Plasma Cell Balanitis: Clinicopathologic Study of 112 Cases and Treatment Modalities

Bhushan Kumar, Tarun Narang, Bishan Dass Radotra, and Somesh Gupta

Background: **Plasma cell balanitis or Zoon's balanitis is an idiopathic benign condition of the genitalia that mostly presents as a solitary, persistent plaque on the glans primarily in uncircumcised, middle-aged to older men.**

Methods: **One hundred twelve patients with a clinical diagnosis of plasma cell balanitis were studied between January 1985 and April 2003.**

Results: **The age of the patients ranged from 24 to 70 years. The majority of patients had symptoms for more than 12 months. Lesions involved the prepuce and glans in the majority of patients (66; 58.92%), the prepuce only in 26 patients (23.21%), and the glans only in 20 patients (17.85%). Tissue for histopathology was available in 96 patients. Histologically, epidermal edema, a dense upper dermal band of chronic inflammatory cells, including many plasma cells, dilated capillaries, extravasated red blood cells, and hemosiderin deposition, was seen. In most, cases, plasma cell balanitis was successfully treated by circumcision.**

Conclusions: **This report describes our experience with plasma cell balanitis and reviews its clinical and histopathologic aspects. The treatment modalities are also reviewed, and the importance of circumcision as the treatment of choice is emphasized.**

Antécédents: **La balanite à plasmocytes ou balanite de Zoon est une condition idiopathique bénigne des organes génitaux qui se présente souvent sous forme de plaque solitaire persistante sur le gland d'hommes d'âge moyen à avancé qui ne sont pas circoncis.**

Méthodes: **On a étudié le cas de 112 patients ayant reçu un diagnostic de balanite à plasmocytes entre janvier 1985 et avril 2003.**

Résultats: **Les patients étaient âgés de 24 à 70 ans. La majorité avait des symptômes pendant plus de 12 mois. Les lésions touchaient le prépuce et le gland chez la plupart des patients, soit 66 patients (58,92 %), le prépuce seul chez 26 patients (23,21 %), et le gland seul chez 20 patients (17,85 %). On a pu récupérer du tissu pour l'histopathologie chez 96 patients. L'examen histologique a révélé un œdème épidermique, une bande épaisse supérieure formée de cellules inflammatoires chroniques, notamment d'un grand nombre de plasmocytes, des capillaires dilatés, des globules rouges extravasés ainsi que des dépôts d'hémosidérine. Dans la plupart des cas, la balanite à plasmocytes a été traitée grâce à une circoncision.**

Conclusions: **Ce rapport décrit notre expérience avec la balanite à plasmocytes et donne un aperçu de ses aspects cliniques et histopathologiques. Les modalités de traitement ont été revues et l'importance de la circoncision comme traitement de choix a été soulignée.**

PLASMA CELL BALANITIS (PCB) or balanitis circumscripta plasmacellularis is a benign, idiopathic condition first recognized by Zoon in 1952.[1] PCB typically presents as a solitary, smooth, shiny, red-orange plaque of the glans and prepuce of uncircumcised, middle-aged to older men.[2–4] The disease tends to be chronic and may persist for months to years. The characteristic histologic features are a band-like inflammatory infiltrate that is mainly plasmacytic in the upper dermis, dilated capillaries, and deposition of hemosiderin. Topical pharmacotherapy is useful in the early stages to reduce the initial symptoms and slow down the progression but is not effective in all cases and is not curative. Circumcision, which was advocated as the best modality of treatment many decades ago,[5] still remains the preferred treatment.[6–9] This report describes our experience with PCB and reviews its clinicopathologic aspects and treatment modalities.

Patients and Methods

Patients attending the sexually transmitted disease clinic at our center between January 1985 and April 2003 who fulfilled the clinical criteria of PCB (Table 1) were included

From the Department of Dermatology, Venereology and Leprology and the Department of Pathology, Postgraduate Institute of Medical Education and Research, Chandigarh, India.

Address reprint requests to: Bhushan Kumar, MD, MNAMS, Department of Dermatology, Venereology and Leprology, PGIMER, Chandigarh 160 012, India; E-mail: kumarbhushan@hotmail.com.

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Table 1. Clinical Criteria for Diagnosing Plasma Cell Balanitis*

Shiny, erythematous patches on the glans, prepuce, or both
Lesions present for > 3 mo
Absence of lesions suggestive of LP; psoriasis elsewhere on the body
Poor response to topical therapies (minimum 4 wk)
Absence of concurrent infections (ruled out after doing laboratory tests: Tzanck, potassium hydroxide, Gram stain, and VDRL tests)

LP = lichen planus; VDRL = Veneral Disease Research Laboratory.
*Three-fifths should be present to label the patient as having plasma cell balanitis.

Figure 2. Well-circumscribed orange-red glazed areas on the glans with multiple pinpoint redder spots (“cayenne pepper spots”).

in this study. One hundred twelve uncircumcised men presented with shiny, reddish, macular or minimally infiltrated lesions on the glans penis, prepuce, or both. All of them had received at least one of the topical treatments, steroids, antifungal agents, and combinations of steroids with antifungal or antibacterial agents, in the past.

Biopsy material or circumcised tissue was available for histopathologic evaluation from 96 patients. In addition to routine staining with hematoxylin and eosin, Pearl's stain was used to detect hemosiderin. VDRL (Veneral Disease Research Laboratory), human immunodeficiency virus (HIV), and relevant investigations to rule out any sexually transmitted infection were done in all patients. Eighty-five patients underwent circumcision.

Results

One hundred twelve of 1,923 male patients attending the sexually transmitted disease clinic had PCB (5.82%). The clinical (Figures 1 and 2) and demographic details of the patients are given in Table 2.

Figure 1. Solitary, smooth, shiny, red-orange plaque on the glans.

The histologic features observed were variable (Table 3), but attenuated thickness of the epidermis, loss of rete ridges, dense dermal infiltrate composed predominantly of plasma cells, and scattered lymphocytes were observed in all patients. The dermal blood vessels oriented vertically with extravasation of erythrocytes was the other common feature observed (Figures 3 and 4). Hemosiderin deposits were present in only five specimens (Figure 5). Seventy-five patients fulfilled the histopathologic criteria of PCB. In the remaining patients, lichen sclerosus, lichen planus, and nonspecific balanitis were diagnosed in 6, 3, and 12 patients, respectively.

Eighty-five patients underwent circumcision. The patients were observed until the lesions resolved (3–12 weeks). No recurrences were noticed in any of the circumcised men followed up for a period ranging from 3 months to 5 years. Pigmentation and scarring were observed in 19 patients, who had presented after 5 years of onset of disease.

Among the other 27 patients who refused circumcision, other topical therapies in the form of steroids, steroid-antifungal/antibacterial combinations, and tacrolimus were

Table 2. Clinical Profile of Patients

Clinical Profile	*No. of Years/Patients*
Age	24–70 yr
Duration	3 mo–25 yr
Symptoms, *n* (%)	
Burning/pruritus	14 (13)
Discharge	17 (15)
None	81 (72)
Location, *n* (%)	
Glans	20 (18)
Prepuce	26 (23)
Both	66 (59)

Table 3. Histopathologic Features Observed in the Study

Change	n
Epidermal	
Atrophy	84
Acanthosis	10
Watery spongiosis*	80
Lozenge keratinocytes*	78
Hydropic degeneration of basal cells	9
Dermal	
Dense plasmacytic infiltrate (plasma cells > 50%)*	78
Mixed infiltrate	18
Vascular proliferation*	75
Vertical orientation of dermal vessels*	76
Hemosiderin deposition	5
Homogenization of collagen	6
Fibrosis	10
Vascular dilatation	11
Atypical cells/dysplasia	0

*Criteria used for the diagnosis of plasma cell balanitis (three-fifths should be present).

prescribed. Most of the patients responded favorably to these therapies initially, with the lesions showing signs of healing in 22 (81.48%) within 2 to 3 months of therapy. Details of follow-up are shown in Table 4.

Discussion

Long-lasting erythematous lesions involving the balanopreputial sac may be clinically difficult to classify, and biopsies may have to be performed to clarify the nature of the disease. PCB is an important part of the differential

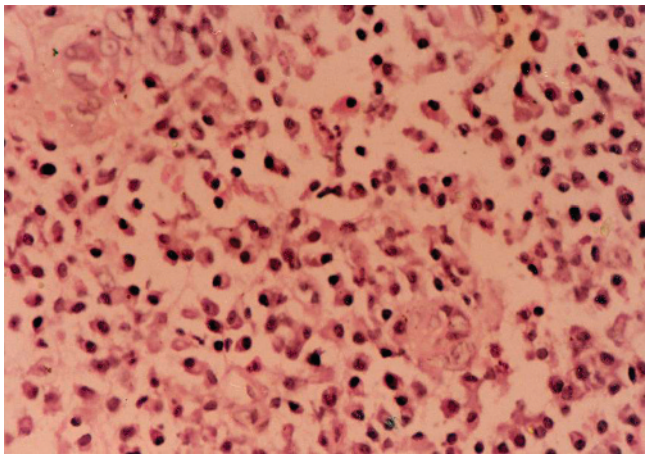

Figure 4. Plasma cell–rich infiltrate in the same section as in Figure 3 (hematoxylin-eosin stain; ×540 original magnification).

diagnosis of circumscribed lesions of the glans penis. It needs to be differentiated from erythroplasia of Queyrat, fixed drug eruption, psoriasis, lichen planus, seborrheic dermatitis, secondary syphilis, candidiasis, and Reiter's syndrome. The classic feature of PCB is a shiny, glazed, reddish macular erythematous lesion with multiple pinpoint bright red spots (cayenne pepper spots) on the glans penis, prepuce, or both in middle-aged or elderly men.[2,3] Vegetative, erosive, and "multiple lesion" variants have also been reported.[4] Lesions analogous to PCB have been reported on the vulva,[10–13] nose, lips, oral cavity, epiglottis, and larynx.[14] PCB tends to be chronic and is often present for months to years before clinical presentation. Symptoms are minimal but may include mild tenderness or pruritus.[15] Most of our patients had involvement of both the glans

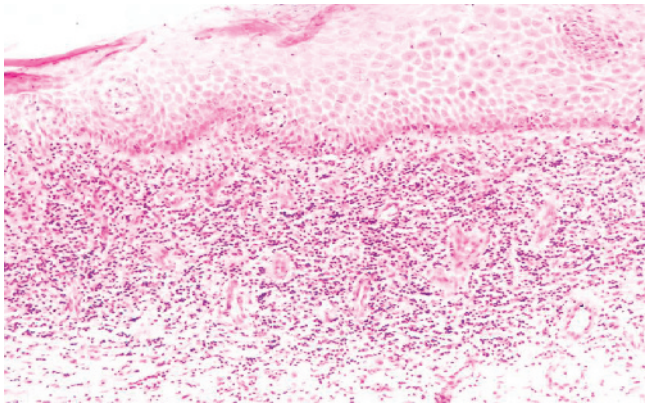

Figure 3. Epidermis showing acanthosis. Dense mononuclear inflammatory infiltrate is seen in the dermis, along with exocytosis (hematoxylin-eosin stain; ×280 original magnification).

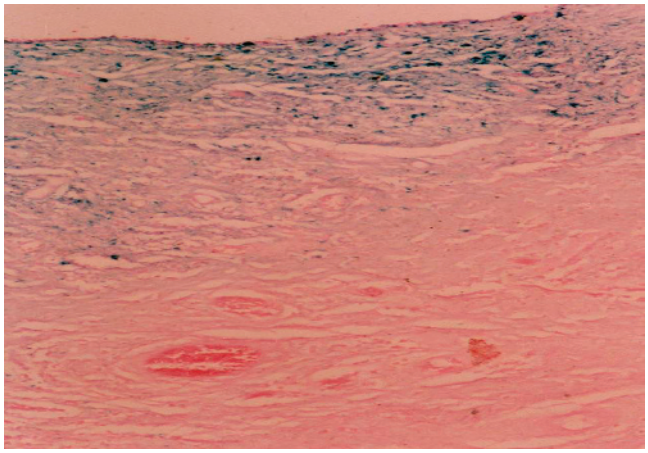

Figure 5. Persian blue stain showing an increase in iron pigment (×280 original magnification).

Table 4. Profile of Patients Who Received Topical Therapies

Variables	*Mometasone*	*Clotrimazole + Beclomethasone*	*Fusidic Acid + Beclomethasone*	*Tacrolimus Ointment 0.1%*
Number of patients	7	7	7	6
Mean duration of therapy (mo)	2.2	3.2	2.2	1.4
Period of remission (mo)	3–6	3–14	5–24	3–12
Number of patients in remission after 5 yr	0	0	2	1

and prepuce (59%) and were asymptomatic (72%) at the time of presentation.

The cause of PCB is unclear. Different etiologies proposed include heat, friction, poor hygiene, chronic infection,[16,17] trauma,[18] immediate hypersensitivity response,[19] and hypospadias.[20] However, the most accepted theory is that PCB is a nonspecific tissue reaction that may occur as an isolated finding or may complicate other diseases affecting the glans penis or prepuce of uncircumcised men.[21] The clearance of lesions after circumcision and occurrence of disease almost exclusively in the uncircumcised men lends support to theories regarding the role of constant friction and probably poor hygiene in its causation.[6,22] All of our patients were uncircumcised. We could not demonstrate any infectious agent(s) that could be considered responsible for the causation or progression of disease.

PCB has a distinctive histologic pattern, which distinguishes it from a clinically similar premalignant condition, erythroplasia of Queyrat. It is characterized by epidermal atrophy, lozenge keratinocytes with watery spongiosis, and a dense lichenoid subepidermal infiltrate composed largely (> 50%) of plasma cells.[23] Erythrocyte extravasation and hemosiderin deposition are often noted.[8] In a study of 45 patients, Weyers and colleagues reported that the earliest histopathologic changes in PCB are slight thickening of the epidermis, parakeratosis, and a patchy lichenoid infiltrate of lymphocytes and some plasma cells.[21] More advanced cases showed atrophy of the epidermis, superficial erosions, a scattering of neutrophils in the upper reaches of the epidermis, scant spongiosis, extravasation of erythrocytes, and a much denser infiltrate with many plasma cells. Additional findings at still later stages are subepidermal clefts, sometimes with loss of the entire epidermis, marked fibrosis of the superficial dermis, and many siderophages. This sequence of histopathologic changes is compatible with the thesis that balanitis of Zoon results from irritation or mild trauma affecting barely keratinized skin in a moist environment.[21]

Seventy-five (78%) patients showed characteristic histologic changes of PCB (see Table 3). There was a subepidermal, plasmacytic, inflammatory infiltrate with proliferation and vertical orientation of dermal vasculature and erythrocyte extravasation in all of our cases, as has been described by most authors. Six specimens showed fibrosis in the superficial dermis in addition to the other characteristic features of PCB. All of these patients had the lesions of PCB for a longer duration (> 5 years). However, hemosiderin deposition, which has been described as one of the characteristic histologic features, was present in only five of our cases. The absence of hemosiderin in most of the sections is difficult to explain, but it may be due to the longer duration of the disease. The positive specimens were from patients with recent lesions who presented within 6 months of the onset of disease.

A number of therapies (medical and surgical) have been tried in patients with PCB. Medical therapies include topical agents such as corticosteroids, antifungals, antibacterials, interferon-α,[24] and hormonal therapy. Surgical modalities include circumcision[5–9] and carbon dioxide laser ablation.[25] Topical treatments may relieve minor symptoms but are generally not curative. In our study, we observed that topical therapies are palliative and not curative as 3 of 22 (14%) patients were in remission for 5 years and 19 of 22 (86%) of the patients relapsed within 2 years of stopping treatment.

Since PCB is an expression of dysfunctional foreskin, circumcision is regarded as the treatment of choice.[5–9] The curative effect of circumcision in 100% of patients suggests that PCB is a relatively nonspecific reactive balanitis caused by a disturbed ''preputial ecology.'' A review of the scientific literature reveals that the actual effect of circumcision is the destruction of the clinically demonstrable hygienic and immunologic properties of the prepuce and intact penis.[6–8,22] Circumcision is a relatively safe procedure but is not embarked on without a trial of medical treatment and previous patient counseling. In our

experience, patient satisfaction with resolution of PCB after circumcision usually outweighs the physical consequences of the procedure.

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