REVIEW

Male genital dermatoses in old age

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Abstract
This review aims to highlight the clinical features, diagnosis and treatment of the most common dermatoses of the male genitals in old age. Diseases of the male genitalia range from infectious problems to inflammatory and neoplastic dermatoses. These can affect sexual and urinary functions. The importance of the former in older men should not be underestimated. Pre-malignant and malignant penile lesions are discussed. Although rare, penis cancer is preventable and curable if diagnosed early.

Keywords: genital dermatoses, foreskin, circumcision, squamous cell carcinoma of the penis, elderly

The foreskin in health and disease
The prepuce is a specialised protective and erogenous structure. The protection it affords is both physical and immunological. It has been estimated that globally 25% of men have been circumcised [1]. Data from our clinic suggest that circumcision protects against inflammatory genital dermatoses including psoriasis, seborrhoeic dermatitis, lichen planus and lichen sclerosus; about 50% of men attending general clinics were uncircumcised, whereas uncircumcised men were in the majority in the penis clinic [1]. Circumcision can be a contentious issue but is indispensable in the management of disease of the penis and foreskin, including dermatological conditions [2]. In older circumcised men, obesity and the vanishing penis can result in the phenomenon of the ‘pseudo-foreskin’ where the skin of the penile shaft partially or totally envelopes the glans penis (see Appendix 1 in the supplementary data on the journal’s website http://www.ageing.oxfordjournals.org/). Such a situation is prone to all the complications and dermatoses found in the uncircumcised state.

Balanitis, posthitis and inflammatory dermatoses
Balanitis describes inflammation of the glans penis; posthitis, inflammation of the prepuce [3]. Generally, dermatologists feel that balanitis, posthitis and balanoposthitis are probably more common due to inflammatory and pre-cancerous dermatoses than genitourinary physicians who teach that most cases are due to infection with candida.

Zoon’s balanitis
Zoon’s plasma cell balanitis is a relatively common disorder of the older uncircumcised male [4]. The evidence suggests that Zoon’s balanitis is a chronic, reactive, principally irritant mucositis related to a dysfunctional prepuce (i.e. a foreskin failing in its functions as defined in paragraph 1) [5]. Dribbling and then retention of urine and friction from shed squames between two tightly apposed and infrequently and inadequately separated and/or inappropriately bathed, commensally hyper-colonised, desquamative, and secretory epithelial surfaces create the dermatosis [1].

The presentation is often indolent and asymptomatic. Staining of the underclothes with blood may be reported but many patients are indifferent to the problem. Well-demarcated, symmetrical glistening, moist, shiny, bright-red or autumn-brown patches involve the glans and mucosal prepuce [6]. There is no involvement of the keratinised penile shaft or keratinised foreskin (Figure 1).

The classical histology is of epidermal attenuation (absent granular and horny layers), diamond-shaped or lozenge-shaped basal cell keratinocytes with sparse dyskeratosis and spongiosis. There may be erosion or ulceration. There is a band of dermal infiltration with plasma cells of variable density and arguable specificity.

Although the condition may improve with altered washing habits and the intermittent application of mild or potent topical corticosteroid (+/- antibiotics and anti-candidals), Zoon’s balanitis usually persists or relapses. Definitive curative treatment is surgical circumcision.

The florid signs of Zoon’s may be secondary, thereby concealing more subtle evidence of underlying preputial
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Candidosis (thrush) may be present, we believe, as a secondary opportunistic phenomenon rather than as a primary cause of disease, in most if not all cases. Candidosis presents as an inter-trigo. Burning and soreness are likelier than itch. Coalescent red patches or plaques involve the folds often with superficial erosions. Obesity predisposes to candidal intertrigo but medical causes include diabetes mellitus, iatrogenic immunosuppression and systemic antibiotic treatment. Underlying disease should be identified and treated and predisposing factors rectified.

Preputial dysfunction is probably the cause in all cases of non-specific balanoposthitis and many will probably have lichen sclerosus as the underlying morbid state. Treatment can be very difficult with failure to respond to local toilet, soap substitution, topical steroids, and topical and systemic antibiotics. The ultimate recourse is circumcision, which is curative in most instances and provides further tissue for histological substantiation of the presumed underlying genital dermatosis.

Lichen sclerosus

Lichen sclerosus is a curious, chronic, inflammatory and scarring dermatosis with a predilection for the genitalia and a propensity to progress to squamous carcinoma [1, 5]. Genital lichen sclerosus, like extra-genital disease, can manifest as atrophic white patches or plaques (Figure 2), or as hypertrophic, lilac, slightly scaly lichenoid patches or plaques with telangiectasia and sparse purpura. Very potent topical corticosteroid used under supervision is effective. It is not known for certain what impact medical and surgical treatment has on the subsequent incidence of penile carcinoma. In our clinic, not 1 of 300 patients has progressed to cancer over 10 years of follow-up but the published cancer risk is as
high as 10% [5, 8, 9]. Patients should be followed up long-term, especially if circumcision has not been performed or if symptoms persist or recur after any modality of treatment.

**Pre-malignant and malignant penile lesions**

Erythroplasia of Queyrat (EQ) and Bowen’s disease (BD) are three clinical variants of squamous carcinoma in situ of the penis [10–12]. BP occurs mainly in young sexually active men. EQ and BDP occur in predominantly uncircumcised, older men. Although EQ and BDP are synonymous in describing carcinoma in situ of the penis, Bowen’s disease (BD) is used to refer to squamous cell carcinoma in situ at other cutaneous sites (as originally described by Bowen in 1912) and in a dermatologist’s mind is associated with multi-focal disease, prior arsenic ingestion or sunlight exposure. We think that EQ should be used to describe red, shiny patches or plaques of the genital mucosa sites (glans and prepuce of the uncircumcised male) and BDP for red scaly patches and plaques of the keratinised penis [1]. This distinction has not always been made in the literature.

The aetiology of EQ and BDP is unknown. The natural history, as defined by Graham and Helwig [13] would be consistent with a local carcinogenic influence in uncircumcised men; smegma has been proposed as that factor with additional contributions from poor hygiene, trauma, friction, heat, maceration and inflammation. Circumcision protects against penile cancer for which phimosis and balanitis are known risk factors. Poor hygiene and phimosis may lead to the retention of smegma, but the carcinogenicity of human smegma has not been ascertained. Human papillomavirus (HPV) is found in the majority of cases of BDP and BP (particularly type 16, but also other types) and also 15–80% of penile cancers [1, 14]. HPV types 16, 18 and 33 are considered the most oncogenic.

Clinically, EQ presents as a disorder of the glans prepuce of the penis. Patients usually complain of pruritus, pain, bleeding and difficulty in retracting the foreskin. Lesions are asymmetrical, barely raised, well defined, red, shiny, velvety, plaques on the glans penis or mucosal prepuce [15].

In contradistinction, BDP presents as a red, possibly slightly pigmented and scaly plaque of the keratinised penile shaft or proximal prepuce. It can be found around the anogenital skin including the groin. There may be several foci of EQ and BDP and they may occur concomitantly.

Frank squamous cell carcinoma with invasion and metastases may eventually occur. The grade of the intraepithelial neoplasia and the development of invasive carcinoma are related to age [14]. The risk for progression to invasive cancer is said to be higher for EQ (approximately 30%) than BDP [16].

Evidence regarding specific treatments and their outcomes are scanty. Most treatment modalities are used on an empirical basis, with few comparative studies or long-term follow-up data. We believe that treatment should begin with circumcision, as this removes a major risk factor for cancer. Topical 5 fluorouracil (5FU) as a 5% cream has long been regarded as a conventional option for the treatment of BDP/EQ/BP [1]. A useful clinical regimen is to use cyclic 5FU and topical corticosteroid treatment: for example, the patient is told to use 5FU once daily on the affected part for several days until the area is red and sore. Then potent topical corticosteroid cream (perhaps containing an antibiotic and anti-fungal) is used until the area is quiet again and the 5FU treatment resumed [1]. Patients are monitored closely and even in remission followed up closely.

Other treatments include cryosurgery, curettage and electrocautery, excisional surgery, radiotherapy (which has a poor reputation in this scenario), Mohs micrographic surgery, laser and topical or systemic photodynamic therapy [1, 12]. Topical imiquimod, an immune response-modifying agent with anti-viral and anti-tumour activity, is currently attracting much interest and shows some potential [17, 18]. Follow-up should be long-term.

**Squamous cell carcinoma of the penis**

Squamous cell carcinoma (SCC) accounts for 95% of penile neoplasms. It results in 100 deaths per year in the United Kingdom and this rate has been unchanged over several decades [1]. The presence of a foreskin confers cancer risk. Carcinoma of the penis is commoner in males in underdeveloped countries or in areas where early circumcision is not routinely practiced [19]. Other factors are important in the carcinogenesis (Table 1) [1, 19, 20]. Approximately 50% are associated with lichen sclerosus and 50% with HPV.

<table>
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<th>Table 1. Risk factors for squamous carcinoma of the penis</th>
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<td>Uncircumcised state</td>
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<td>Phimosis</td>
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<td>Poor hygiene</td>
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<td>Chronic irritation, inflammation, scarring</td>
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<td>Smoking</td>
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<td>Lichen sclerosus⁴</td>
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<td>Lichen planus</td>
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<td>Human papilloma virus (HPV)⁴</td>
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<td>Squamous hyperplasia</td>
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<td>Bowen’s disease</td>
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<td>Erythroplasia of Queyrat</td>
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<td>Bowenoid papulosis</td>
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<td>Giant condyloma/verrucous carcinoma</td>
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<td>Systemic lupus erythematosus</td>
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<td>Radiotherapy</td>
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⁴ In practice approximately 50% are lichen sclerosus and 50% are HPV related.
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Itch, irritation, pain, bleeding, discharge, ulceration or the discovery of a lump presage SCC. There is usually a long history of problems with the penis and foreskin amounting to dyspareunia, balanoposthitis or phimosis and dysuria. Irregular nodular and ulcerative morphology are the cardinal signs (Figure 3) [1]. Background BDP/EQ/BP or lichen sclerosus may be appreciated. The presence or absence of inguinal lymphadenopathy should be ascertained and investigated.

The diagnosis of SCC is confirmed by biopsy. Histology shows tongues of invasive atypical keratinocytes invading the dermis and foci of aberrant and ectopic keratinisation called squamous pearls.

Early diagnosis of the pre-cancerous dermatoses and established SCC is important to prevent death and minimise the morbidity of treatment. When diagnosed early, cure is achievable in most patients. The treatment of penile carcinoma depends on tumour staging and is not generally the province of the dermatologist. The two main staging classifications used are the Jackson and TNM classification [21]. The latter describes the depth of invasion and the extent of nodal involvement. The main prognostic factors in penile SCC are the extent of the primary lesion, tumour differentiation and the lymph node status. The extent of nodal involvement adversely affects survival [21]. Five-year disease-free survival rates of 95–100% have been reported in surgically staged patients with negative lymph nodes, decreasing to 80% when a single inguinal lymph node is involved, to 50% when multiple inguinal nodes are positive and to virtually 0% when perinodal extension or pelvic lymph node metastases occur [21].

Management includes surgery, radiotherapy and chemotherapy. There are no randomised trials that assist in making clinical decisions, thus evidence is based only on selected series. Surgical resection is the mainstay of treatment and in early stages of the disease, surgery alone may offer a high cure rate. Conventional radical approaches such as amputation are being replaced by more tissue-conserving techniques with plastic repair [21, 23]. Wide local excision, microscopically controlled surgery, laser therapy, external-beam radiation therapy and brachytherapy have all been used as organ-sparing alternatives. In the older man, an amputation may be considered less aggressive than in a younger patient, but sexual identity and activity are recognised increasingly to be important to older men as overall life expectancy and health in the aged improves. In patients with locally advanced disease, multi-modality approaches using adjuvant chemotherapy and radiation therapy have been used, but further studies are required [23].

Extra-mammary paget’s disease

Extra-mammary Paget’s disease is a rare but important dermatosis. It presents as an irritating, itchy, burning, red scaly patch or plaque and may be multi-focal (Figure 4) [1]. It can be found anywhere in the anogenital area including the glans penis. The differential diagnosis includes psoriasis and BDP. The disease behaves indolently, spreading by local extension and metastasis. Paget’s disease can be treated with cryotherapy and topical 5FU. Wide excisional surgery with plastic repair is probably the treatment of choice but, based on anecdotal evidence, topical imiquimod seems promising as a non-invasive alternative [24].

Key points

- Diseases of the male genitalia can affect sexual and urinary functions: the importance of the former in older men should not be disregarded.
- A primary dermatosis (such as psoriasis, seborrhoeic dermatitis, Zoon’s balanitis, lichen sclerosus or carcinoma

Figure 3. Neglected penis cancer in an 82-year-old man.

Figure 4. Two nummular psoriasiform plaques of extra-mammary Paget’s Disease.
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*in situ*) is often present in cases of non-specific balanoposthitis.

- Circumcision is indispensable in the management of disease of the penis and foreskin, including dermatological conditions.
- Suspected pre-malignant penile lesions demand prompt dermatological assessment.
- All penile squamous cell carcinoma (SCC) should be preventable.

**Supplementary data**

Supplementary data for this article are available at *Age and Ageing* online.

**References**


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