



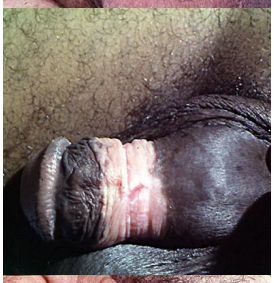
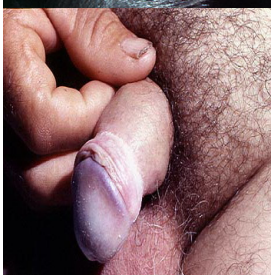

Balanoposthitis

Defined as the inflammation of the foreskin and glans in uncircumcised males, balanoposthitis occurs over a wide age range and may have any of multiple bacterial or fungal origins or be caused by contact dermatitides. Complex infections have been well documented, often from a poorly retractile foreskin and poor hygiene that leads to colonization and overgrowth. Treatment focuses on clearing the acute infection and preventing recurrent inflammation/infection through improved hygiene. Although not as necessary as in the past, circumcision may be considered for refractory or recurrent balanoposthitis. Balanoposthitis should not be confused with balanitis, which is inflammation of the glans penis or the clitoris.

Pathophysiology

Although multiple organisms have been incriminated as causative agents, the patient is empirically treated without obtaining specific organism etiology in most cases. The multicausal origin of balanoposthitis has been emphasized by Fornasa et al, who identified infectious, mechanical/traumatic, or contact dermatitides in 67% of their patients with balanoposthitis.[1] In

one third of the patients, a specific cause could not be established even after clinical examination and microbiologic and serologic tests had been performed. Candidal infection appears to be the most common cause of disease. Older men often have other etiologies, including intertrigo, irritant dermatitides, or other fungal infections. Organisms that have been identified include
Bacteroides, Gardnerella,
[2,3]
and
Candida
species and beta-hemolytic streptococci.

Mayser has proposed that candidal balanitis/balanoposthitis is the most frequent mycotic infection of the penis,[4] although, in general, fungal infections of the penis are rare. In one series, *Candida* species accounted for 30% of the causative organisms, and beta-hemolytic streptococci accounted for 13%. Wakatsuki detected the following infectious agents as a cause: *Candida* species in 50%, *Streptococcus* species in 25%, and no growth in 13% (12% were not tested).
[5]

Rare causes include *Streptococcus pyogenes,*[6] *Prevotella melaninogenica, Cordylobia anthropophaga,* [7] *Providencia stuartii,* and *Pseu domonas aeruginosa,*
the last 2 in individuals who are immunocompromised. Reports of an association between human papillomavirus (HPV) infection and long-standing balanoposthitis have been published, but they may reflect a noncausative association.
[8,9,10]
Associations with ulcerative colitis
[11]
and Crohn disease
[12]
have also been noted. A case of granulomatous balanoposthitis after intravesical BCG vaccine instillation therapy has been published.
[13]

History

In adults, a detailed clinical history focusing on topical irritants and home remedies assists in making the correct diagnosis and in detecting possible contact dermatitides.

Physical

- Examination of the glans and the prepuce often reveals a red, moist macular lesion.
- Associated erythema is noted, and areas of yellow-to-black discoloration have been described. [19]
- The presence of lichenification, irregular borders, or acetowhite changes with 5% acetic acid treatment suggest an HPV infection, which can be seen in association with balanoposthitis.

- A superimposed balanoposthitis on a flat condyloma has been described. Such coexisting lesions may be diagnosed based on the clinical history and a culture of fungus or bacteria from the ulcer.
- Ulceration and deep erosion have been seen in patients with advanced disease, often in association with fungal infections and in individuals who are immunocompromised.

Causes

In a study conducted by Alsterholm et al, patients with balanoposthitis had a significantly higher frequency of positive cultures than in the control group (59% and 35%, respectively, *P* <.05). [20]

In the balanoposthitis group, *Staphylococcus aureus* was found in 19%, group B streptococci in 9%, *Candida albicans* in 18%, and *Malassezia* in 23% of patients. In the control group, *S aureus* was not found at all, whereas *C albicans* was found in 7.7% and *Malassezia* in 23% of patients. Different microbes did not correspond with distinct clinical manifestations.

Although not shown to be a direct cause, an association exists between nonspecific balanoposthitis and the uncircumcised penis. Mallon et al have proposed that circumcision may protect against balanoposthitis and common penile infections.[21] Rare causes include a contact-induced balanoposthitis from the application of celandine juice (from the plant *Chelidonium majus*). An association with preputial smegma stones has been described, a correlation that most likely reflects the hygiene of the affected population

Other Problems to Be Considered

Candidal, viral, or fungal infections
Zoon balanitis (balanitis circumscripta plasma cellularis)
Ulcerating lesions of the penis (may result from bites with subsequent infection by oral flora)
HPV infection, in particular flat condylomas[23]
Amebiasis (rare; usually in homosexual men; suspect in patients with poor response to antibiotics)[24]
Trophozoites (examination is confirmatory)
Pilonidal sinus of the penis (rare; presenting at the coronal sulcus)[25]

Laboratory Studies

- Potassium hydroxide (KOH) slide preparation and culture for *Candida* species
- A KOH preparation allows for the rapid visualization of the candidal hyphae.
- Culture often isolates candidal species in these cases and helps to direct proper treatment.

Imaging Studies

- No imaging studies are indicated.

Other Tests

- Rarely, serologic tests for candidal species may be indicated, particularly in unclear cases and for academic interest.

Procedures

- Biopsy from the involved area
- Biopsy is performed in doubtful cases and if antifungal treatment fails to produce a favorable response.
- A biopsy is especially warranted if premalignant or malignant lesions, such as erythroplasia of Queyrat or Bowen disease, are suspected and need to be excluded.

Histologic Findings

The histologic findings are nonspecific and eczematous in nature. Dermis contains lymphoplasmacytic infiltrates. Special stains for fungi, such as the periodic acid-Schiff (PAS) stain, may exhibit fungal elements characteristic of candidal organisms.

Medical Care

- Topical antibiotics (metronidazole cream) and antifungals (clotrimazole cream) or low-potency steroid creams for contact dermatitides often lead to clearing of the lesion. [26,27]
- Proper hygiene with frequent washing and drying of the prepuce is an essential preventive measure.

Surgical Care

Circumcision may be advocated in recurrent and recalcitrant cases.

Medication

Topical medications are the treatment of choice in this condition. The primary goal is elimination of various pathogenic organisms and control of inflammation.

Antifungals

The mechanism of action usually involves inhibiting pathways (enzymes, substrates, transport) necessary for sterol/cell membrane synthesis or altering the permeability of the cell membrane (polyenes) of the fungal cell.

Clotrimazole (Lotrimin, Mycelex, Femizole-7, Gyne-Lotrimin)

Imidazoles have broad-spectrum antifungal action and are used to treat dermal infections caused by various species of pathogenic dermatophytes, yeasts, and *Malassezia furfur*. Inhibits yeast growth by altering cell membrane permeability, causing death of fungal cells. Reevaluate diagnosis if no clinical improvement after 4 wk. Use 1% cream.

- Dosing

- Interactions
- Contraindications
- Precautions

Adult

After washing, gently massage into affected area and surrounding skin areas bid

Pediatric

Children: Not established
Adolescents: Apply as in adults

- Dosing
- Interactions
- Contraindications
- Precautions

None reported

- Dosing
- Interactions
- Contraindications
- Precautions

Documented hypersensitivity

- Dosing
- Interactions
- Contraindications
- Precautions

Pregnancy

B - Fetal risk not confirmed in studies in humans but has been shown in some studies in animals

Precautions

Not for treatment of systemic fungal infections; avoid contact with the eyes; if irritation or sensitivity develops, discontinue use and institute appropriate therapy

Antimicrobials

These agents tend to destroy microbes, to prevent their multiplication or growth, or to prevent their pathogenic action.

Metronidazole (1% Noritate cream, 0.75% MetroGel cream or lotion)

Imidazole with the ability to inhibit fungi, protozoa, and anaerobic bacteria. Anti-inflammatory effects include modulation of leukocyte activity.

- Dosing
- Interactions
- Contraindications
- Precautions

Adult

After washing, apply and rub a thin film on entire affected area qd/bid

Pediatric

Not established

Deterrence/Prevention

- Prevention has centered on improved hygiene of the prepuce.
- Although circumcision has been advocated for refractory or recurrent cases, this is now primarily used if improved drying and hygiene are not effective.

Prognosis

- The outcome is often favorable, with treatment failures often leading to further clinical examination and tailoring of the treatment to the particular offending agent.
- Failure of response in the setting of appropriate treatment should raise the suspicion of malignancy. This necessitates a biopsy to rule out both primary malignancies and secondary malignancies involving the penis. The most common malignancy that mimics balanoposthitis is erythroplasia of Queyrat, although Bowen disease may have some clinical overlap. A single case report has described the presentation of acute promyelocytic leukemia as an ulcerating balanoposthitis. [28]
- In a patient who is immunocompromised, the presence of a systemic fungal infection can lead to involvement of the penis and often arises as a more deeply involved ulcerating lesion. Treatment of this disease, which can be caused by any number of fungal agents, involves clearing the systemic infection and immunodepression.

Patient Education

- For excellent patient education resources, visit eMedicine's Men's Health Center. Also, see eMedicine's patient education articles Foreskin Problems and Circumcision.