, the lesion on his foreskin persisted. In addition, he had phimosis and experienced difficulty retracting his foreskin during intercourse.

Clinical examination revealed an uncircumcised man. Upon retraction of the foreskin, a 1cm erythematous, non-tender plaque extending from the distal penile shaft to the proximal glans penis and involving the corona was visualized (Figure 1a and b). Several conditions were considered in the clinical differential diagnosis at the time: candidiasis, condyloma, dermatitis, erythroplasia of Quercet, lichen planus, or Zoon's balanitis.

A biopsy was performed to obtain tissue for microscopic examination. There was a lymphoplasmacytic band-like infiltrate along the dermal-epidermal junction. A periodic-acid Schiff stain failed to identify fungal organisms. Laboratory investigation, including a rapid plasma regain and HIV assay, was negative. Correlation of the patient's history, clinical morphology, pathologic features, and laboratory studies established a diagnosis of balanitis circumscripta plasmacellularis.

The patient had been given mupirocin ointment to apply to the biopsy site three times daily. Treatment options were subsequently discussed with the patient. These included circumcision and topical tacrolimus 0.1% ointment. The patient took several weeks to reach a decision. At his initial follow-up, the lesion had begun to diminish in size. Based on this observation, he elected to continue using mupirocin ointment twice daily with bimonthly follow-up. Complete resolution was noted after three months of therapy (Figure 2a and b). He remained in clinical remission without recurrence two months after mupirocin was discontinued.

DISCUSSION

Since its initial description by Zoon in 1952, balanitis circumscripta plasmacellularis has been a rare benign disease included in the differential of a persistent penile lesion. It mainly affects

FIGURE 1. Distant (A) and near (B) pre-treatment views of the penis after the foreskin has been retracted reveals a 1-cm erythematous, non-tender plaque extending from the distal shaft to the proximal glans involving the corona; microscopic examination of a lesional biopsy showed balanitis circumscripta plasmacellularis.

(A)



(B)



middle-aged to elderly men; patients range in age from 20 to 88. The vast majority of those affected are uncircumcised.¹

Zoon balanitis typically presents as a solitary, well-circumscribed, shiny red-orange plaque on the glans or prepuce. The surface of the plaque may exhibit characteristic small dark red stippling described as "cayenne pepper spots." Most patients are asymptomatic, however mild pruritis or tenderness may occur.² The diagnosis of Zoon balanitis is primarily made based on clinical and pathology findings, however other diagnostic modalities have been researched; Arzberger et al recently demonstrated successful diagnosis of Zoon balanitis and differentiation of it from carcinoma in situ using reflectance confocal microscopy.³

Histopathologic evaluation of the lesion typically reveals a characteristic dense inflammatory infiltrate below the epidermis, predominantly of plasma cells, along with a proliferation of vertically oriented vessels.² Other findings may include atrophy of the epidermis, loss of the rete ridges, and spongiosis. An important distinction is the absence of vesicles and keratinocyte dysplasia.

The differential diagnosis of Zoon balanitis includes erythroplasia of Queyrat, fixed drug eruptions, herpes simplex virus, lichen planus, lichen sclerosis et atrophicus, pemphigus

vulgaris, psoriasis, and secondary syphilis. An analogous lesion affecting females which shares its clinical and histologic features exists, described as vulvitis circumscripta plasmacellularis.⁴ Other analogous lesions have been described in different mucosal sites, most recently in the perianal region⁵; altogether, these lesions comprise a condition known as plasma cell mucositis.

Multiple theories exist regarding the pathogenesis of Zoon balanitis. Mallon et al suggested that Zoon balanitis represented a chronic irritant contact dermatitis, where the presence of foreskin promotes inflammation by a Koebner phenomenon.⁶ Indeed, the fragile skin of the glans is also prone to inflammatory changes from the effect of infectious or exogenous agents. In contrast, Balato et al consider Zoon balanitis as pre-malignant; they observed a man who developed penile carcinoma arising from biopsy confirmed Zoon balanitis.⁷ However, such circumstances are rare. Chronic *Mycobacterium smegmatis* infection, friction, heat, hypospadias, an IgE-antibody mediated response, and lack of hygiene have been proposed as predisposing factors in the development of Zoon balanitis. A T-cell mediated mechanism has also been suggested given the efficacy of treating with calcineurin inhibitors, which act by suppressing T-cell cytokine release and activation.⁸ Our patient's response to topical mupirocin ointment raises the possibility of a bacterial infection or superantigen in the pathogenesis of Zoon balanitis.

FIGURE 2. Distant (A) and near (B) views of the distal penis after 3 months of mupirocin ointment monotherapy shows complete resolution of balanitis circumscripta plasmacellularis.

(A)



(B)



Several treatment options, of ranging success, are available for patients with Zoon balanitis. Observation without therapy rarely results in self-resolution of the lesion. Therefore, most patients elect for treatment due to anxiety and/or cosmetic disfigurement or because of symptoms. Circumcision is considered the gold standard for definitive treatment, and has been shown to protect against common infective and neoplastic penile dermatoses.^{4,6} Recent studies have shown good efficacy using photodynamic therapy, or carbon dioxide laser or erbium:YAG laser.⁹⁻¹¹ However, despite their proven effectiveness, most patients reject these therapeutic options due to the location of the lesion. Nonsurgical approaches for the treatment of Zoon balanitis have also been attempted. Originally, these consisted of topical corticosteroids with or without adjuvant topical antibiotics and/or topical antifungals, however reports of satisfactory treatment with these topical agents were rare.^{12,13}

Topical calcineurin inhibitors, known to be effective in controlling diverse inflammatory mucous membrane and genital diseases, were initially documented as a possible treatment option in 2004.¹⁴ Subsequently, multiple studies using tacrolimus and pimecrolimus have demonstrated good efficacy of treatment with few side effects.¹⁵⁻¹⁶ Hence, topical calcineurin inhibitors have become more widely accepted as an initial medical therapy for Zoon balanitis.

Mupirocin is an antibiotic isolated from *Pseudomonas fluorescens*.¹⁷ It acts by reversibly binding to the enzyme isoleucyl t-RNA synthetase, and thereby inhibits protein synthesis.¹⁸ Mupirocin is commonly used in the treatment of bacterial skin infections such as impetigo, as well as methicillin-resistant staphylococcus aureus (MRSA) infections. To our knowledge, the reported patient represents the first successful treatment of Zoon balanitis with mupirocin monotherapy. Our findings are limited to a single patient. His complete response to mupirocin monotherapy could suggest that, in some patients with Zoon balanitis, there may be a bacterial component involved in the pathogenesis of the disease. The excellent safety profile of mupirocin also might prompt clinicians to consider this as a first-line topical therapy in patients with newly diagnosed Zoon balanitis.

CONCLUSION

Zoon balanitis is a benign inflammatory condition of the penis with an unknown pathogenesis. Current treatment options primarily include either circumcision, or topical calcineurin inhibitors. We report a man with biopsy confirmed balanitis circumspecta plasmacellularis that was successfully treated with mupirocin monotherapy, a treatment modality that has not been previously evaluated. Our findings not only prompt us to recommend future investigations regarding the efficacy of mupirocin monotherapy in a larger number of Zoon balanitis patients, but also to speculate that in some individuals a

bacterial etiology may contribute to the pathogenesis of balanitis circumspecta plasmacellularis

DISCLOSURES

The authors have nothing to disclose, including any affiliation with or financial involvement in any organization or entity with a direct financial interest in the subject matter or materials discussed in the manuscript (eg, employment, consultancies, stock ownership, honoraria, expert testimony).

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