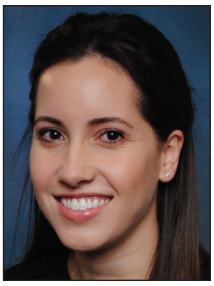
Infectious diseases of genitalia

by Christina Kraus, MD, Sama Kassira Carley, MD, and Lance Chapman, MD, MBA

INFECTIOUS GENITAL CONDITIONS	ORGANISM	CLINICAL	DIAGNOSIS	MANAGEMENT	COMMENTS
Bacteria					
Gonorrhea	*Neisseria gonorrhoeae*	Men: dysuria, purulent discharge; +/- testicular pain and swelling. Women: purulent discharge, dysuria; +/- edema, tenderness of Bartholin's glands; +/- abdominal pain, and fever (PID). Disseminated: acute asymmetric arthritis, fevers, hemorrhagic pustules in distal extremities.	Path: Epidermal necrosis sometimes with pustules, neutrophilic inflammatory reaction, extravasated RBCs. Micro: Gram negative diplococci on gram stain; culture (gold standard), molecular test (PCR).	Ceftriaxone 250mg single dose IM + azithromycin 1 gm PO x1.	10% of men and 50% of women infected with gonorrhea are asymptomatic. Commonly co-infected with chlamydia.
Syphilis/condyloma lata	*Treponema pallidium*	Primary stage: Weeks to months after infection. Non-tender ulceration (chancre) with LAD. Secondary stage: 6 months, malaise, fever, lymphadenopathy, and disseminated rash +/- palmoplantar. Tertiary stage: Months to years, spread to skin, bones, CNS, ocular, and CV system. Development of gummas (eroded plaques).	Path: Dense Th1 immune response with treponemes, +plasma cells. Secondary stage +/- granulomatous. Tuberculoid granulomas in tertiary. Non-treponemal tests: VDRL, RPR. Become negative with treatment. Treponemal tests: TTPA, FTA-ABS, FTA-ABS-19S-IgM (higher specificity), SPHA.	Primary: Benzathine penicillin 2.4 million units single dose; procaine penicillin 1.2 million units daily for 10 days. Alternatives: Doxycyline, tetracycline, ceftriaxone, azithromycin. Latent: Benzathine penicillin 2.4 million units weekly for 3 doses; procaine penicillin 1.2 million units daily for 20 days. Alternatives: Doxycycline, tetracycline. Neurosyphilis or ocular syphilis: Aqueous IV penicillin 3-4 million units q4h for 10-14 days. Alternatives: Ceftriaxone or desensitization.	FTA-ABS is the first test to become positive and stays positive for life.
Chancroid	*Haemophilus ducreyi*	Papule -> pustule -> tender genital ulcer with tender LAD. Multiple or giant variants. Men: shaft of penis or prepuce. Women: introital area.	Path: 1st zone: necrotic debris with neutrophils; 2nd zone: granulation tissue; 3rd zone: infiltrate of plasma cells and lymphocytes. Micro: Gram stain with "school of fish" or railroad track small gram-negative bacilli; culture.	Azithromycin 1 g single dose.	Chancroids are an important risk factor for acquiring HIV. Co-infection with syphilis or HSV is common.
Lymphogranuloma venereum	*Chlamydia trachomatis serovars L1-3*	Primary: Herpetiform lesion at exposure site which heals spontaneously on coronal sulcus in men and posterior vaginal wall in women. Mild dysuria or tenderness, +/- LAD. Secondary: Unilateral, red, tender LAD (bubo) with rupture with drainage. Late: ano-genito-rectal syndrome with anogenital fistulas and LAD.	Path: Ulceration with mixed infiltrate with multinucleated giant cells, +/- abscesses. Stellate abscessed in lymph nodes. Giemsta stain showing Gamma-Favre bodies. Micro: Chlamydia-specific PCR, more sensitive than culture.	Doxycycline 100mg BID or erythromycin 500mg QID for 3 weeks.	Exclude other causes of genital ulcers during workup.
Granuloma inguinale (donovanosis)	*Klebsiella granulomatis*	Small nodule that progresses to a large 'beefy' ulcer, tendency to bleed, malodorous. Most commonly on penis or vulva.	Path: Ulceration with granulation tissue, PEH at edges, neutrophilic abscesses. Giemsa, Wright, or leishman stain for Donovan bodies Micro: Smears from tissue showing Donovan bodies.	Azithromycin 1 g PO once weekly for at least 3 weeks or until all lesions heal.	Extra-genital lesions affecting skin, bones, abdominal cavity, and oral cavity have been reported.
Perianal streptococcal dermatitis	Group A beta-hemolytic *Streptococcus* (can also be caused by Group B strep and *staphylococcus aureus*)	Perianal bright red well-demarcated patches, associated with pruritus. +/- painful defecation, fissures, exudate, erosions.	Bacterial culture of skin to confirm microbe.	Oral penicillin (unless *S. aureus* is identified) or oral cefuroxime (+ test of cure) for 2-3 weeks. Can add topical mupirocin ointment.	Most often seen in pediatric patients.
Erythrasma	*Corynebacterium minutissimum*	Clinically, may mimic tinea cruris. Well-demarcated pink to brown plaques with fine scale in crural creases. Common in warm climates.	Path: Perivascular infiltrate of lymphocytes. Gram stain will reveal gram-positive rods in cornified layer. Wood's lamp: Fluoresces coral-red.	Erythromycin 500 mg BID for 7-14 days. Alternatives: topical erythromycin, topical clindamycin, topical fusidic acid.	Coral-red fluorescence under wood's lamp due to coproporphyrin III.
Bullous impetigo	*Staphylococcus aureus*	Flaccid blisters or pustules (sometimes only collarette noted) which can involve genital area and proximal thighs.	Bacterial culture of skin confirming *S. aureus*. Subcorneal split (desmoglein 1).	Limited disease - mupirocin cream or ointment. Otherwise antistaphylococcal antibiotic such as doxycycline or clindamycin.	*S. aureus* can be cultured at site of lesion (unlike in staphylococcal scalded skin syndrome). Usually caused by *S. aureus*, phage II, type 71.
Reactive arthritis (previously called Reiter syndrome)	Immune response often precipitated by one of the following infectious agents: *yersinia enterocoliticia, neisseria gonorrhoeae, chlamycia trachomatis, shigella flexneri, ureaplasma urealyticum, campylobacter fetus.*	Red plaques with pustules, scale, crusts on hands, feet, genitalia (keratoderma blenorrhagicum affects palms/soles). Small ulcers on shaft or glans penis. Associated with arthritis, conjunctivities, urethritis or cervicitis.	Should be tested for HIV and chlamydia and stool cultures performed if diarrhea.	If infection present, treatment should ensue. Mild disease - NSAIDs at anti-inflammatory doses or topical CS (circinate balanitis usually improves with low-potency topical CS). Moderate to severe disease - oral methotrexate or cyclosporine or biologics.	HLA-B27 positivity is common.



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INFECTIOUS GENITAL CONDITIONS	ORGANISM	CLINICAL	DIAGNOSIS	MANAGEMENT	COMMENTS
Viruses					
Genital herpes	Herpes simplex virus 2 > 1	Painful grouped vesicles on an erythematous base. May progress to ulceration with crusting. May lead to extra-genital lesions, urinary retention, aspetic meningitis.	Path: Enlarged gray keratinocytes that progress to multinucleated giant cells, ballooning degeneration, Cowdry A inclusions, dense mixed infiltrate, may have extensive epidermal necrosis. Micro: Viral culture, DFA, Tzanck smear.	Acyclovir 400mg TID 7-10 days; valacyclovir 500mg QD 3 days; famciclovir 1g x1. May be used in HIV+ patients as well. If 6 or more outbreaks per year or seronegative partner, chronic suppressive therapy. Acyclovir resistant: foscarnet, cidofovir.	Genital lesions are frequently asymptomatic.
Condyloma acuminatum	Human papillomavirus	Variety of clinical presentations. May be solitary or clustered, can be warty or flat or papular. May be white, pink, skin-colored, pigmented.	Acetic acid can be applied to whiten lesions. Path: epidermal acanthosis, koilocytes. PCR to identify type.	Cryotherapy, TCA, electrocautery, podophyllotoxin, imiquimod, surgical excision, laser surgery, sinecatechins.	High-risk genotypes: 16, 18, 31, 33, and 35. Low-risk: 6 and 11.
EBV or CMV-associated ulcers	Epstein-barr virus or Cytomegalovirus	Aphthous-appearing ulcers in immunocompetent patients. The ulcers are usually deeper, larger and more friable in immunocompromised patients.	Viral culture or PCR revealing virus or IgM antibodies, respectively.	EBV: Usually supportive. CMV: ganciclovir or valganciclovir. Foscarnet and cidofovir are second-line agents.	Both are types of human herpesviruses. EBV is HHV4. CMV is HHV5.
Molluscum contagiosum	Molluscum contagiosum virus (a DNA poxvirus)	White to skin-colored dome shaped papules and nodules, some with central dell.	Path: Henderson-Patterson inclusion bodies.	No treatment vs topical treatment. Curretage. Cryotherapy, cantharidin, imiquimod.	Immunocompromised patients are at increased risk of infection and when affected, have more diffuse involvement.
Kaposi sarcoma	Human herpesvirus type 8	Red, brown, or purple papules or patches or nodules.	Path: promontory sign, slit-like vascular spaces.	Topical retinoids, excision, cryotherapy (2 freeze cycles), radiation, intralesional vincristine or bleomycin, initation of ART if patient with AIDS.	Genital lesions occasionally occur and can involve penile shaft or suprapubic area. Few reports of involvement of female genitalia.
Fungi					
Cutaneous candidiasis	*Candida albicans*	Red plaques, often with satellite papules, pustules, collarettes. Involes crural creases, vulva, scrotum. Glans penis is frequently involved in uncircumsized men.	Microscopic exam demonstrating pseudohyphae or yeast is diagnostic. Path: hyphae and pseudohyphae in stratum corneum, neutrophilic inflammation and subcorneal pustules.	Topical azoles such as clotrimazole, miconazole, ketoconazole, econazole BID. If concern for vaginal yeast, treat with oral fluconazole 150 mg x1.	
Tinea cruris	Dermatophytes (most commonly *trichophyton rubrum)*	Erythematous annular plaques often with central clearing and raised scaly border.	KOH prep demonstrating hyphae. Path: parakeratosis, neutrophilic inflammation, hyphae in stratum corneum. PAS or GMS highlight hyphae.	Topical azoles such as clotrimazole, miconazole, ketoconazole, econazole BID. Can use topical terbinafine, ciclopirox. Oral therapy for majocchi granuloma or extensive disease includes terbinafine 250 mg QD, fluconazole 150-300 mg QD, itraconazole 200mg QD. Griseofulvin for severe cases. Oral treatment for many weeks (4-12).	Scrotum rarely involved.
White piedra	*Trichosporon* species, *Trichosporon inkin* is the most common organism affecting pubic hair.	White or brown concretions along hair shaft, may be tubular and easily separated from hair shaft. May cause hair breakage. Usually asymptomatic.	KOH prep: revealing hyphae, arthroconidia, blastoconidia. Culture: Creamy yellow-white colonies on Sabouraud's dextrose agar.	Shaving the hair is first-line but oral and topical antifungals can be used. Consider topical imidazoles, ketoconazole shampoo, or oral fluconazole.	
Ectoparasites					
Pediculosis pubis (pubic lice)	*Phthirus pubis*	Adult lice can be seen with the naked eye. Erythematous macules or papules at feeding sites. +/- Inguinal LAD. Maculae ceruleae (blue-gray macules) seen in chronic infestations. Significant pruritus.	Clinical, enhanced by dermoscopy.	Launder all clothes (at least 130 degrees F). Permethrin 1% cream is the safest and most effective. Topical lindane or oral ivermectin may be used as alternatives.	The crab louse resembles a miniature crab with wider, shorter bodies than head lice.
Scabies	*Sarcoptes scabiei var. hominis*	Small red papules, often with excoriations, commonly involves penis and scrotum or vulva. Intense pruritus, usually worse at night. May see burrows. Dermoscopy: delta wing sign. Crusted scabies presents with thick, crusted plaques.	Mineral oil scraping: identify mite or scybala. Path: mites, ova, scybala in stratum corneum. Inflammatory infiltrate of eosinophils and lymphocytes.	Permethrin cream 5% overnight and repeat in one week or ivermectin 200 ug/kg repeated in two weeks. Second line: lindane lotion or sulfur ointment. Do not use oral ivermectin in children <5 years of age due to CNS side effects.	Crusted scabies is seen in the immunocompromised.

Abbreviations:

PID - pelvic inflammatory disease. LAD - lymphadenopathy. CNS - central nervous system. VDRL - Venereal Disease research Labaratory Test. RPR - Rapid Plasma Reagin. TTPA - T.palladium particle agglutination test. FTA-ABS - Fluorescent treponemal antibody test. SPHA - solid phase hemabsorption test. PEH - pseudoepitheliomatous hyperplasia. DFA - direct fluorescent antibody assay. BID - twice a day. QD - once a day. KOH = Potassium hydroxide. PAS - Periodic acid–Schiff. GMS - Grocott-Gomori's methenamine silver stain. TCA - Trichloroacetic acid. ART - antiretroviral therapy. AIDS - acquired immunodeficiency syndrome. q4h - every four hours. CV - cardiovascular. CS - corticosteroids. NSAIDs - non-steroidal anti-inflammatory drugs.

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