

Chinese expert consensus on the diagnosis and treatment of balanoposthitis

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Balanoposthitis (BP), a common male genitalia inflammation, is managed by clinicians from different specialties, including urology, pediatrics, dermatology, and venereology. Due to this diverse array of clinicians involved, there exists a lack of consistent, evidence-based recommendations for BP. The development of the consensus engaged 19 representative hospitals and it adhered to rigorous protocols, encompassing international registration (IPGRP-2021CN003) and the application of evidence grading criteria and recommendation standards [Appendix S1, Supplementary File, <http://links.lww.com/CM9/C42>]. Over the period from December 2020 to October 2022,

consensus on 12 clinical issues was reached through comprehensive evidence searches and two iterations of Delphi surveys [Supplementary File, <http://links.lww.com/CM9/C42>].

Disease Concept

European guidelines define BP as inflammation from infection (e.g., *Candida*), dermatoses (e.g., Lichen sclerosus), or premalignancy (e.g., Bowen's disease).^[1] Glans and foreskin regions are commonly affected; hence, the term "balanoposthitis" is recommended,^[2] with BP symptoms varying depending on the underlying causes.

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Recommendations: BP encompasses inflammatory disorders affecting the glans and foreskin, presenting with erythema, edema, erosion, ulceration, and smegma secretion. Symptoms include discomfort, itching, and odor (D, 5).

Classification

Previously, BP was categorized into infectious balanitis, balanitis xerotica obliterans, zoon's plasma cell balanitis, non-specific balanitis, and balanitis circinata.^[3] While infection is a common cause of balanitis, a significant number of BP cases also involve non-infectious inflammatory diseases, emphasizing the importance of considering non-infectious causes.

Recommendations: Experts categorize BP into infectious and non-infectious, excluding specific skin conditions. Infectious BP occurs due to pathogens such as fungi and bacteria and non-infectious BP occurs due to unknown causes and in the absence of obvious infections (C, 4).

Correlation With Microbial Colonization

In a cohort study of 478 men with BP and asymptomatic individuals, *Candida* colonization prevalence was 26.2%, and candidal balanitis prevalence was 18%.^[4] *Malassezia*, *Staphylococcus (S.) aureus*, *Candida albicans*, and group B *Streptococcus* were also reported in BP patients. High rates of gram-positive cocci, fungi, and mycoplasma have also been observed in BP cases. *Mycoplasma genitalium* was present in 37% of the BP patients, while *Chlamydia trachomatis* and *Ureaplasma urealyticum* showed no association.^[5]

Recommendations: Microbial infections, including gram-positive cocci (*S. aureus*, Group B *Streptococcus*, *S. angina*, and *S. warneri*) and fungi (*Candida albicans* and *Malassezia* spp.), are common in BP (B, 3b). *Mycoplasma genitalium* and anaerobic bacteria are occasionally involved (B, 2b).

Correlation With Sexual Activity

Pathogenic bacteria, including *Candida*, were detected in balanitis patients and their spouses, indicating a risk factor.

Recommendations: BP is not considered as a sexually transmitted disease (STD), but can also be transmitted through sexual contact, with *Candida* infection being the main cause. Fungal testing is recommended for patients and their partners, and sexual activity should be avoided during antifungal therapy (B, 2c).

Inducing and Aggravating Conditions

A greater BP risk is present in diabetics, particularly in untreated individuals, with a link to hemoglobin A1c levels and diabetes management. Circumcision offers protection against penile dermatoses.^[6] Antibiotic overuse, immunosuppressants, and glucocorticoids increase the risk for opportunistic infections and BP.

Recommendations: BP risk factors include diabetes (A, 1b), uncircumcision (A, 1b), and immune deficiency. Candidal infection is common (B, 2b). Poor hygiene, excessive cleaning, and use of irritants may contribute to BP (C, 4).

Diagnostic Criteria

Male genital inflammation with unknown triggers is suggested to be non-specific BP. UK guidelines recommend penile biopsy for persistent or uncertain balanitis. Biopsy is also critical to exclude precancerous lesions. Increased microbial presence in BP patients underscores the need for swabs and cultures to identify infectious causes.

Recommendations: BP diagnosis relies on clinical manifestations and excludes specific skin disorders, with swabs and cultures used to identify infectious causes (B, 2b). With the absence of infections or non-specific histological abnormalities, the diagnosis is non-specific (non-infectious) BP (D, 5).

Identifying Other Conditions

Dermoscopy serves to distinguish BP from psoriasis, erythroplasia, and zoon's plasma cell balanitis, while reflectance confocal microscopy distinguishes BP from psoriasis, lichen sclerosis, and other common inflammatory balanitis. Histopathological examination is strongly recommended for indistinct clinical features, treatment failure, or suspicion of neoplasms. Swabs and cultures are effective for identifying specific penile infections, including STDs [Supplementary Table 1, <http://links.lww.com/CM9/C42>].

Recommendations: Differentiating BP from other skin disorders is aided by dermoscopy, reflectance confocal microscopy, and pathological examination. Swabs and cultures aid in ruling out infections. Testing for herpes simplex virus, syphilis, and gonorrhea is considered in the presence of genital ulcers (C, 4).

Disease Severity Evaluation

Aside from Li *et al.*,^[7] no approved measures of BP severity exist. While this tool lacks rigorous validation and will require further studies, experts agree that it provides a representative evaluation of the disease's extent.

Recommendations: The 4-point scale of Li *et al.*^[7] is recommended. This scale has eight items with scores ranging from 0 to 24 and higher values indicating greater severity (D, 5).

Therapeutic Principle

Previous guidelines stress avoiding excessive washing, over-the-counter medications, poor hygiene, and non-retraction of the foreskin.

Recommendations include good hygiene practices, gentle washing (A, 1c); circumcision for congenital phimosis or recurrent BP (A, 1b); antimicrobial medications for infectious BP along with partner treatment (A, 1c); and skin barrier restoration, glucocorticoids, or calcineurin inhibitors for non-infectious BP (D, 5).

Antifungal Therapy (Systemic and Topical)

Recommended topical antifungal agents include 2% ketoconazole, 1% butenafine hydrochloride, 1% clotrimazole, clioquinol (twice daily for 1–2 weeks), 1% bifonazole, 1% luliconazole (once daily for 1–2 weeks) (A, 1b), and pevisone (twice daily for 14 days) (B, 2c). Oral antifungal drugs, fluconazole (150 mg single dose) (A, 1b), itraconazole (200 mg once daily for 5 days), and terbinafine (250 mg once daily for 1–2 weeks) (B, 2a) are recommended for ineffective/severe cases.

Antibacterial Therapy (Systemic and Topical)

Recommended topical antibiotics include erythromycin, mupirocin (twice daily) (A, 1b), and 2% fusidic acid (thrice daily) (D, 5) for 7–14 days. Severe/refractory cases may require oral antibiotics such as fosfomycin tromethamine (3 g once daily for 3 days) (A, 1b) or erythromycin (500 mg once daily for 1 week) (C, 4). Topical 0.75% metronidazole can be used for mild anaerobic bacterial infections and oral metronidazole 400–500 mg (twice daily for 1 week) (D, 5) for severe cases.

Antibacterial and Antifungal Combination Therapy (Topical)

Combined antibacterial and antifungal topical therapy for refractory BP is recommended in individuals with underlying conditions like diabetes (B, 2c).

In conclusion, this is an evidence-based consensus on BP and serves as a significant step toward advancing the evaluation and management of BP in China. These findings will contribute to a global standardization and future consensus in this field.

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Conflicts of interest

None.

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