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Handbook of Fungal Infections



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CHAPTER

4

Mucocutaneous Candidiasis

Nidhi Sharma, Ramanjit Singh

INTRODUCTION

Bacteria, archaea, viruses, and fungi live in the skin's dynamic and complex environment. Numerous genera, including *Malassezia*, *Rhodotorula*, *Debaryomyces*, *Cryptococcus*, and *Candida* in some locations, have been identified as frequent fungal skin commensals.

Particularly, the skin and mucosal surfaces of our bodies, such as the genitourinary system, mouth cavity, and gastrointestinal tract, are frequently colonized by *Candida* species. It causes a wide range of illnesses, from more superficial and minor clinical symptoms to illnesses that can be fatal in people who are immunocompromised. This microbe can become pathogenic and infect host tissues because of its capacity to develop in a variety of morphological forms (such as unicellular budding yeast, pseudohyphae, and genuine hyphae). Therefore, changes in the skin's environment, antibiotic use, underlying illnesses, and/or immune system changes can cause *Candida albicans* to transform from a commensal to a pathogen, leading to serious infections in vulnerable patients.

A fungal infection known as candidiasis is brought on by yeasts from the genus *Candida*. The most prevalent *Candida* yeast, *C. albicans*, is one of more than 20 kinds that can infect people. *Candida* yeasts can be found on mucous membranes and skin without infecting them; they often live in the intestinal tract.

Among cutaneous candidiasis, the infection usually affects genital organs causing vulvovaginal candidiasis (VVC) and balanitis.

VULVOVAGINAL CANDIDIASIS

The principal causative agents of VVC, a multifactorial infectious disease of the lower female reproductive system that causes pathologic inflammation, are *C. albicans* and other closely related *Candida* species. Unlike other types of candidiasis, VVC affects immunocompetent, otherwise healthy women, and is most common when they are pregnant.

A member of the normal human microbiota, *C. albicans*, commonly colonizes the vaginal lumen asymptomatically.

Exuberant mucosal inflammation that is predominantly brought on by fungal overgrowth in the vagina and followed by epithelial invasion and the synthesis of virulence effectors can result in symptomatic infection.

Clinical Traits

Itching, burning, soreness, and redness in the vaginal area, as well as a vaginal discharge that includes immune cells, yeast, and shed epithelium **(Fig. 1)**.

Risk Factors

- Utilization of antibiotics
- Engaging in sexual activity with an unclean partner



FIG. 1: Vulvovaginal candidiasis.

- Oral contraceptives high in estrogen
- Pregnancy
- Utilization of sodium-glucose cotransporter-2 (SGLT-2) inhibitors
- Unmanaged type 2 diabetes mellitus

The most common candidal infection in humans is VVC, which is thought to affect 75% of all women at some point in their lives. Furthermore, about 8% of women worldwide are affected by recurrent VVC (classified as more than three episodes per year). To prevent the recurrence of the condition, recurrent VVC frequently needs antifungal maintenance therapy with azole medications. The azoles' stagnant action and insufficient immune-mediated clearance are the main causes of illness recurrence.

Diagnosis

Mucocutaneous and cutaneous candidiasis:

- Obtain scrapings from the skin, oral, and vaginal mucosa or nails.
- The presence of hyphae/pseudohyphae or budding yeast cells on wet smear, as well as confirmation by culture, is the recommended procedure to diagnose cutaneous candidiasis.
- KOH smears are helpful.

Treatment of Vulvovaginal Candidiasis

Following are the treatment options for VVC:

- Fluconazole 150 mg oral single dose or (for severe disease or an immunosuppressed patient) three doses at 3-day intervals
- Butoconazole 2% vaginal cream, 5 g daily for 1–3 days
- *Clotrimazole*:
  - 1% vaginal cream (or other topical formulation), 5 g daily for 7–14 days
  - *Vaginal suppositories*: 100 mg daily for 7 days or 200 mg daily for 3 days
- *Miconazole*:
  - 2% cream, 5 g daily for 7 days
  - *Vaginal suppositories*: 100 mg daily for 7 days, 200 mg daily for 3 days, or 1,200 mg single dose
- Tioconazole 6.5% cream, 5 g single dose
- *Terconazole*:
  - 0.4% or 0.8% cream, 5 g daily for 7 or 3 days, respectively
  - 80 mg vaginal suppository daily for 3 days
- Nystatin 100,000 units vaginal suppository daily for 14 days

For suppression in patients with recurrent infections:

- Fluconazole 150 mg weekly for 6 months
- Clotrimazole vaginal suppository, 200 mg twice weekly or 500 mg weekly for 6 months

BALANITIS

Balanitis **(Fig. 2)** is inflammation of the glans penis, while inflammation of the prepuce is referred to as posthitis. Balanoposthitis is the word used when both areas are affected simultaneously in practice.

It is a group of dissimilar disorders that all affect the same anatomical region but present differently clinically and have different etiologies. Balanitis is frequent in uncircumcised men due to inferior cleanliness, aeration, or irritation from smegma, and preputial dysfunction is frequently a contributing or causative factor. When some underlying medical issues are present, balanitis may become more severe. In neutropenic men, it has been documented as a source of fever and bacteremia,



FIG. 2: Balanitis.

and candidal balanitis may be particularly severe in people with diabetes mellitus.

Types of Balanitis

Balanitis comes in three different forms:

1. *Balanitis in zoons*: The foreskin and penis head are also affected by this sort of inflammation. Middle-aged and older males with uncircumcised penises are typically affected by this type.
2. *Circinate balanitis*: Reactive arthritis is frequently linked to this kind of balanitis. On the penis head, they develop into little, painless lesions.
3. *Pseudoepitheliomatous keratotic and micaceous balanitis*: In this condition, the penis head develops scaly, wart-like lesions.

Symptoms and signs vary according to etiology.

Risk Factors

Poor Hygiene

Balanitis is a condition that can be brought on by poor hygiene associated with an uncircumcised penis. Daily cleaning and thorough drying of the penis to remove any moisture under the foreskin will help lower the risk, while excessive genital soap-washing might make the problem worse.

Additional risk elements include the following:

- *Diabetes mellitus*: An increase in the risk of infections is linked to uncontrolled diabetes mellitus. Some glucose may linger on the foreskin if it is present in the urine. Bacteria may grow more swiftly with the aid of glucose.
- *Phimosis*: This condition develops when the foreskin is excessively tight, making it difficult or impossible to retract or fully draw it back over the glans. Under the foreskin, sweat,

urine, and other fluids can collect, irritating the skin and fostering the growth of germs.
- *Unprotected sex*: Balanitis risk is increased by unprotected vaginal sex with a partner who has a yeast infection.
- Urinary catheterization, obesity, residing in a nursing home, and irritation exposure are other potential risk factors for balanitis.

Additionally, there could be a connection between penile cancer and balanitis. Patients with penile cancer are more likely than those without to get balanitis and posthitis, an inflammation of the foreskin. Penile cancer risk is increased in chronic balanitis.

Early circumcision, though, seems to lower the risk of penile cancer. Those who have had circumcisions experience less balanitis than males who have not.

Diagnosis

Balanitis is diagnosed by clinical examination, i.e., redness and inflammation of the glans. During an examination, sexually transmitted disease should be ruled out and the underlying cause should be looked for:
- Infection can be diagnosed by microbiological examination of a swab taken from the glans.
- Urine test for blood glucose may be done, if diabetes is suspected.
- Blood test can be done to determine glucose level.
- Rarely, biopsy is needed to exclude premalignant disease.

Management

The objectives of management are:
- To minimize sexual dysfunction
- To minimize urinary dysfunction
- To exclude penile cancer

- To treat premalignant disease
- To diagnose and treat sexually transmitted disease

All persistent/undiagnosed genital lesions regardless of appearance must be evaluated for herpes infection.

Treatment

Topical imidazole or ciclopirox cream or lotion twice daily for 1–2 weeks or until resolved.

Systemic agents for recalcitrant or severe cases:

- *Fluconazole*:
  - 50–100 mg po daily for 14 days
  - 150 mg po weekly for 2–4 weeks
- Itraconazole 100 mg po twice daily for 14 days

Referral

Patients may need to be referred for:

- Surgical evaluation for circumcision if symptoms are recurrent, especially if phimosis or meatitis occurs (note: Severe phimosis with an inability to void may require prompt slit drainage).
- Biopsy to rule out other diagnoses such as premalignant or malignant lesions if lesions are not healing.

SUGGESTED READINGS

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Handbook of Fungal Infections

Salient Features

- The *Handbook of Fungal Infections* is easy-to-read reference book for family physicians
- The handbook covers chapters on current epidemiology of dermatophytosis in India along with clinical presentations, misuse of topical corticosteroids in tinea infections, pharmacology of antifungal drugs, and guideline for treatment of fungal infections commonly encountered by family physicians in their clinical practice
- The chapters included in the book are written by experts from different parts of the country
- The book contains several images of different tinea infections seen in patients
- Simple language, tables, and flowcharts are included to make the handbook reader friendly.



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