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Balanoposthitis

CLINICAL REVIEW

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Balanoposthitis is an inflammation of the glans penis and/or prepuce. It is a common condition with diverse aetiology. A targeted medical history and clinical examination are needed for correct diagnosis and treatment. This clinical review is a summary of the diagnostic process and treatment of balanoposthitis. The work is based on a selection of clinical guidelines and literature, as well as clinical experience from a dermatovenereology outpatient clinic.

Balanoposthitis is a descriptive term that encompasses various disparate conditions with inflammation of the glans penis and/or prepuce (1). The word originates from the Greek *balanos*, meaning acorn. Balanoposthitis has many aetiologies but is typically due to intertrigo (inflammation in skin or mucosal folds, often with bacterial or fungal overgrowth) (1). It is therefore rare in circumcised men (1, 2).

Anatomically, the penis can be divided into the penile root (radix penis), penile shaft (corpus penis), penile crown (glans corona), penile head (glans penis) and prepuce (preputium). The frenulum connects the prepuce to the penile head. The pocket beneath the prepuce is referred to as the sub-preputial space.

The sub-preputial environment is unique in terms of moisture, pH, cellular debris, irritants (such as urine and secretions) and microbiome. Within the prepuce are sebaceous glands that produce smegma, and within the urethra are Littré's glands, which produce mucus. Together these help to keep the penile head and the sub-preputial space moist (3). Common skin bacteria such as staphylococci and corynebacteria are found here, but the occlusive conditions also allow for the growth of other aerobic and anaerobic bacteria (4, 5). A prepuce that covers half or more of the penile head (redundant prepuce), as well as a tight prepuce that is difficult to retract behind the penile head, have been shown to increase the risk of balanoposthitis (4–6).

This clinical review discusses balanoposthitis among adult, uncircumcised patients (1, 2), and is aimed at primary and specialist health care, including general practitioners, dermatovenereologists and urologists. The content is based on clinical experience and the guidelines of the International Union Against Sexually Transmitted Infections (IUSTI) and the British Association for Sexual Health and HIV (BASHH) (1, 2, 7).

Aetiology

Eczema is the most common cause of balanoposthitis, and includes atopic, seborrheic, irritant and allergic contact dermatitis (4). Many of these constitute different forms of intertrigo. *Atopic balanoposthitis* often presents as erythematous, poorly demarcated and sometimes erosive mucosal changes (Figure 1). *Irritant contact dermatitis*, typically triggered by frequent use of soap, is particularly common and is often seen in atopic individuals. *Seborrheic dermatitis* is caused by hypersensitivity to the yeast *Malassezia furfur,* and its clinical presentation overlaps with other forms of eczema. The presence of flaky eczema in other seborrheic predilection areas (such as the scalp/face) increases the likelihood of seborrheic dermatitis. *Allergic contact dermatitis* differs from other forms of eczema and can lead to severe inflammation with erythematous and oedematous skin and/or mucous membranes. The medical history is directed towards potential allergens (latex, perfume and various preservatives). Allergies to cortisone preparations may also be found. In cases of repeated episodes of suspected (allergic) contact dermatitis, epicutaneous patch testing may be appropriate.

Figure 1 Eczema balanoposthitis. The image shows erythema with small erosions, and a large and tight retracted prepuce.

Psoriatic balanoposthitis can occur in isolation or simultaneously with other skin and nail changes. In circumcised patients, mucosal changes may have a classic psoriasis-like appearance, while erythematous and partly glazed mucosal changes may be observed in uncircumcised men. Maceration and secondary infection can also affect the clinical picture.

Candidal balanopostitis presents as somewhat non-specific, erythematous mucosal changes with soreness and itching. Erythematous papules, punctate erosions and/or whitish scaling increase the suspicion of fungal infection (Figure 2). Risk factors include diabetes mellitus, immunodeficiency, immunosuppressive treatment, antibiotic treatment, older age and excessive or poor hygiene (7). Candidal balanoposthitis is likely overdiagnosed, as less than 20 % of all balanoposthitis cases are due to candida infection (1).

Figure 2 Severe candidal balanoposthitis in a patient diagnosed with diabetes mellitus.

Bacterial balanoposthitis can be caused by both aerobic and anaerobic bacteria. *Aerobic balanoposthitis* is a common condition and is often caused by staphylococci and/or streptococci (8). Common findings include variable inflammatory changes, including erythema, mild oedema and occasional suppuration. In *anaerobic balanoposthitis*, severe inflammation can be found with mucosal oedema, foul-smelling, superficial and weeping erosions, and in some cases inguinal lymphadenopathy. Anaerobic balanoposthitis can be caused by spirochetes, fusiform bacteria and Gram-negative rods, including anaerobic bacteria associated with bacterial vaginosis (7, 9).

Balanoposthitis can be caused by sexually transmitted infections, but this is not common. *Mycoplasma genitalium*, *Trichomonas vaginalis*, herpes simplex virus (HSV) and human papillomavirus (HPV) have been reported as causes of balanoposthitis. Primary syphilis infection can, in rare cases, present as erosive balanoposthitis (syphilitic balanitis of Follmann).

Lichen sclerosus is an inflammatory skin disease that causes scarring to the penis. The aetiology is unknown, but chronic irritation triggered by urine may be one of the causes (1). Initial presentation can include erythema, fissures and haemorrhagic mucosal changes. Patients often report itching. Chronic inflammation can lead to sclerotic mucosal changes, adhesions, phimosis and meatal stenosis (Figure 3). It also increases the risk of malignant transformation to cancer by 0–12.5 % compared to healthy individuals (1, 10). Patients should therefore be referred to a dermatologist if lichen sclerosus is suspected.

Figure 3 Chronic lichen sclerosus (confirmed by biopsy). Constricted prepuce and whitish, sclerotic changes are seen distally on the prepuce.

Lichen planus is an inflammatory condition that affects the skin, nails, genital and oral mucous membranes (1, 7). Well-demarcated, erythematous plaques with saw-toothed, white striae can be seen on the penis, and erosions may develop. If the patient has typical changes elsewhere on the body, the diagnosis is easily established. Oral lichen planus is particularly recognisable by the whitish and reticular, sometimes erosive, changes in the buccal mucosa. Genital lichen planus can be asymptomatic, and treatment is not always indicated if symptoms are minor (7).

Plasma cell balanoposthitis (Zoon's balanoposthitis) is a benign, inflammatory condition often seen as well-demarcated, orange-red glazed mucosal changes (Figure 4). Red-brown punctuate lesions ('cayenne pepper spots') due to hemosiderin deposition are typically observed. The inflammation can lead to

adhesions between adjacent mucosal surfaces. The condition is primarily seen in older, uncircumcised men, likely due to chronic irritation triggered by urine and/or colonising microorganisms (1). Plasma cell balanoposthitis can be difficult to distinguish from (pre)malignant conditions. Diagnosis should be confirmed by biopsy, which shows a majority of plasma cells. Treatment combines hygienic, anti-inflammatory and antiseptic interventions. Circumcision is the most reliable curative treatment (2).

Figure 4 Plasma cell balanoposthitis (confirmed by biopsy) with involvement of the glans penis and prepuce.

Circinate balanoposthitis is a post-infective, reactive condition that can be triggered by bacterial urethritis or enteritis in patients with a genetic predisposition (HLA-B27), and can occur in isolation or as part of reactive arthritis (1). The most important aspect is to identify the underlying cause and, if necessary, treat it. *Chlamydia trachomatis* is a potential cause, and testing

for sexually transmitted infections is recommended. Circinate balanoposthitis often presents with a distinctive clinical picture characterised by greyish white, annular/geographic and coalescing mucosal changes. Patients often report mild itching and burning.

Non-specific balanoposthitis refers to cases with chronic or relapsing balanoposthitis symptoms where it is not possible to identify the cause(s) or achieve lasting remission (1). Topical corticosteroids have often been tried, typically combined with antifungal agents. Microbiological examination (including testing for sexually transmitted infections) is negative, and biopsy shows non-specific histopathological findings. In such cases, circumcision can be curative.

Diagnosis

The diagnostic process should start with a medical history that maps skin diseases, contact allergies and hygiene (frequency, use of water/soap/oil). Sexual history should be taken with a specific emphasis on risks and any regular sexual partner(s). Previous treatment and the duration of such treatment should be documented.

A sub-preputial swab is taken for bacterial and yeast culture to rule out infective cause as well as superinfection in another dermatosis if this is suspected. The growth of bacteria and/or fungi does not always indicate infection but typically represents normal skin flora and colonising microorganisms. Significant growth and/or pure culture increase the likelihood of clinical relevance and the efficacy of targeted treatment.

Epicutaneous patch testing is indicated where contact allergy is suspected. Blood and urine samples are taken when considering diabetes (in cases of candidal balanoposthitis). Biopsy is recommended in the absence of treatment response and on suspicion of (pre)malignancy (2). All ulcers that do not respond to treatment should be biopsied. The biopsy should be taken from the area than can provide the most representative sample with the lowest possible anatomical risk. Histopathological findings are not always conclusive.

Treatment

The patient should practise daily intimate hygiene. The prepuce should be properly retracted before washing. Only water should be used for intimate washing, or oil-based intimate wash products. Irritants (such as soap) are to be avoided in cases of inflammation. The prepuce should remain retracted until the penile head is dry.

For bacterial balanoposthitis, potassium permanganate can be used as an antiseptic. This can be obtained from a pharmacy without a prescription. The patient mixes 1.5–5 ml of potassium permanganate 3 % with 0.5 litres of lukewarm water in a bowl. The prepuce is retracted, and the penis is soaked in

this solution for approximately 5–10 minutes. Potassium permanganate can be used daily for 2–3 days in cases of bacterial balanoposthitis, and if signs of infection persist it can be repeated 2–3 times a week for 2–3 weeks.

Creams rather than ointments are recommended for use on mucous membranes and areas where skin meets skin. Topical treatment with corticosteroids should be gradually tapered off to avoid a rebound effect. Tapering should commence when symptoms have improved. Topical treatment with high-potency corticosteroids may increase the risk of recurrence of human papillomavirus and herpes simplex virus. Patients with a history of condylomas should, therefore, be informed of the risk of recurrence, and patients diagnosed with genital herpes should start antiviral treatment upon signs of a new outbreak. Patients using topical treatment should be warned about the risk of condom failure, as oil-based products and antifungal agents can weaken latex (11). Table 1 gives a summary of treatment recommendations for various forms of balanoposthitis (see the table at tidsskriftet.no).

Table 1

Treatment recommendations for balanoposthitis based on European guidelines from 2022 (1) adapted to Norwegian practices.

	Form of treatment	Dosage	Comments
Atopic/irritant dermatitis	Cortisone cream (group 2)	Apply 2 times daily for 1–2 weeks, then tapering regime[1] from symptom improvement. Maintenance treatment 1–2 times weekly may be necessary.	
Allergic contact dermatitis	Cortisone cream (groups 2–3)	Apply 1–2 times daily for 5–7 days.	The trigger must be identified and eliminated.
Psoriasis	Cortisone cream (group 2)	Apply 2 times daily for 1–2 weeks, then tapering regime[1] from symptom improvement. Maintenance treatment 1–2 times weekly may be necessary.	To prevent steroid-induced skin/mucosal atrophy, the patient can alternate between cortisone cream and a vitamin D analogue.
	Vitamin D analogues	Apply 2 times daily until symptom-free.	

	Form of treatment	Dosage	Comments
Candida and seborrheic dermatitis	Cortisone cream (groups 1–2) with antifungal agents	Apply 2 times daily for 1–2 weeks, then tapering regime[1] from symptom improvement. In cases of recurrence, antifungal agents may be tried as monotherapy.	Candida: partner treatment is considered to reduce the reservoir. Seborrheic dermatitis: recurrence is common and treatment must be repeated if necessary. Candida and seborrheic dermatitis: systemic antifungal treatment may be appropriate in prolonged cases and/or immunosuppressed patients
Aerobic bacterial infection	Potassium permanganate NAF 3 % (PP bath)	PP bath 2–3 consecutive days.	Initiate PP baths and cortisone cream concurrently. Consider systemic antibiotic treatment for pronounced symptoms, e.g. penicillin or dicloxacillin. The course of treatment should extend over 10 days to cover group A streptococci.
	Cortisone cream (group 1) with antibacterial agents	Apply 2 times daily for 7–10 days.	
Anaerobic bacterial infection	PP bath	PP bath 2–3 consecutive days.	Antibiotic alternative (perorally): Amoxicillin/clavulanic acid and clindamycin.
	Antibiotics (perorally)	Metronidazole 400 mg 2 times daily for 7 days.	
Sexually transmitted infections			Treated depending on sexually transmitted infection diagnosis and current guidelines.
Lichen sclerosus	Cortisone cream (groups 3–4)	Apply once daily until symptoms improve (3–4 weeks), then every other day for 4 weeks, then 2 times weekly for 4 weeks. Maintenance treatment 1–2 times weekly is often necessary.	The patient group often receives annual check-ups due to the risk of malignant transformation. Consider circumcision.

	Form of treatment	Dosage	Comments
Lichen planus	Cortisone cream (group 2)	Apply 2 times daily until symptoms improve (2–3 weeks), then every evening for 2 weeks, every other evening for 2 weeks and 2 times weekly for 1–2 weeks. Maintenance treatment 1–2 times weekly may be necessary.	Systemic treatment under the care of a specialist may be appropriate in cases of pronounced/erosive disease. Consider circumcision.
Plasma cell balanoposthitis	PP bath combined with cortisone cream (group 2)	PP bath 2–3 consecutive days. Then apply cortisone cream 2 times daily until remission (2–3 weeks), then every evening for 2 weeks, every other evening for 2 weeks and 2 times weekly for 2 weeks. Maintenance treatment with cortisone cream 1–2 times weekly is often necessary.	Consider circumcision.
Circinate balanoposthitis	Treat the triggering cause, alternatively use cortisone cream (group 2)	The treatment plan depends on what the triggering cause is. Tapering regime may be necessary.	

[1]Tapering regime: when symptoms improve, the treatment is tapered down to every evening for 1 week, every other evening for 1 week, and 2 times weekly for 1–2 weeks (e.g. Monday and Thursday).

Conclusion

Balanoposthitis is a common cause of genital conditions in uncircumcised men. Eczema conditions are most common and respond well to simple hygiene measures and topical corticosteroid treatment. The use of corticosteroids on genital mucous membranes, as outlined in Table 1 (see the table at tidsskriftet.no), is safe and can be initiated in primary health care. Treatment should be gradually reduced when symptoms improve. However, maintenance treatment is sometimes necessary for balanoposthitis. Patients with treatment-resistant balanoposthitis or suspected (pre)malignancy must be referred to the specialist health service.

The patients pictured have consented to publication of the article.

The article has been peer-reviewed.

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