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**Original Research Article**

# A clinico etiological study of balanoposthitisin male patients attending the sexual transmitted diseases outpatient department

**K. Deepa, C. L. Chitra*, R. Manipriya**

Department of Dermatology, Madras Medical College, Chennai, Tamil Nadu, India

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***Correspondence:**
Dr. C. L. Chitra,
E-mail: chitracl@yahoo.com



## ABSTRACT

**Background:** The term balanoposthitis refers to inflammation of the glans and the prepuce. It is a widespread condition in male patients attending the genitor-urinary clinic. It may be acute or chronic, occurring most commonly in the uncircumcised men. The aim of the study was to study the incidence of balanoposthitis in all male, to identify the etiological agents by microbiological investigations and the risk factors and the complications associated with balanoposthitis.
**Methods:** Study group consists of 100 male patients presenting with the complaints of pain, pruritus, fissuring of the prepuce and subpreputial discharge attending the STD department were chosen. The detailed history was taken, and clinical examination was done. The subpreputial discharge was collected, and wet mounts, cultures, and subcultures were done.
**Results:** All the patients in the study group with balanoposthitis were uncircumcised. 55% of the patients had some associated systemic disease. Out of the 55 patients, diabetes was present in 45 patients. Of the 51 patients of diabetics, 77.77% were in the recently diagnosed group within the past 5 years. Phimosis and preputial adhesions were the most common complications. The Sensitivity of the KOH wet mount in detecting yeast cells was around 93%. Candida albicans was grown by 56%. In our study, *S. aureus* (24%) was the most common bacterium isolated.
**Conclusions:** The most common systemic association and the predisposing factor was diabetes mellitus. The infective etiological agents were associated with the majority of balanoposthitis. The most common complication associated with balanoposthitis was phimosis.

**Keywords:** Balanoposthitis, Diabetes mellitus, Candida, Genital hygiene

## INTRODUCTION

Balanoposthitis is inflammation of both glans penis and prepuce. It may be acute or chronic, occurring most commonly in the uncircumcised men. In circumcised men only the glans penis is affected. It may be due to infective or non infective etiology or may be idiopathic. Irritants and allergens can also cause balanoposthitis. Patients complain of pruritus, irritation, or subpreputial discharge. They may present with fissuring of prepuce and erythema of the glans penis. The disease starts with inflammation following break in the continuity of the prepuce. This can also predispose to acquisition of HIV infection. The incidence of balanitis is 3% worldwide.[1] The incidence of balanoposthitis is about 9.6% in a prospective study conducted on 467 male patients attending a STD clinic.[2] The incidence is about 11% of male patients attending the genitourinary clinic.[3] The incidence of balanoposthitis in patients with type 2 diabetes was higher (about 95%) than in patients without diabetes.[4] It was about 95% according

to a study of about 1 lakh male patients referred from General practice research database.[1] Balanoposthitis can be caused by many factors, both infective and non infective. Balanitis is more common in uncircumcised men due to poor hygiene and inadequate aeration or irritation by smegma.[5] Many dermatoses and systemic diseases can cause specific balanitis. We can identify the causative organisms in suspected infective cases by simple outpatient procedures like wet mount normal saline and potassium hydroxide mount and grams stain. The organism can be isolated by micro biological culture wherever possible. Among the infectious causes Candida species being the commonest organisms isolated.[6] Alsterholm et al showed an incidence of 18% of Candida balanoposthitis.[7] Candidal balanoposthitis accounts for about 30% of all cases of infectious balanitis.[8] Diabetes mellitus itself is an independent risk factor for candidal balanitis.

***Aim***

To study the incidence of balanoposthitis in all male, to identify the etiological agents by micro biological investigations and the risk factors and the complications associated with balanoposthitis.

## METHODS

In this study, we intend to ascertain the incidence of balanoposthitis in all male patients. The age distribution and to identify the etiological agents in infective balanoposthitis by microbiological investigations, associated systemic diseases and study the risk factors and the complications related to balanoposthitis in all male patients attending the outpatient department of Venereology, Madras Medical College from March 2012 to 2013 January. Inclusion criteria: Male patients presenting with the complaints of pain, pruritus, fissuring of the prepuce and subpreputial discharge attending the STD department were chosen. The detailed history and clinical examination were done. The subpreputial discharge was collected, and normal saline and KOH wet mount were prepared, and Grams stain and Leishman's stain were done on two more slides. The sample was also collected on three sterile cotton swabs and sent for bacterial, gonococcal and fungal culture.

A detailed history was obtained regarding complaints, duration, systemic illness, usage of any topical or systemic medication and other factors like age, occupation, educational status, socioeconomic status, marital status and sexual history and treatment history, history of external application, history of systemic illness, any history of drug intake and related symptoms. The systemic and genital examination was done. Any erythema, fissuring of the preputial skin, any erosion, whether the prepuce is retractable or not and the nature of the subpreputial discharge were noted.

The subpreputial discharge is smeared on four clean glass slides, and one drop of normal saline and 10% KOH are added to two of them, and the coverslip is placed on them without air bubble. The other two are sent to OPD laboratory, one for Grams stain and another for Leishman's stain. The discharge is taken with three sterile cotton swabs, and one is sent for direct bacterial culture to the microbiology laboratory immediately. The second swab is placed in Amies transport media for gonococcal culture, and the third sent for fungal culture. All participants were tested for VDRL, HIV antibodies, complete blood count, and random blood sugar and also routine urine analysis.

The patients were given appropriate treatment and were asked to come after 10 days for review and re-examined. Those with systemic risk factors like diabetes were referred to the specialist for management of diabetes. The patients who presented with complications like phimosis were referred to the general surgery department for circumcision after controlling the acute inflammation.

Data collected were represented in frequency and percentage.

## RESULTS

The age distribution of the study group shows a greater proportion of the 30-60 years group, which is probably correlated with the sexual activity. All the patients in the study group with balanoposthitis were uncircumcised. Most of the patients in the study group 66% presented for the first time with the symptoms of balanoposthitis. 34% gave the history of previous similar illness.

History of topical application of either some ointment or disinfectant solution was present in 7% of the study group that has resulted in irritantbalanoposthitis. 55% of the patients had some associated systemic disease. Out of the 55 patients, diabetes was present in 45 patients.

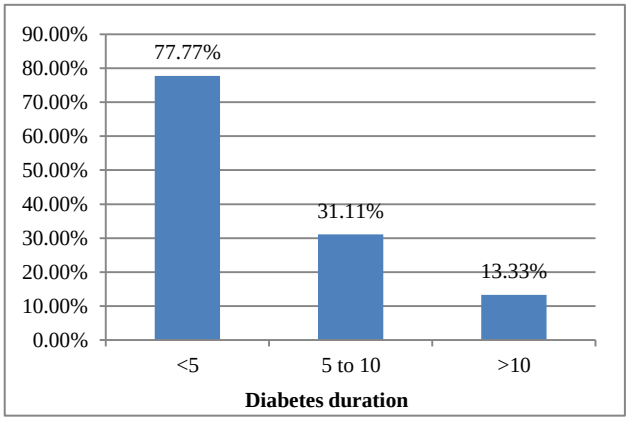


**Figure 1: Association of balanoposthitis with duration of diabetes.**

Of the 51 patients with diabetes, 77.77% were in the recently diagnosed group within the past 5 years, 31.11% in the 5-10 year group and 13.33% of patients belonged to the long duration of diabetes >10 years. All the patients enrolled in the study were heterosexuals. No homosexuals were encountered in our study (Figure 1).

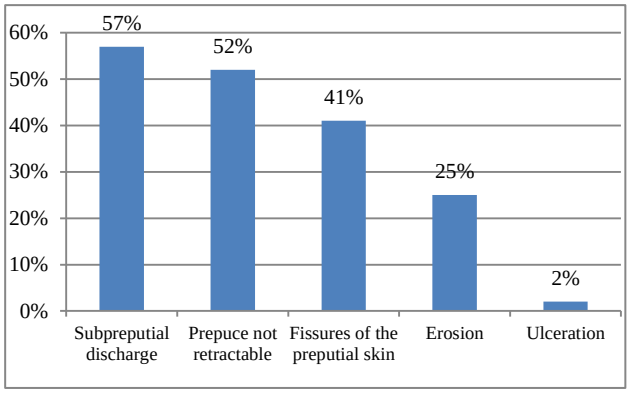


**Figure 2: Clinical presentations in the study group.**

57% of the study group complained of thick whitish subpreputial discharge, 52% presented with either inability to retract the prepuce or difficulty interacting, 41% had fissures of the preputial skin, and 25% of the study group complained of erosion, and 2% had ulceration. The most frequent presentation is subpreputial discharge (Figure 2).

Only four patients were associated with sexually transmitted diseases like HIV (3%), herpes (2%), and HPV (2%). Two of the seropositive were already on ART and known diabetics on treatment. One of them also had herpes simplex and painful erosive balanitis, which was treated with acyclovir 400 mg three times daily. Other patient presented with HPV balanitis and found to be seropositive for HIV.

**Table 1: The frequency of the risk factors in patients with balanoposthitis.**

| Risk factors | Number of cases | Percentage (%) |
|---|---|---|
| **Diabetes** | 45 | 81.80 |
| **Hypertension** | 3 | 5.45 |
| **HIV on ART** | 3 | 5.45 |
| **Nephrotic syndrome** | 1 | 1.81 |
| **Reiters syndrome** | 1 | 1.81 |
| **Steven-Johnson syndrome** | 1 | 1.81 |
| **Radiotherapy sequelae - Ca rectum** | 1 | 1.81 |

Balanoposthitis is associated with dermatological conditions in 9%of the study group. They were mucosal vitiligo 2%, psoriasis 1%, Steven Johnson syndrome 1%, fixed drug eruption 2%, Reiters syndrome 1%, lichen sclerosus 1% and balanitis xerotica obliterans 1% (Table 1).

HIV was found in 3% of the study group. Tzanck smear results showed multinucleated giant cells in 2% of the study group. The subpreputial discharge showed budding yeast cells in only 3% with the normal saline wet mount but in 44% with 10% KOH solution. The Sensitivity of the KOH wet mount in detecting yeast cells was around 93%.

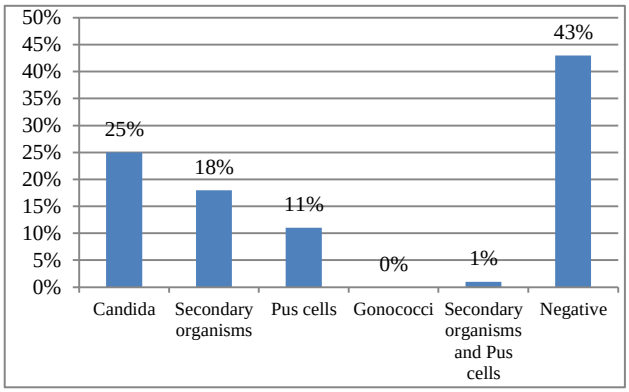


**Figure 3: Gram stain results of subpreputial discharge.**

Gram stain results of subpreputial discharge showed *Candida* 25%, Secondary Organisms 18%, Pus Cells 11%, *Gonococci* 0% Secondary Organisms and Pus Cells 1%, and nothing were detected in 43% of the group (Figure 3).

**Figure 4: Picture of candidal balanoposthitis.**

*Candida albicans* was the only species grown on sub culturing in HI CHROME agar media. All the patients of candidal balanoposthitis in the study group were caused by *Candida albicans*. *Candida albicans* was isolated in 56 patients of balanoposthitis (Figure 4).

Of the 100 patients enrolled 51% were diabetics. 54.9% (28) of them presented for the first time with balanoposthitis. 45.09% (23) of them gave the history of recurrence of balanoposthitis. High urine sugar positivity was seen in 47.06% (24). Uncontrolled blood sugar >200 mg/dl was seen in 64.71% (34). Fungal culture in 51

patients showed no growth in 27.45% (14) patients, and *Candida albicans* was grown in 72.54% (37) of patients.

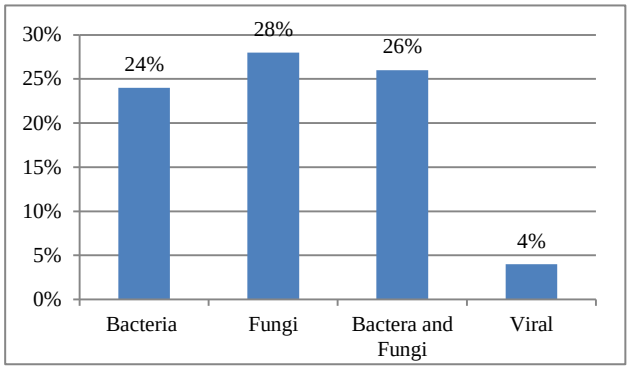


**Figure 5: Percentage of infectious aetiology.**

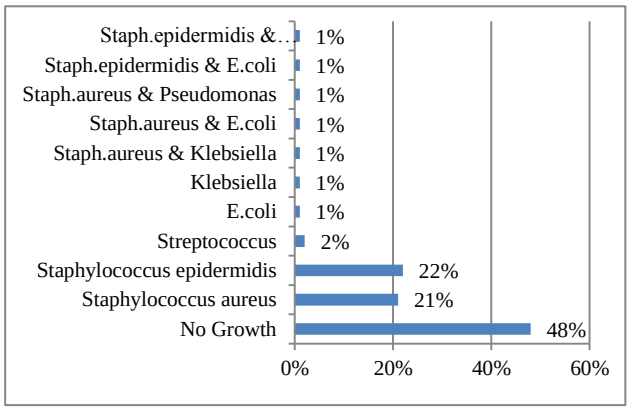


**Figure 6: Isolates of the bacterial culture.**

Bacteria only were isolated in 24%, fungi only in 28%, bacteria and fungi in 26%, and viral etiology accounted for 4% of the infective cases of balanoposthitis (Figure 5 and 6).

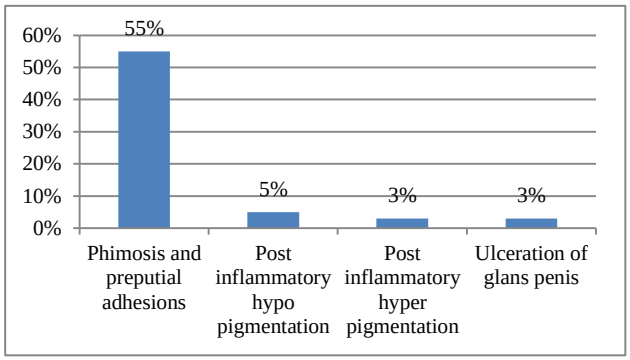


**Figure 7: Frequency of complications.**

Phimosis and preputial adhesions 55%, post inflammatory hypo pigmentation 5% post-inflammatory hyper pigmentation 3%, ulceration of glans penis-3% were the complications noted. Of the 54 patients with phimosis, 30 patients had diabetes, and 24 had no diabetes. Of the 30 patients with DM and phimosis, nearly, 70% of them were recently diagnosed with their diabetic status (Figure 7 and 8).

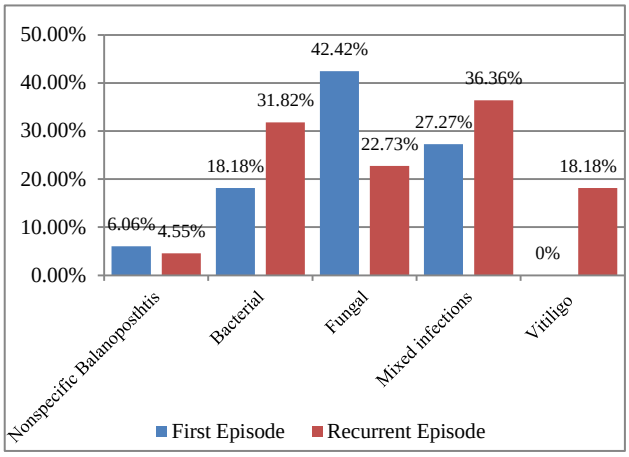


**Figure 8: Percentage of etiology in phimosis in different episode.**

## DISCUSSION

Balanoposthitis is one of the commonest diseases in male patients attending STD department. The incidence of balanoposthitis is 3% and 11% in those attending male genitourinary clinic worldwide.[1,3]

The incidence of balanoposthitis is higher in diabetics than in those without diabetes. In our study, the incidence of balanoposthitis was found to be approximately 3.6% among our STD outpatients. In our study all the patients were uncircumcised. The similar observation was made in the study by Lisboa et al of 118 patients of balanoposthitis.[9] This shows the important role played by the presence of the prepuce in causing balanoposthitis. The skin fold formed by the prepuce carries microorganisms and results in maceration due to an accumulation of epithelial debris and glandular secretions. Presence of tight prepuce, subclinical carriage of organisms, maceration, and poor hygiene are the contributing factors in the pathogenesis of balanoposthitis.

Cutaneous infections like HSV, HPV, and Candida were also more common in uncircumcised men.[3] In our study, 84% of the patients were married, and all of them were heterosexuals. This is similar to the observation by Lisboa et al where 67% of them were married, and 96% were heterosexual.[6] This indicates that one of the factors contributing to the initiation of the disease or aggravation of the disease may be sexual activity apart from other factors.

The most common symptoms and signs were subpreputial discharge followed by phimosis and fissures in the prepuce in our study. According to Lisboa et al burning, prurituses, erythema of the glans and prepuce and subpreputial discharge were the most common complaints.[9] Soreness, itch, inability to retract the

prepuce and subpreputial discharge were the presenting symptoms and erythema, ulceration and exudates were the clinical features noted by Rajiah et al.[1]

Wet mount with normal saline showed budding yeast cells in 3% of patients and 10% KOH in 44% of patients. *Candida* was grown in 56% of patients on culture. The sensitivity of normal saline wet mount in detecting *Candida* was 67% compared to culture. The sensitivity of 10% KOH in detecting *Candida* was 93% compared to culture.

Gram stain showed budding yeast cells in 25% of patients, secondary organisms in 19% of patients and pus cells in 12% of patients (Figure 6). The sensitivity of grams stain in detecting *Candida* was 96.3% compared to culture.

In our study, we were able to isolate bacteria in 52% of patients and fungi in 56% of patients (Figure 7). Both bacteria and fungi were present in 26% of patients. Among the bacteria most common was *S. aureus* (24%), and coagulase negative *Staphylococcus* (24%), *E. coli* and *Klebsiella* were isolated in 3% of patients, *Streptococci* in 2% and *Pseudomonas* in 1% patient. Mixed infections were also present in some of them.

Alsterholm et al claimed that *Staphylococcus aureus* was responsible for 19% of patients and observed that it was more frequently isolated in atopic individuals than in others.[7] The presence of *S. aureus* itself can increase the irritation and inflammation and induce balanoposthitis just as in atopic dermatitis.

Candidal balanoposthitis was the commonest cause of infectious etiology accounting to 30-35% and 34.7%.[6,8] In our study, Candidal balanoposthitis was about 56% and *C. albicans* was the only species of Candida which was grown on chrome agar media in all the patients. It is similar to the study by Lisboa et al and Jacqueline in which *Candida albicans* was the most common species among the various *Candida* species found in 76-89%, followed by *Candida glabrata* and others.[10,7] But *C. glabrata* was the more frequent species isolated according to Franscia et al.[11]

Phimosis, meatal stenosis and malignant transformation were the complications noted by Rajiah et al.[1] Phimosis was associated with diabetes in 55.56% of our patients, and 70% of them were recently diagnosed diabetics (Figure 8). This may be because of hyperglycemia, or frequent fluctuations in the blood sugar level.

## CONCLUSION

The most common systemic association and the predisposing factor was diabetes mellitus. The infective etiological agents were associated with the majority of balanoposthitis. The most common complication associated with balanoposthitis was phimosis. Poorer the glycemic control, the more severe the symptoms and signs of balanoposthitis and also higher the occurrence of complications. Good glycemic control and adherence to genital hygiene help to reduce the number and severity of recurrences.

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*Ethical approval: The study was approved by the institutional ethics committee*

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