

Bowen's Disease of the Glans Penis (Erythroplasia of Queyrat) in Plasma Cell Balanitis

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We report a case of a persistent penile plaque on the glans penis of allegedly more than 20 years' duration, which was refractory to circumcision and local treatment. Over the years, the patient repeatedly presented with a circumscribed inflammatory lesion of the glans penis, diagnosed as Zoon's balanitis on the basis of clinical aspects and two biopsies. Because of unresponsiveness of the lesion to circumcision and focal steroid infiltration, repeated biopsies were performed in an attempt to rule out malignancy. Two further biopsies were carried out. One again showed the features of a plasmacellular inflammation, while the other finally revealed the histopathologic features of erythroplasia of Queyrat (carcinoma in situ or Bowen's disease of the glans penis). We assume that either the former biopsy specimens were taken from a plasma cell-rich reactive infiltrate around the neoplastic lesion, or that carcinoma in situ may have arisen due to the chronic inflammation of Zoon's balanitis plasmacellularis. Radiotherapy was performed with good clinical response and subsequent histopathologic proof of complete remission of the lesion.

In 1952, Zoon¹ described eight cases of chronic balanitis. All had been clinically diagnosed as erythroplasia of Queyrat, but the histologic characteristics were a distinctive inflammatory infiltrate composed predominantly of plasma cells in the absence of the histologic features of a carcinoma *in situ*. He termed the condition balanoposthitis chronica circumscripta benigna plasmacellularis and defined



FIGURE 1. Well-defined, infiltrated, erythematous plaques of the glans penis refractory to circumcision and intralesional corticosteroids.

this entity according to its differentiation from erythroplasia of Queyrat.

It is a condition presenting in middle-aged or elderly men with characteristic clinical features. The lesion consists of circumscribed shiny plaques on the glans penis with a slightly moist surface stippled with minute red specks: the so-called “cayenne pepper spots.”

On clinical evaluation, plasma cell balanitis is most commonly confused with Bowen's disease of the glans penis, which, mainly for historical reasons, is also referred to as erythroplasia of Queyrat.^{2,3} A dis-

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FIGURE 2. Histologic specimen of plasma cell balanitis. A dense infiltrate is composed of numerous plasma cells (H&E; original magnification, $\times 125$).

tinct differentiation and diagnosis are made by histologic investigation and are mandatory, since Zoon's balanitis is benign and usually responds to circumcision. This is in contrast to erythroplasia of Queyrat,⁴ which represents a carcinoma *in situ* of the glans penis with its prognostic implications. Progression into an invasive squamous cell carcinoma is reported in up to 30% of cases.⁵

Case Report

A 69-year-old white man was first seen presenting with a well-defined, infiltrated, erythematous plaque (3 $\times$ 2 cm) on the glans penis (Figure 1). He allegedly had a history of chronic balanitis for more than 20 years. Fifteen years earlier, he underwent hemircumcision. Examination of an external biopsy specimen in 1989 led to the diagnosis of a "balanitis chronica circumscripta plasmacellularis Zoon." The lesions persisted despite total circumcision 13 years later and local treatment with steroid ointments and topical nystatin. Following his admission to our clinic, we performed a second biopsy and confirmed the diag-

nosis of a plasma cell balanitis on the basis of the histopathologic findings of focal parakeratosis, slight acanthosis, and spongiosis with lack of atypical keratinocytes and a dense plasmacellular infiltrate (Figure 2). Despite the extraordinary massive plasmacellular infiltrate and the lack of any typical epidermal changes (especially an atrophy), the diagnosis of plasma cell balanitis Zoon appeared most pertinent. On physical examination, there were no signs of enlarged inguinal lymph nodes. Intralesional steroid injections with 40 mg triamcinolone acetonide still did not lead to improvement of the lesions, and therefore a third biopsy was performed 4 months after he presented to us. On step sectioning, this revealed the typical features of erythroplasia of Queyrat (Figure 3), consisting of acanthotic epidermis, numerous atypical keratinocytes, mitoses at different levels, multinucleate and dyskeratotic keratinocytes, and a subepidermal infiltrate of inflammatory cells, consisting mainly of plasma cells. Subsequent radiotherapy (20 kV, 10 $\times$ 400 cGy, twice a week) led to disappearance of the skin lesions, leaving a slight epidermal atrophy (Figure 4).

Comments

Plasma cell balanitis is an important differential diagnosis of persisting, circumscribed, inflammatory lesions of the glans penis.⁶⁻⁸ It presents as an indolent, well-defined, shiny glazed, orange-red, macular, erythematous lesion on the glans penis and less frequently on the adjacent prepuce.⁹⁻¹² Close examination may reveal tiny, brighter, "cayenne pepper" spots throughout the plaque. Equivalent lesions have been described on the female genitalia,¹³⁻¹⁵ oral mucosa,¹⁶ and lips.¹⁷

The cause of plasma cell balanitis is unknown. Chronic infection with *Mycobacterium smegmatis* has been postulated and seems the most likely. Predisposing factors may include occlusion, constant friction, and poor hygiene.¹⁸ Some patients are satisfied with symptomatic relief offered by long-term treatment with topical steroids. However, the lesion is typically unresponsive to topical therapy. Circumcision is usually curative.¹⁹ On clinical examination, plasma cell balanitis is most commonly confused with erythroplasia of Queyrat or squamous cell carcinoma *in situ* (Bowen's disease) of the glans penis. The latter has a more red, velvety, and granular appearance but can only be differentiated with confidence by histopathologic evaluation. Other conditions that may pose diagnostic difficulties include fixed drug eruption, psoriasis, lichen planus, and candidiasis.⁸

The only method for establishing a definitive diagnosis of plasma cell balanitis and for differentiating it from erythroplasia of Queyrat and other persistent

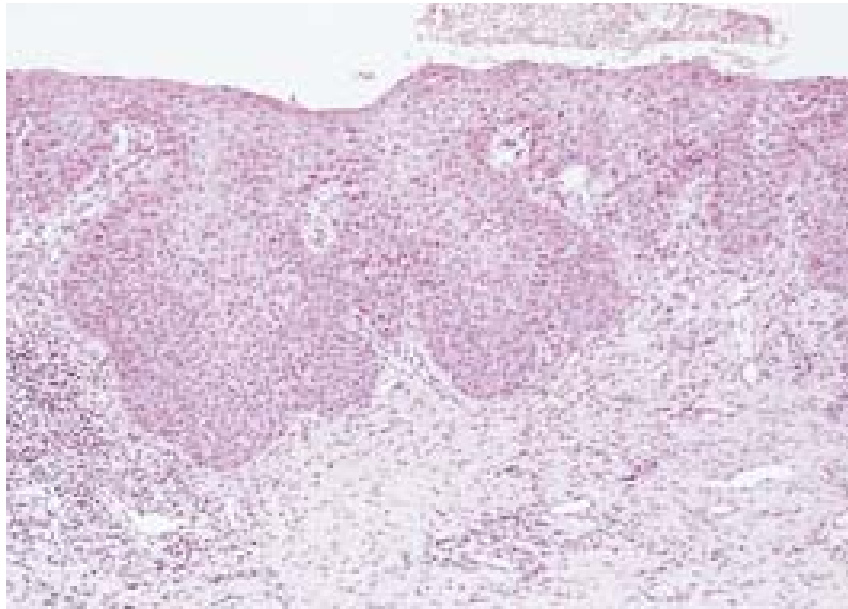


FIGURE 3. Histologic features of erythroplasia of Queyrat. Acanthotic epidermis with mitoses is visible at different levels of the epidermis, as well as large and hyperchromatic nuclei of keratinocytes, and a subepidermal dense infiltrate of lymphocytes (H&E; original magnification, $\times 100$).

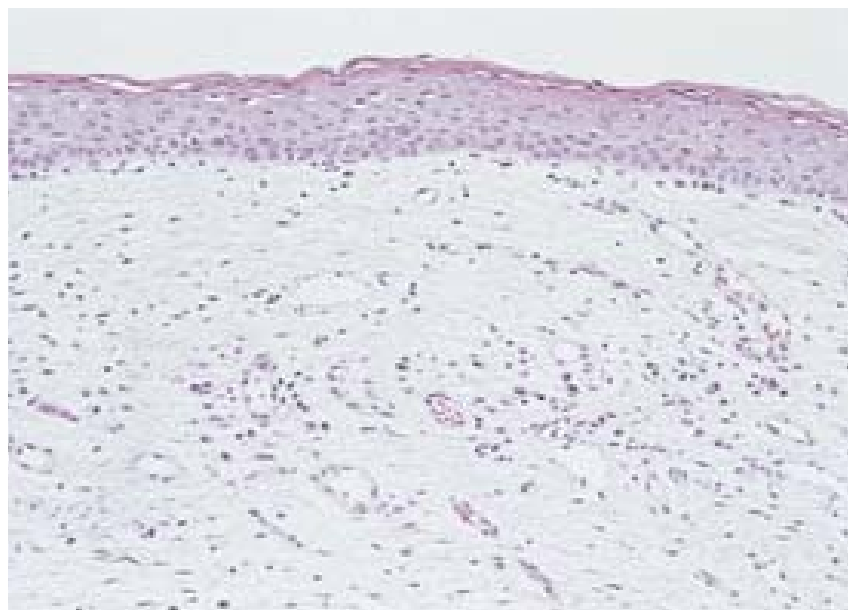


FIGURE 4. Biopsy proof of complete resolution of erythroplasia of Queyrat after radiation therapy with 4000 cGy soft X-ray (H&E; original magnification, $\times 160$).

penile plaques is by histopathologic examination,⁸ since its histopathologic features are distinctive. Zoon's balanitis is characterized by epidermal atrophy, spongiosis, loss of rete ridge pattern, and vascular proliferation. Hemosiderin deposits may be present. The upper dermis shows a band-like inflammatory infiltrate, composed primarily of plasma cells, but lymphocytes, histiocytes, and mast cells may also be seen. Immunohistochemical studies have demonstrated that the plasma cells are polyclonal.^{20,21} This finding is most consistent with a persistent exogenous source of stimulation as a cause of the condition, such as chronic infection. In contrast to Zoon's balanitis, erythroplasia of Queyrat exhibits histopathologic

changes of a carcinoma *in situ*: atypical, dyskeratotic, and necrotic keratinocytes and mitotic figures throughout the entire thickness of the epidermis. A mixed dermal inflammatory infiltrate is present, but plasma cells are usually few in number.

In our patient, the penile lesion had persisted for many years. Initial histopathologic examinations revealed no signs of erythroplasia but were consistent with the diagnosis of Zoon's balanitis. The biopsy specimen demonstrated parakeratosis, acanthosis, lack of atypical keratinocytes, and a dense inflammatory infiltrate subepidermally consisting of numerous plasma cells. Despite the extraordinary dense plasma cellular infiltrate and the lack of the typical epidermal changes, particu-

larly epidermal atrophy, the specimens were interpreted as evidence of Zoon's balanitis. The persistent and refractory course of disease prompted us to perform repeated biopsies, including step sectioning, until the anticipated differential diagnosis of carcinoma *in situ* (erythroplasia of Queyrat) could eventually be made.

In analyzing this case retrospectively, we assume that at least some of the former biopsy specimens may have been taken from the probably reactive inflammatory surroundings rather than from the primary neoplastic lesion itself, therefore leading to the mistaken diagnosis of plasma cell balanitis. As an alternative, a carcinoma could have arisen on the basis of the chronic inflammatory irritation. There are few reports in the literature of development of squamous cell carcinoma in patients with chronic balanitis.^{22,23} However, to our knowledge, there is so far no such report in patients with plasma cell balanitis Zoon. Our observation stresses the importance of repeated biopsies in any case of persistent and refractory balanitis.

We successfully performed local soft X-ray radiation therapy with 20 kV, 10 × 400 cGy twice a week. Recent histopathologic examination demonstrated the absence of any residue of erythroplasia. The chronic plasma-cell-rich inflammatory infiltrate resolved, leaving an area of slight epidermal atrophy at its former site. Long-term clinical follow-up of these cases is essential, irrespective of the mode of therapy used.

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