

GENITAL DERMATOLOGY

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INTRODUCTION

Genital dermatology encompasses a wide variety of lesions and skin rashes that affect the genital area. Some are found only on the genitals while other usually occur elsewhere and may take on an atypical appearance on the genitals. The genitals are covered by thin skin that is usually moist, hence the dry scaliness associated with skin rashes on other parts of the body may not be present. In addition, genital skin may be more sensitive to cleansers and medications than elsewhere, emphasizing the necessity of taking a good history. The physical examination often requires a thorough skin evaluation to determine the presence or lack of similar lesions on the body which may aid diagnosis. Discussion of genital dermatology can be divided according to morphology or location. This article divides disease entities according to etiology. The clinician must determine whether a genital eruption is related to a sexually transmitted disease, a dermatoses limited to the genitals, or part of a widespread eruption.

SEXUALLY TRANSMITTED INFECTIONS AFFECTING THE GENITAL SKIN

Genital warts (condyloma) have become widespread. The human papillomavirus (HPV) which causes genital warts can be found on the genitals in at least 10-15% of the population. One study of college students found a prevalence of 44% using polymerase chain reactions on cervical lavages at some point during their enrollment. Most of these infection spontaneously resolved. Only a minority of patients with HPV develop genital warts. Most genital warts are associated with low risk HPV types 6 and 11 which rarely cause cervical cancer. However, high risk HPV types like 16 and 18 can be found in genital warts and infection with multiple subtypes is common.

Most genital warts are asymptomatic. Females may notice bumps which sometimes feels like a grain of sand on their vulva. Lesion may appear singly or as multiple bumps. In men, they are more easily noted raised above the skin. If they become large, they may cause itching, burning, or develop a discharge. In men most lesion occur on the penile shaft and perianal area. Scrotal lesions are distinctly uncommon. In women, the majority occur on the vulva, perineum, and perianal area. Lesions may be pink, tan, hyperpigmented or flesh colored. The surface of the lesion may behave a cauliflower-like, smooth, keratotic (or warty) or may be flat. Magnification may be helpful. The Centers for Disease Control (CDC) no longer recommends acetic acid soaks to improve diagnosis. The soaks are associated with many false positives. The differential diagnosis of genital warts included benign nevi, seborrheic keratoses, pearly penile papules, sebaceous glands, lichen planus, condyloma lata and molluscum. While a biopsy is not usually needed for diagnosis, it can be suggested for lesions greater than 1 cm, hyperpigmented, or resistant to treatment.

Treatment has been divided into broad groups of patient applied therapy and provider applied therapy. Patient applied therapies include podophyllotoxin and imiquimod while some common provider applied therapies include podophyllin, liquid nitrogen, trichloroacetic acid, and

surgery. The considerations of the patient are important as no therapy has been shown to alter the natural history of disease and recurrences even 1 to 2 years later are not uncommon.

Bowenoid papulosis is an HPV induced growth associated with high risk types 16 and 18. They are often larger and darkly pigmented in comparison to condyloma. Histology will show intra-epidermal atypical cells and some mitotic figures. Malignant degeneration has been reported, particularly in patients over 40. Treatment can be performed with liquid nitrogen, trichloroacetic acid, or excision in suspicious cases.

Molluscum contagiosum caused by the pox virus are usually small 1-3 mm pink to flesh colored papules that are known for their central dell or umbilication. They commonly appear on the suprapubic area when sexually transmitted although they may affect the penis and inguinal folds. While most lesions are asymptomatic, they can become painful if irritated and can appear very erythematous. Small lesions are easily missed with a quick exam. Differential diagnosis includes genital warts and folliculitis. Molluscum respond well the multiple treatments including curettage and liquid nitrogen. After a period of 6 months, recurrence is less likely.

Syphilis, caused by the spirochete *Treponema pallidum*, usually presents with a solitary painless non-crusted ulceration on the genitals. Painless unilateral adenopathy is also present. The lesion appears 9 to 90 days after sexual contact. Diagnosis is made by a wet mount using a dark field examination. Serology (RPR) may be negative in the very early part of an infection. The ulcer will heal without treatment over several weeks. Secondary syphilis appears 3 to 12 weeks after the onset of the chancre and lasts about 3 to 10 weeks. Skin manifestations are the most common form of secondary syphilis and are characterized by widespread erythematous to copper colored thin scaly plaques frequently involving the palms and soles. Condyloma lata is form of secondary syphilis presenting with 1-2 cm moist flat verrucous nodules. They are often adjacent or “kissing” lesions. Lymphadenopathy is common and patients appear somewhat ill. Secondary syphilis is also associated with mucous membrane involvement and a widespread papulosquamous rash extending to the palms and soles. Syphilis remains sensitive to penicillin.

Chancroid, caused by *Haemophilus ducreyi*, is characterized by single or several painful ulcerations on the genitals accompanied by painful adenopathy. Chancroid is often associated with prostitution. The incubation period is 5 to 20 days. The ulcer has a ragged undermined border. Lymphadenopathy may be fluctuant forming a bubo. The infection is difficult to culture with present methods and patient should be treated if empirically is suspected. While chancroid is uncommon in the U.S., it is the leading cause of genital ulcer disease in Africa and may facilitate HIV transmission. Treatment can be accomplished with azithromycin, erythromycin or ceftriaxone.

Granuloma inguinale (donovanosis) is a very rare cause of genital disease in the U.S caused by *Calymatobacterium granulomatis*. It presents with single ulcer. The ulcer is painless and appears large and friable with granulation tissue at the base. Diagnosis can be established by tissue smears or biopsy demonstrating the presence of Donovan bodies (cytoplasmic coccobacilli). If untreated, the ulcers can persist leading to scarring and lymphedema. Treatment with tetracycline or sulfa-trimethoprim is effective.

Lymphogranuloma venererum (LGV) caused by chlamydia trachomatis is also a rare cause of genital ulcers in the U.S. It occurs commonly in tropical areas such as India, East Africa and South American. LGV begins with a small painless papule that ulcerates and rapidly heals, often unnoticed by the patient. Patient usually present without ulcer but with massive inguinal adenopathy. Involvement of the inguinal and femoral nodes causes the so-called groove sign. Diagnosis can be made from culture from node aspiration. The preferred treatment is doxycycline.

Pediculosis pubis or crabs is caused by an infestation with a louse (phthirus pubis). They are spread from person to person usually through sexual contact. They appear as 1-2 mm tan-brown attachments to the hair shaft. Observing movement under magnification can confirm the diagnosis. A central dark area in the louse is noted after feeding. They attach with claws to pubic areas and periodically feed. Several weeks after infestations, patients develop itching. Lice can survive off the human body for up to 24 hours. Nits or eggs may be attached to the hair, typically as 1 mm solid concretions barely visible to the naked eye. They are more easily seen with magnification. Blue spots or macula cerulae may appear on the groin which represent bites. Typically, patients present with complaints of genital itching in the absence of visible lesions. The infestations readily responds to permethrin or lindane application for 10 minutes. If untreated, the infestation may spread to the axillary hairs and even the eyelids. The nits can be removed with a fine toothed comb.

Scabies is a common disorder characterized by intensely itchy lesions on the fingerwebs, abdomen, and genitals. 1-2 mm flesh colored burrows may be seen which contain the live mite. Itching usually occurs in 4 to 6 weeks in a patient without previous exposure. Typically, a patient will present with generalized itching focused on the dorsal hands and feet, waistline, umbilicus, and penis. The key to the diagnosis is the limited location of the eruption and a disproportionate degree of pruritus. Immunosuppressed patients such as those with advanced HIV infection may develop what is known as Norwegian scabies characterized by limited or diffuse hyperkeratotic somewhat yellow plaques which are literally teeming with million of mites. The degree of immunosuppression accounts for the mite proliferation and absence of itching. Treatment is accomplished with permethrin 5% cream applied overnight. Lindane lotion is still effective in most cases. Neurotoxicity limits its use in children and pregnant women. A new treatment is ivermectin 12 micrograms per kilogram. It is made in 6 mg tablets. 2 would be appropriate for an adult male.

Patients with scabies may develop indurated nodules on the scrotum. Biopsy will show hypersensitivity reaction presumably to remnants of the scabies mite. The lesion are not infectious. They will resolve over several months or can be treated with intralesional steroids.

GENITAL INFECTIONS OTHER THAN SEXUALLY TRANSMITTED DISEASES

Tinea cruris or jock itch is a relatively common problem. Typically, a male will present complaining of a rash that is somewhat for several weeks or months in the groin. Most patient have typically tried several over the counter creams, powder, or sprays, so a good history is important. Inciting factors include obesity and excessive heat and humidity. Men are affected more than women. Patients present with diffuse bilateral erythema and scaling along the inguinal folds. A raised border typical of tinea infection is usually present. The eruption may extend along the perineum up the gluteal cleft. Involvement of the scrotum is distinctly uncommon and another diagnosis should be considered with extensive scrotal involvement. Most tinea cruris are caused by fungi like Trichophyton rubrum.

Candidiasis also occurs in the inguinal folds. The eruption is erythematous and scaly but usually without a raised border. So-called satellite lesions consisting of small patches are present near the inguinal folds. In women, the inframammary fold should be examined. Incontinence and heat are inciting factors. Both tinea cruris and candidiasis readily respond to topical antifungal treatment such as econazole, ketoconazole, cicloprox, or terfenidine. Nystatin will not effectively treat tinea. The use of mixture containing lotrimin and topical steroids is strictly discouraged due to lack of efficacy in eradicating infection as well as steroid atrophy in the thin genital skin characterized by a waxy appearance, softness, and telangiectasia. Removing environmental factors such as heat, sweat, and obesity are important to prevent re-infection. Men may be encouraged to wear boxers. Patients should also consider an antifungal powder.

Candidal balanitis occurs in uncircumcised men, particularly associated with excessive heat and humidity. Diabetes as an underlying cause should also be considered in those with recurrent infection. The infection often follows intercourse with an infected partner. Patients present with mild glazed erythema on the glans penis accompanied by satellite eroded pustules and curdlike accumulations. Topical antifungal treatment is usually effective. Excessive washing should be discouraged.

Tinea versicolor caused by *Pityrosporum ovale* may present with tan patches in the pubic area alone or in association with similar lesions on the chest and back. The eruption is usually asymptomatic. Diagnosis can be confirmed clinically with a KOH prep which will show the typical "spaghetti and meatballs" appearance. The eruption will respond to selenium sulfide lotion or any of the axole creams. Oral azole may be considered if the eruption is extensive.

Erythrasma is an uncommon bacterial infection caused by *Corynebacterium minutum* that presents with diffuse thin red patches along the inguinal folds. Unlike tinea cruris, no raised border or central clearing is noted. Patients are typically indigent or have infrequent washing. Diagnosis can be aided by a Wood's light in which the infection shines a coral red fluorescent color. Treatment is easily accomplished with topical or oral antibiotics such as erythromycin or clindamycin.

Trichomycosis is a bacterial infection associated with *Corynebacterium tenuis* that present with yellow to white concretions on the pubic or axillary hair. Heat and dampness precipitate the infection. Treatment is with topical or oral erythromycin. The eruption is associated with warm humid climates and excessive clothing.

Folliculitis usually caused by *Staphylococcus aureus* (S.aureus) is common in the follicle rich genital region. Typically, patients have several 1-2 mm pustules, each centered around a hair follicle. Careful exam may show a hair follicle extending out of the pustule. Note, the lesions are not grouped nor are they usually unilateral like genital herpes. Folliculitis can occur anywhere on the genitals though less common on the distal penis due to absence of follicles. Heat and sweat are aggravating factors. Patients may give a history of a new exercise routine or wearing synthetic jogging pants that retain perspiration. Patients will respond to topical or oral antibiotics directed toward S.aureus. A mainstay of treatment is antibacterial soaps.

Lyme disease commonly presents in the genital area as ticks may lodge along the waistline and not be noticed for extended periods of time. Patients present with a large expanding pink to erythematous plaque, often 10 to 10 cm in size. A tick bit may or may not be visible.

INFLAMMATORY DERMATOSES OF THE GENITALS

Psoriasis is the most common inflammatory reaction affecting the genitalia. It may appear in 2 forms. Patients may develop bright red well-defined inguinal plaques known as inverse psoriasis. The scale so apparent in other parts of the body is not seen. No central clearing often seen in tinea is present. The plaque appears homogeneously erythematous. Similar lesions may be affect the axilla or the popliteal fossa. Unlike psoriasis elsewhere, inverse psoriasis may be itchy. Often, no past history of psoriasis is present.

Psoriasis may affect the penis, particularly the glans penis. Thin pale erythematous plaques with slight scale are seen in discreet or continuous forms. No itching or burning is present. It may be aggravated by trauma. Often, no psoriasis is seen on the rest of the body. Like inverse psoriasis, psoriasis on the penis tends to be well defined. No vesicles or erosions are seen.

Both types of psoriasis respond well to low-potency cortisone creams. Mid and high potency steroids must not be used to avoid atrophy. It can be helpful to compound hydrocortisone 2.5% cream and ketoconazole cream. Many clinicians feel that candida helps precipitate psoriasis in susceptible individuals. Calcipotriol cream, a vitamin D derivative, used elsewhere for psoriasis can be a non-steroidal alternative for psoriasis on the glans penis.

Reiter's disease is associated with arthritis, urethritis, and conjunctivitis. Patients may also develop a balanitis circinata consisting of moist serpiginous plaques with ragged white borders on the glans penis. Histologically, the eruption resembles psoriasis. Reiter's disease has been associated with intestinal infection or venereal diseases like chlamydia. The balanitis improves with topical steroids.

Eczema frequently affects the genital region, particularly the scrotum. Patients complain of intense itching often related to heat and sweat. Patients present with lichenified erythematous plaques on the lateral scrotum. Darker skinned patients often exhibit hyperpigmented rather than erythematous eruptions leading the clinician to underestimate the degree of inflammation. In acute cases, low potency topical steroids for a maximum of 2 weeks can be helpful. In chronic cases, most topical medications are soothing for only a few hours. Patients often wash the area vigorously with soap feeling that cleanliness will aid the problem. Getting them to stop excessive washing is very important to long term resolution. Zinc oxide paste is very soothing and helps absorb sweat. For particularly inflammatory eruptions, hydrocortisone 2.5% cream can be added to the zinc oxide. The eruption may develop into lichen simplex chronicus (LSC) characterized by extensive lichenification and hypertrophy of the affected skin. The lichenification results from prolonged scratching and rubbing. Breaking the itch-scratch-itch cycle is paramount. Antihistamines at night may temporarily provide relief. Vulvodynia defined by the complaint of burning in the vulva region is beyond the scope of this article.

Contact dermatitis can be divided in irritant and allergic forms. All patients are theoretically susceptible to irritant contact dermatitis. It may develop from chronic use of soaps, disinfectants or aseptic solutions. The latter are often used in hopes of preventing STD's. Irritants

can be transferred from the hands to the genitals such as 5-fluorouracil cream used for actinic keratoses on the face.

Allergic contact dermatitis is also common. The penis may develop immense swelling accompanied by erythema and scaling. The marked edema occurs because of the thin elastic skin on the genitalia. The list of offenders is numerous and includes many medications used elsewhere on the body that can be transferred to the genital area. Poison ivy or rhus dermatitis is commonly transferred by the hands to the genitals. Lesions on other locations are common. Benzocaine, triple antibiotic ointment, and topical benadryl are frequent offenders. Obtaining a history of topical products is very important as many products may be used in patients who are concerned about hygiene or STD's. Men with latex allergy can develop erythema and scale along the entire penis due to latex condoms. Treatment is mild topical steroids. Switching to a non-latex condom is another option..

Fixed drug eruptions can occur secondary to antibiotics from the tetracycline class or laxatives containing phenolphthalein. More than 500 medications have been implicated. The eruption presents acutely with single or multiple well defined circular plaques on the distal shaft and glans penis. The eruption may be bullous. The surface can appear necrotic. It has been compared to branding with a hot iron. Some patients have been falsely labeled with herpes simplex due to the intermittent nature of the eruption. Females do not seem to get genital fixed drug eruptions as commonly as men. Recurrent eruptions are associated with hyperpigmentation.

Lichen planus is an inflammatory disorder characterized by violaceous flat-topped papules that may appear on any part of the body. Typically, the glans penis is involved as part of a systemic process. Multiple small 2-5 mm flat topped papules are seen. No vesicles, erosions, or crust are seen. While the etiology is unknown, drugs and infection such as hepatitis C have been identified as precipitants. Men and women may present with an erosive lichen planus variant confined to the mucosal surfaces of the genitalia. Women may develop painful erosions along the introitus. No adenopathy is present. Biopsy to differentiate from lichen sclerosis is helpful. The diagnosis can be aided by demonstrating similar lesion in the oral mucosa, particularly the posterior buccal mucosa.

Lichen nitidus is a similar inflammatory disorder of unknown etiology. Patients may present with a monomorphic flesh colored 1-2 mm papules along the shaft of penis. Similar lesions may be present on the elbows, knees, and around the umbilicus. No grouping or umbilication is seen.. Both lichen planus and lichen nitidus respond well to low potency cortisone creams.

Lichen sclerosis is a progressive sclerosing dermatosis of unknown origin. Atrophic white plaques occur in men on the glans or prepuce. The eruption tends to fissure. Adhesion may develop. In females, extensive white atrophic plaques may cover most of the vulva and perianal area forming a "figure of 8" appearance. Adhesions may also develop obliterating the labia minora and sometimes narrowing the vaginal orifice. Skin biopsy is necessary to make the diagnosis. Lichen sclerosis of the glans penis (balanitis xerotica obliterans) may result in phimosis necessitating circumcision. In the past, treatment with testosterone cream were used. Clinically studies have not validated their use. Recently, the use of high potency topical steroids like clobetasol for short periods of times has resulted in complete remission. These patients need to be under the care of an expert in genital disease.

Vitiligo can appear similar to lichen sclerosis, also presenting with hypopigmented or depigmented areas on the genitals. Unlike lichen sclerosis, no atrophy is present. In men, the glans penis and shaft are commonly affected. There are no symptoms. Diagnosis can be aided by the presence of depigmented areas elsewhere on the body, especially on the face and dorsum of the hands. Treatment, if desired, with low potency steroids is helpful in some cases.

Acanthosis nigricans is a relatively common disorder characterized by thickened brown velvety plaques in the inguinal folds primarily in obese people. Similar asymptomatic lesions can be seen on the neck and axillary folds. Treatment, often unsatisfactory, can be attempted with tretinoin cream.

Hidradenitis suppurativa presents with inflammatory red somewhat fluctuant nodules along the inguinal folds and gluteal cleft. Lesions may be several centimeters in size. Pain is common. Most clinicians now believe feel this disorder represents an inflammatory form of acne inversa rather than an infectious process. Lesion should be sought in the axilla. Larger lesions may need incision and drainage. Bacterial culture usually reveals a mixed infection of multiple bacteria with varying degrees of resistance. Most patients have been treated with multiple courses of antibiotics. Smaller lesions will respond to antibiotics or steroid injection but relapse is common. Anecdotally, some patients may avoid all sexual contact thinking the eruption is an STD.

Behcet's syndrome is a rare cause of genital ulcers, primarily seen in patients of Turkish descent or in the Far East. The genital ulcers are associated with oral sores, erythema nodosum, uveitis, and lymphadenopathy. Local extension from Crohn's disease may also cause genital ulcerations.

Zoon's balanitis presents with a chronic erythematous lesion on the distal penis in uncircumcised men. The lesion is poorly defined and has a moist surface. The histology is quite distinctive demonstrating numerous plasma cells. Biopsy is required to rule out a malignant process.

Purple striae from steroid atrophy often occur in the inguinal folds and thighs after using high potency steroids for one month.

BENIGN LESIONS

Sebaceous hyperplasia is common on the genitals in men and women. Patients who perform self-examination may be shocked to learn there are dozens of suspicious lesions present along the vulva or along the proximal penile shaft. Lesions tend to be 1-2 mm yellow to flesh colored monomorphic papules sometimes containing individual hairs. Having pictures of normal human anatomy can be reassuring to patients as they are concerned about genital warts.

Vestibular papillae are also normal variants found in up to one-half of premenopausal women. These small monomorphic filiform tubular projections appear in the vestibule and may be confused with genital warts. Reassurance to the patient is all that is needed.

Pearly penile papule (PPP) present on the coronal sulcus of the glans penis with monomorphic 1-2 mm flesh colored smooth papules. They may present during late adolescent and

may be clinically confused with genital warts. The lesions are asymptomatic and reassurance is all that is needed.

Epidermal cysts are common in the follicle rich genital area. They consist of a dilated oil gland or hair shaft that may reach 1-2 cm in size. They are usually asymptomatic but patients are concerned over the appearance and may request removal. Lesions respond well to simple excision. Scrotal cysts commonly calcify forming rock-hard deposits. Multiple lesions are known as scrotal calcinosis. No treatment is needed but individual lesions may be excised. Median raphe cysts occur on the ventral midline of the penis and probably represent a fusion anomaly.

Angiokeratomas are common asymptomatic vascular lesions occurring on the scrotum. They may be identified incidentally on an exam. Lesions appear as red to black 1-4 mm nodules. Patients may present after an episode of bleeding after trauma. Histologically, dilated capillaries in the upper dermis are seen. Reassurance is all that is needed. Lesions that persist in bleeding may be cauterized or excised.

Hyperpigmented macules occurring on the genitals are called genital lentiginoses. Lesions may be darkly pigmented simulating melanoma. However, no induration or raised areas are seen. Biopsy will reveal melanocytic hyperplasia without atypia. No treatment is needed.

Skin tags or achrochordons are soft fleshy papules that occur in the inguinal folds along with neck and axilla. Confusion with genital warts is uncommon. Lesions that are irritated by clothing or bleed after trauma are easily removed by snipping with scissors.

MALIGNANT LESIONS OF THE GENITALS

Squamous cell carcinoma (SCC) is the most common genital skin cancer. Men present in their 50's and 60's with red irregular defined plaques typically along the coronal sulcus. They may give a history of the lesion being present for 1-2 years. A history describing partial clearing with topical creams is common as most patients have attempted some form of treatment. A key to the history is that the lesion never completely resolved. Some cases have been linked to HPV infection. In-situ lesions on the distal penis are also referred to as erythroplasia of Queyrat and are usually treated by excision with little morbidity. Invasive SCC of the penis occurs primarily in uncircumcised males. Women may develop vulvar SCC which presents with ill defined erythematous somewhat scaly plaque. Invasive SCC on the genitals in men and women tends to be aggressive and metastases are common.

Anal cancer has increased somewhat in the last 10 years, particularly in HIV positive gay men. It is still a rare disease. HPV has been found in most of the lesions. Patients present with erythematous broad based vegetating plaque that often has bled. Excision is the preferred form of treatment.

Malignant melanoma is uncommon. Vulvar melanoma presents with a growing black irregularly defined nodule. Patients often present after the lesion has grown so large as to have crusted. The prognosis is poor as the lesion has usually become invasive by the time the patient see a clinician.

Kaposi's sarcoma often involves the genitalia as part of a disseminated disease. It often responds to liquid nitrogen. Other cancers can appear on the genitals but do not seem to have any predilection for this area.

CONCLUSION:

Genital dermatology is a varied field characterized by a multiplicity of lesions and eruptions. Proper history taking is important as many eruptions may acquire an atypical appearance due to prior use of medication by the patient. Moistness, heat, and sweat combine to aggravate common dermatoses that involve the genital area. Cultures, KOH, and a magnifying glass are indispensable tools for the clinicians. When in doubt, consider a biopsy for a persistent eruption which can confirm or dispel a diagnosis. Patients often appreciate an astute clinician who can provide answers for this sensitive part of the body.

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