9.7 Anogenital lumps and bumps 1613

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ESSENTIALS Anogenital lesions can be due to sexually transmitted infections, physiological variants that worry the patient, or dermatological conditions unrelated to infection. The clinical diagnostic approach is based on the colour of the lesion and the skin layer involved (epidermis, dermis, or subcutaneous fat compartment). A strong element of pattern recognition is involved in accurate diagnosis. This can only be learnt with experience, but is essential for deter- mination of appropriate treatment. Introduction Sexually transmitted infections (STIs) cause significant mor- bidity and mortality worldwide. In 2008 it was estimated that there were approximately 499 million new cases of curable STI, namely those due to Treponema pallidum (syphilis), Neisseria gonorrhoeae, Chlamydia trachomatis, and Trichomonas vagina- lis, occurring every year throughout the world in men and women aged 15–49 years, with the largest proportion in the region of South and Southeast Asia, followed by sub-Saharan Africa, and then Latin American and the Caribbean. Many of these infec- tions are asymptomatic and undetected, enabling ongoing trans- mission. Some STIs cause symptoms, especially in the anogenital region, and therefore need to be considered in the differential diagnosis of patients presenting with anogenital lesions. As well as examination of the anogenital skin, a thorough patient history focusing on past STIs, STI treatments, and sexual risk behaviour (number of partners, sex of partners, sex techniques practised, condom use) is required. However, complaints of anogenital le- sions can be related to STIs, physiological variants that worry the patient, or dermatological manifestations unrelated to infection, hence dermatological expertise is needed for correct diagnosis and subsequent management of anogenital lesions. Clinical approach In this chapter the most common anogenital dermatological diagnoses are discussed using an approach based on the colour of the lesion and the skin layer involved. There is a strong element of pattern recognition involved in accurate diagnosis of skin le- sions that can only be learnt with experience. The three main skin layers are the epidermis, dermis, and subcutaneous fat compart- ment (Fig. 9.7.1). Lesions involving the epidermis affect the structure of the skin surface such as the skin lines. Increased epidermal cell turn- over can cause epidermal papules, hyperkeratosis, and/or scales. Moreover, epidermal lesions can affect the skin appendages such as hairs and skin glands. If pigment cells (melanocytes) are involved, the normal pigmentation is affected. In the case of an underlying inflammatory process

the dermal layer is normally involved. Dermal inflammation is characterized by redness, oedema, and skin induration and normally affects the adjacent epidermis causing scaling and deformation of the skin lines. Inflammation can affect the dermal-epidermal junction causing detachment of the epidermis leading to (subepidermal) vesicles and pustules. Vesicles can also arise as intraepidermal vesicles. Subcutaneous lesions normally do not affect the structure of the skin surface. They are more easily defined upon palpation and can be moved independently from the overlying skin layers. Cysts and hypodermal structures such as lymph and venous vessels can manifest as subcutaneous lesions. Superficial anogenital lesions affecting the epidermis and/or dermis Flesh-coloured lesions Skin tags (also known as squamous papillomas, fibroepithelial polyps, acrochordons) Skin tags are benign growths frequently found in skin folds such as the inguinal folds and the perianal area (Fig. 9.7.2). They can be associated with obesity. Skin tags need to be differentiated from genital warts. Whereas the latter are characterized by changes in the epidermal structures (loss of skin lines, verrucous surface), the skin surface is unaffected and smooth in skin tags. Sometimes genital warts/human papilloma virus (HPV) lesions can arise on the surface of skin tags. 9.7 Anogenital lumps and bumps Henry J.C. de Vries and Charles J.N. Lacey

Section 9 Sexually transmitted diseases 1614 Pearly penile papules/Vulvar vestibular papillomatosis Pearly penile papules (PPP) (Fig. 9.7.3) and the female equivalent, vulvar vestibular papillomatosis (VVP) (Fig. 9.7.4), are a normal anatomical variant and not a disease. The condition normally de- velops at the time of acquisition of secondary sexual characteristics. They normally go unnoticed until close inspection takes place for some reason (e.g. a concern of STI). PPP are found in 20% of men, especially uncircumcised men. PPP and VVP are skin-coloured, 1 mm, and sometimes elongated papules found, respectively, at the corona encircling the glans and on the lateral aspects of the vestibule. PPP and VVP can be mistaken for genital warts and should never be subject to ablative treatment. In contrast to warts, PPP and VVP are monomorphic with an even and symmetric distribution. The histopathological substrate of PPP and VVP are angiofibromata. Thick (hairless) skin Epidermis Superficial arteriovenous plexus Papillary dermis Reticular dermis Meissner’s corpuscle Sweat duct Deep arteriovenous plexus Subcutaneous fat Subcutis/hypodermis Dermis Dermal nerve fibres Eccrine sweat gland Eccrine sweat duct Hair follicle Sebaceous gland Arrector pilli muscle Dermal papillae Opening of sweat duct Hair shaft Pacinian corpuscle Eccrine sweet gland Thin (hairy) skin Fig. 9.7.1 The skin can be divided into three main layers: epidermis, dermis and subcutaneous fat (or hypodermis). Courtesy of Madhero88, available under the Creative Commons Attribution-Share Alike 3.0 Unported licence. Fig. 9.7.2 Perianal skin tags, also known as acrocordons, or mariskes. Courtesy of Tmalonetn, available under the Creative Commons Attribution 3.0 Unported licence. Fig. 9.7.3 Pearly penile papules, also known as Hirsuties papillaris coronae glandis.

9.7 Anogenital lumps and bumps 1615 Fordyce spots Fordyce spots are asymptomatic physiological ectopic sebaceous glands found in mucosal tissue (Fig. 9.7.5). Typically in females they are located on the labia majora. In men they are frequently found on the penile shaft and scrotum. Both manifestations con- sist of evenly distributed white, or yellow, or skin-coloured 1–2 mm papules. On close inspection, or with a magnifying glass, the fol- licle outlets can be appreciated. Fordyce spots should not be treated. Fordyce spots should be distinguished from Fox-Fordyce dis- ease, a pruritic inflammatory condition involving apocrine glands in large body folds, which can include the inguinal folds and pubic region, characterized by monomorphous skin-coloured follicular 1–2 mm papules. Anogenital warts Anogenital warts (also known as genital

warts, or condylomata acuminata) are one of the most common STIs and are caused by the low-risk HPV types 6 and 11. They are characterized by fili- form or verrucous, pink, skin-coloured, or pigmented papules, (Fig. 9.7.6). They are usually self-limiting. The main reason why medical help is sought is for cosmetic and psychological reasons, although anogenital warts can itch, bleed, and cause fissuring. There are several treatment options that can be divided into patient-administered topical options such as podophyllotoxin, imiquimod, and sinecatechins, and provider-administered abla- tive options such as liquid nitrogen, coagulation (electro, infrared, and/or laser), and trichloracetic acid application. Only a few ro- bust head-to-head comparative studies have been performed, and as a result varying treatment guidelines and algorithms exist. The choice of treatment should be decided in collaboration with the patient, based on the location of the warts and the patient's preference for the mode of administration. The treatment goal is to remove warts, rather than eliminating the virus. Most anogenital warts can be treated in a primary care setting. Referral to a med- ical specialist is indicated in case of children with anogenital warts, pregnancy, immunosuppression, large warts, treatment failure, internal warts, diagnostic problems, or a suspicion of neoplastic lesions. In some countries, national HPV vaccine campaigns have used the quadrivalent HPV vaccine that prevents HPV 6 and 11, and have shown dramatic decreases in the anogenital wart inci- dence in the heterosexual population. Molluscum contagiosum Molluscum contagiosum lesions are caused by the molluscum con- tagiosum virus (MCV) and are flesh-coloured dome shaped pap- ules, sometimes with a central indentation. Infection frequently occurs in childhood in the setting of normal school and social contact. When seen in adults they are usually sexually transmitted and occur in the anogenital area. If numerous, large (>3 mm) or atypical mollusca are found in adults, immunodeficiency should be excluded, especially HIV infection (Fig. 9.7.7). Shaving of genital hair can also lead to the spread of infection, with multiple molluscs arising in the shaved area. Condyloma lata Condyloma lata are one of the cutaneous manisfestations of sec- ondary syphilis. They arise in moist, occluded areas, such as the inguinal, perianal, or perivaginal region and appear as flat pap- ules with a moist, cauliflower-like, or velvety surface. These lesions Fig. 9.7.4 Vulvar vestibular papillomatosis. Source: STI outpatient clinic, GGD Amsterdam, Amsterdam, the Netherlands. Fig. 9.7.5 Fordyce spots on the labia majora (×5 colposcopic image). Source: Department of GU Medicine, General Infirmary, Leeds, UK. Fig. 9.7.6 Anogenital warts can have multiple manifestations. In this picture a flat and hyperpigmented lesion (left side) and comb-shaped, verrucous, flesh-coloured warts (right side) can be seen.
Source: Department of GU Medicine, Leeds, UK.

 contain numerous spirochetes, and are highly infectious, and are frequently dark ground microscopy positive (Fig. 9.7.8). Red lesions Angioma Angiomata are bright red, flat to dome-shaped, 1–6 mm in diam- eter papules appearing during young adulthood and increase in number with age. They appear especially in light-skinned persons, and sites of predilection are the trunk, including the pubic and genital area. Histopathology shows a benign proliferation of capil- lary vessels. Electrocautery can be considered for cosmetic reasons or in case of bleeding upon trauma. Angiokeratoma Angiokeratoma are 1–2 mm in diameter, smooth, dome- shaped papules occurring typically on the scrotal skin or labia majora. Sometimes they are connected to telangiectatic vessels (Fig. 9.7.9). Like angioma, the histopathological substrate is a benign proliferation of capillary vessels, but in angiokeratoma the overlying epidermis is thickened and shows elongated rete ridges. Numerous angiokeratoma located on the trunk can be found as symptom of Fabry's disease, a metabolic disorder. Lichen simplex chronicus Lichen simplex chronicus is characterized by intensely itchy hyperkeratotic, and sometimes crusty

plaques (Fig. 9.7.10). The lesions occur in patients who continuously scratch a specific skin region (often subconsciously), with lichenification and trauma as a result. The condition becomes chronic when the healing process produces an itch, leading to a vicious circle of scratching, traumatization, and further itching. Some patients indicate that they feel something present in the skin that needs to be removed. In these cases delusional parasitosis should be excluded. Other possible underlying psychological/psychiatric causes like anxiety, obsessive-compulsive disorder, and depression should also be ad- dressed. Treatment of lichen simplex chronicus can be difficult and is best managed in the hands of a dermatologist, often in a multi- disciplinary team setting.
Lichen planus Lichen planus is a chronic inflammatory disease affecting various cutaneous and mucosal surfaces, and occasionally presents in the anogenital area. The lesions tend to be pink papules or plaques, scaly, show white striae and may have a bluish/purplish hue. There are usually concomitant lichen planus lesions at other body sites. Mucosal ulcerative disease is rare, but may be pre-malignant. Circinate balanitis C. trachomatis infection might rarely cause a reactive autoimmune arthritis, also known as sexually acquired reactive Fig. 9.7.7 Multiple large mollusca contagiosa as seen in a severely immunodeficient HIV-positive patient. Source: Department of GU Medicine, Leeds, UK. Fig. 9.7.8 Perianal condyloma lata in secondary syphilis. Hair growth in the lesion is not affected, in contrast to condyloma acuminata. Source: Department of GU Medicine, Leeds, UK. Fig. 9.7.9 Angiokeratoma of the scrotum. Courtesy of Jlcarter2, available under the Creative Commons Attribution-Share Alike 3.0 Unported licence.

 arthritis (SARA). SARA can be accompanied by characteristic skin signs including circinate balanitis, characterized by gyrate erythematous plaques with marginal scaling on the glans penis (Fig. 9.7.11). Other typical associated skin lesions are keratoderma blenorrhagica (i.e. hyperkeratotic plaques in the hand palms and foot soles), aphthous oral ulcers, and onycholysis. It is believed that pathogenic antigens stimulate an immune re- sponse with the production of cross-reacting autoantibodies that recognize host structures. As a consequence, sterile inflamma- tory reactions such as dermatitis, arthritis, conjunctivitis, and tenosynovitis occur. Intraepithelial neoplasia and squamous genital malignancy Squamous cell carcinoma (SCC) of the anogenital skin can occur at the cervix, vagina, vulva, penis, perianal area, and anal canal. Such lesions occur in otherwise healthy subjects but are more fre- quent in immunosuppressed patients (either HIV or iatrogenic), and some medical conditions such as diabetes and systemic lupus erythematosus (SLE). Anal carcinoma is markedly increased in HIV-infected men who have sex with men (MSM). SCC is strongly associated with persisting infections with high oncogenic risk HPV types. There is a spectrum of intraepithelial neoplasia at the various anogenital sites (e.g. CIN, VAIN, VIN, PIN, AIN located, respectively, at the cervix, vagina, vulva, penis, perianal area, and anal canal). Intraepithelial neoplasia is graded in increasing se- verity of neoplasia from 1 to 3 (Richart classification). The Bethesda classification is also used whereby squamous intraepithelial lesions are referred to as low-grade SIL (LSIL—HPV changes and IN1), and high-grade SIL (HSIL—IN 2 and 3). AIN can be visualized and characterized via high-resolution anoscopy (HRA) and dir- ected biopsy. Anogenital HSIL lesions that have progressed to in- vasive SCC are characterized by exophytic tumorous lesions and chronic ulceration (Fig. 9.7.12). Especially in ulcerative, atypical, and therapy-resistant anogenital warts, invasive disease should be excluded via histopathological analysis of suspected and represen- tative areas of the total lesion. Extramammary Paget’s disease Extramammary Paget’s disease is a rare condition but often occurs in the anogenital region, most commonly the vulva. Biopsies of the lesions show either adenocarcinoma in situ, with or without inva- sive adenomacarcinoma. The lesions are chronic, red,

and fissured, and might be mistaken as eczematous. The neoplasia is usually either arising directly from apocrine glands and skin append- ages, or associated with a local anogenital (e.g. rectum, bladder) adenocarcinoma. Pigmented lesions Dermatofibroma (aka histiocytoma) These are pigmented nodular lesions and can occur at any age. They can be single or multiple, are benign, and do not require treatment. Fig. 9.7.10 Excoriated, hypertrophic, and hyperkeratotic, fissured, and partly crusty plaques on the scrotum. Source: Department of Dermatology, Academic Medical Centre, University of Amsterdam, Amsterdam, the Netherlands Fig. 9.7.11 A autoreactive immunological manifestation in a patient with a urogenital Chlamydia trachomatis infection. Source: STI outpatient clinic, GGD Amsterdam, Amsterdam, the Netherlands. Fig. 9.7.12 HPV-induced perianal carcinoma in an HIV-positive patient. Source: STI outpatient clinic, GGD Amsterdam, Amsterdam, the Netherlands.

Section 9 Sexually transmitted diseases 1618 Benign melanocytic lesions (aka melanocytic naevi, moles, freckles) These can be congenital or acquired. They are frequently multiple. There are a great variety of forms, but specialist dermatological management is required for atypical or dysplastic naevi that might show asymmetry of shape or pigmentation, or recent change in appearance Bowenoid papulosis These are pigmented papules which show a reddish-brown to brownish-black pigmentation. The lesions are caused by high-risk HPV (usually HPV 16) and show high-grade intraepithelial neo- plasia. They can be admixed with more typical genital warts, and such red pigment change with HPV lesions should trigger biopsy and histopathological evaluation. Seborrhoeic keratosis (aka basal cell papilloma, seborrhoeic warts) Seborrhoeic keratoses occur all over the body and are increasingly common with age. They are often seen on the anterior abdominal wall, and are raised papules. They can be a variety of colours from grey to dark brown, they often have a waxy surface, and appear as if stuck to the skin like a barnacle. They are entirely benign. Pustular lesions Folliculitis Foliculitis can range from small pustular lesions arising in a hair follicle with only the presence of normal skin flora, to larger mul- tiple pustular lesions associated with staphylococcus or strepto- coccus and cellulitis. Bacterial culture should be performed for significant lesions, and oral antibiotics prescribed if there are signs of cellulitis. Genital herpes simplex/zoster Both genital herpes simplex virus (HSV) and varicella zoster virus (VZV) present with vesicular lesions that progress to ulcer- ation, accompanied by pain and often inguinal lymphadenopathy. Anogenital VZV is comparatively rare, tends to be more extensive, and with a dermatomal distribution. Primary HSV is usually much more widespread than recurrent HSV. Whereas primary genital herpes is caused by both HSV1 and HSV2, HSV2 predominates in recurrent disease. The initial diagnosis should be confirmed by HSV PCR. Hidradenitis suppurativa Hidradenitis suppurativa is an inflammatory condition of the apocrine glands. It can affect a variety of body sites including the inguinal and anogenital areas. There may be multiple com- edones, papules, abcesses, sinuses, and scarring. It may be asso- ciated with smoking, obesity, insulin resistance, Crohn’s disease, and various other factors. Specialist referral and management is indicated. Crusty lesions Scabies Scabies is caused by the ectoparasite Sarcoptes scabiei (scabies mites), and itch is the main symptom. The incubation period in a scabies naïve patient is two to six weeks; in case of repeat infec- tions, symptoms can occur sooner (1–4 days) due to sensitization to scabies antigens (via a delayed type hypersensitive T-cell-mediated response). Typical ‘burrows’ and excoriations can be found on the sites of predilection including the external genitalia, buttocks, and thighs, the interdigital space of the fingers, the lateral sides of the hand palms, the flexor side of the wrists, feet, armpits, and around the nipples. In the genital area, scabies normally pre- sents with larger (about 0.5–1 cm) pruritic papules (Fig. 9.7.13). Transmission occurs during skin-skin

contact lasting longer than 15 minutes, which is usual during sexual contact and almost never the case in everyday human interaction such as shaking hands. An exception to this rule is crusted scabies, a highly transmissible form of scabies characterized by numerous mites that can cause epidemic outbreaks within institutions where the index case is being hospitalized (Fig. 9.7.14). Crusted scabies is a hyperinfective condition characterized by hyperkeratotic crust- like lesions and can be seen in severely immunosuppressed (e.g. AIDS), paraplegic, and severely mentally disabled patients in a hospitalized setting. Plaque/flat lesions Psoriasis inversa Psoriasis is one of the most common diagnoses in the derma- tological practice, characterized by monomorphic erythemato-squamous plaques and papules. Psoriasis inversa is reserved for lesions in the genital area body folds including the peri- anal area (Figs. 9.7.15 and 9.7.16). Psoriasis is caused by an autoimmunological response directed towards the basal epi- dermal layer. T-cell immunity and the release of TNF-α are important factors in the inflammatory response. Different treat- ment modalities are available, but topical corticosteroid oint- ments are first line. Other options are ultraviolet (UV) light therapy, topical vitamin D derivatives, and oral immunosup- pressive drugs like methotrexate and cyclosporine. Fig. 9.7.13 Pruritic papules and nodules in the genital area are a hallmark for a scabies investation. Source: Department of Dermatology, Academic Medical Centre, University of Amsterdam, Amsterdam, the Netherlands.

9.7 Anogenital lumps and bumps 1619 Lichen sclerosus (aka lichen sclerosus et atrophicus (LS&A), balanitis xerotica obliterans (BXO)) Lichen sclerosus is an autoimmune condition frequently affecting the anogenital area. It affects both children and adults. The epithe- lium is thinned, white, fissures, and bleeds easily, and telangectasia might be seen within the lesions. Histopathology shows epidermal atrophy and a mononuclear cell lichenoid infiltrate in the dermis. It has a characteristic appearance and can often be diagnosed clin- ically. In men it frequently affects the foreskin causing phimosis; most circumcision specimens from young boys with phimosis show lichen sclerosus changes. In women it often affects the vulva, clitoris, and introitus. Treatment is with potent topical steroids such as clobetasol. In older women it is a pre-malignant condition, and perhaps half of all vulval SCCs arise in this setting. Intraepithelial neoplasia See ‘Intraepithelial neoplasia and squamous genital malignancy’, earlier. Syphilitic papules Syphilis is considered the ‘great imitator’, and can manifest itself in a spectrum of symptoms including genital lumps (Fig. 9.7.17). This is especially the case for the secondary stage. In a patient without pre- existing genital lesions, syphilis should be excluded, especially in MSM since they are most affected in the current syphilis epidemic. Deep palpable lesions not affecting the overlying skin (subcutaneous lesions): No loss of skin lines and appendages Cystic/nodular lesions Steatocystoma multiplex (epidermal cysts) Steatocystoma multiplex are epidermal cysts that occur as firm, dome-shaped smooth (0.5–2 cm in diameter) white to yellow-white flesh-coloured papules in the hair-bearing genital skin such as the scrotum or labia majora. If multiple cysts are present, the condition has the appearance of ‘a bag of marbles’ (Fig. 9.7.18). Epidermal cysts usually require no treatment unless for cosmetic reasons. Rarely the epidermal lining of the cyst ruptures, exposing its con- tent to the underlying dermis. As a result, a foreign body inflamma- tory response can occur that can mimic a furuncle. Inflamed cysts can be incised and drained. Epidermoid cysts (sebaceous cysts) Such cysts tend be single and are derived from sebaceous glands. Sometimes multiple cysts are seen on the scrotum or labia majora. Fig. 9.7.14 Highly infectious crusty lesions in a severely immunosuppressed HIV-positive patient wiith crusted scabies. Source: Department of Dermatology, Academic Medical Centre, University of Amsterdam, Amsterdam, the Netherlands. Fig. 9.7.15 Monomorphic sharply demarcated intensely erythematous plaque in the genital area of a new

born girl. Source: Department of Dermatology, Academic Medical Centre, University of Amsterdam, Amsterdam, the Netherlands. Fig. 9.7.16 Monomorphic sharply demarcated erythemato-squamous plaque in the inguinal groin area. Source: Department of Dermatology, Academic Medical Centre, University of Amsterdam, Amsterdam, the Netherlands.

Section 9 Sexually transmitted diseases 1620 They might rupture and resolve spontaneously. However, they are often regarded as a cosmetic problem and patients present re- questing their removal. If attempting excision, care must be taken to remove the entire capsule. Bartholin cysts, other cysts of the vestibular glands
and median raphe There are various sites in the anogenital area where normal glan- dular structures can develop cystic changes. The most common is a Bartholin's cyst, arising in the posterior third of the labium majus. Care should be taken to differentiate a Bartholin's cyst which is subacute/chronic, and noninflammatory, from a Bartholin's ab- scess, which is acute, can be associated with gonococcal or chla- mydial infection, and which might need urgent surgical drainage (Fig. 9.7.19). Oedema and swellings Sclerosing lymphangitis Sclerosing lymphangitis is characterized by a nonpainful subcuta- neous fluctuating or fibrotic cord-like structure in the penile cor- onal sulcus (Fig. 9.7.20). Although unproven, it is possibly a result of decompensation of lymphatic drainage caused by an inflam- matory process. It is usually found in sexually active men in their 20s to 40s following vigorous sexual intercourse or masturbation, probably resulting in mechanical trauma of the lymphatic appar- atus. In two-thirds of the patients with sclerosing lymphangitis, an STI is diagnosed. (a) (b) Fig. 9.7.17 (a and b) In secondary stage syphilis is characterized by a large variety of anogenital skin lesions. As a result any anogenital skin manifestation justifies syphilis diagnostics. Source: STI outpatient clinic, GGD Amsterdam, Amsterdam, the Netherlands. Fig. 9.7.18 Steatocystoma multiplex scrotalis. Source: Department of Dermatology, Academic Medical Centre, University of Amsterdam, Amsterdam, the Netherlands. Fig. 9.7.19 An inflamed Bartholin cyst in the right labia majora. This is an acute presentation with pain, fever, and discomfort. Source: Department of GU Medicine, Leeds, UK.

9.7 Anogenital lumps and bumps 1621 Mondor's disease Mondor's disease is a rare condition which is considered a thrombo- phlebitis of the subcutaneous veins. It commonly occurs on the anterolateral thoracoabdominal wall, but it can also occur on the penis, groin, antecubital fossa, and posterior cervical region. The clinical features are a sudden and typically asymptomatic onset of a cord-like induration, although some patients report a feeling of 'strain'. It is a self-limiting process that lasts a short period of time, which might be the reason why there are few reports about its diag- nosis and treatment. As with sclerosing lymphangitis, in patients with penile Mondor's disease it is essential to exclude STIs. Lymphogranuloma venereum Lymphogranuloma venereum (LGV) was considered an STI con- fined to equatorial regions until 2004, when an epidemic of LGV was reported among MSM in major cities throughout the Western world. LGV is caused by C. trachomatis-type L, and is associated with a severe invasive, destructive disease. If left untreated it can eventually lead to irreversible damage to the lymphatic system, strictures, and chronic pain syndromes in the pelvic region. Depending on the progression of the infection, three stages can be distinguished in LGV. The inoculation stage is characterized by an inconspicuous and short-lived ulcer at the inoculation site, and the regional stage by subsequent invasion of C. trachomatis in the submucosal tissue, causing a violent inflammatory reaction with oedema. In addition, C. trachomatis spreads via the lymphatics to regional lymph nodes where lymphadenopathy (bubo formation) occurs (Fig. 9.7.21). Necrosis in lymph nodes can lead to fluctu- ating abscesses that sometimes rupture and leave long-standing fistulae. Due to the extent of the

infection, many patients have sys- temic symptoms including malaise fever, weight loss, joint pains, possibly caused by a reactive arthritis. FURTHER READING Bunker CB (2004). Male genital skin disease, 1st edition. Saunders, Edinburgh/London. de Vrieze NH, de Vries HJ (2014). Lymphogranuloma venereum among men who have sex with men: an epidemiological and clin- ical review. Expert Rev Anti Infect Ther, 12, 697–704. Edwards L, Lynch PJ, Neill SM (2011). Genital dermatology atlas, 2nd edition. Lippincott Williams & Wilkins, Philadelphia. Fairley CK, et al. (2009). Rapid decline in presentations of genital warts after the implementation of a national quadrivalent human papillomavirus vaccination programme for young women. Sex Transm Infect, 85, 499–502. Gottlieb SL, et al. (2014). Toward global prevention of sexually trans- mitted infections (STIs): the need for STI vaccines. Vaccine, 32, 1527–35. Gupta S, Kumar B (2012). Sexually transmitted infections, 2nd edi- tion. Reed Elsevier, New Delhi. Holmes KK (2008). Sexually transmitted diseases, 4th edition. McGraw-Hill Medical, New York. Machalek DA, et al. (2012). Anal human papillomavirus infection and associated neoplastic lesions in men who have sex with men: a systematic review and meta-analysis. Lancet Oncol, 13, 487–500. Richel O, et al. (2015). Brief report: anal cancer in the HIV-positive population: slowly declining incidence after a decade of cART.
J Acquir Immune Defic Syndr, 69, 602–5. Youssef AF. (1984). Atlas of gynaecological diagnosis. Churchill Livingstone, Edinburgh/New York. Fig. 9.7.20 Sclerosing lymphangitis in the penile sulcus as a symptom of a urethral Neisseria gonorrhoeae infection. Source: STI outpatient clinic, GGD Amsterdam, Amsterdam, the Netherlands. Fig. 9.7.21 Inguinal lymphogranuloma venereum (LGV) with a bubo in the groin area. Source: Department of Dermatology, Academic Medical Centre, University of Amsterdam, Amsterdam, the Netherlands.

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