Genital manifestations of tropical diseases

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Genital symptoms in tropical countries and among returned travellers can arise from a variety of bacterial, protozoal, and helminthic infections which are not usually sexually transmitted. The symptoms may mimic classic sexually transmitted infections (STIs) by producing ulceration (for example, amoebiasis, leishmaniasis), wart-like lesions (schistosomiasis), or lesions of the upper genital tract (epididymo-orchitis caused by tuberculosis, leprosy, and brucellosis; salpingitis as a result of tuberculosis, amoebiasis, and schistosomiasis). A variety of other genital symptoms less suggestive of STI are also seen in tropical countries. These include hydrocele (seen with filariasis), which can be no less stigmatising than STI, haemospermia (seen with schistosomiasis), and hypogonadism (which may occur in lepromatous leprosy). This article deals in turn with genital manifestations of filariasis, schistosomiasis, amoebiasis, leishmaniasis, tuberculosis and leprosy and gives clinical presentation, diagnosis, and treatment.
infection leads initially to asymptomatic lymphangectasia. The death of adult worms provokes acute inflammation and lymphatic dysfunction and the late effects of disease result from superimposed bacterial infection in areas of lymphatic dysfunction. The specific clinical features that result from these processes in the genital area are described in table 1.

The psychosocial impact of filariasis (table 2) has been highlighted in recent research carried out in Brazil and Nigeria.

The diagnosis is usually made by demonstrating the presence of microfilaria in peripheral night blood samples, for which a variety of techniques are available. Adult worms within the scrotum can be demonstrated by ultrasound with a 7.5 MHz transducer. Demonstrating microfilaria becomes more difficult in late stage disease. Antibody and antigen detection techniques are available in special centres. One study conducted in an endemic area showed that 37% of men initially reported as amicrofilaraemic in a 60 ml capillary sample could be shown to have filariasis by testing larger blood volumes or by scrotal ultrasound for adult worms.

Diethylcarbamazine (DEC) in three divided doses of 6 mg/kg/day for 12 days kills adults and microfilariae. The death of worms can provoke quite intense systemic and local reactions but does not generally require withdrawal of treatment. DEC treatment alone does not produce regression of hydroceles. Ivermectin is effective only against microfilariae and has an important role in control programmes. Surgery for scrotal elephantiasis produces much more satisfactory results than surgery for elephantiasis of the legs. Studies from Ghana have shown that surgery for hydrocele brings marked improvements in physical and social wellbeing, increases capacity for work and community participation, and merits much greater attention than it has so far received in endemic areas.

Aspiration followed by sclerotherapy with tetracycline offers a useful alternative method for dealing with thin walled hydroceles. Good skin care and prompt treatment of bacterial skin infections is important to stop the disease progressing.

**Schistosomiasis**

Schistosomiasis comprises a group of helminth infections characterised principally by extensive egg shedding into the bladder (mainly *Schistosoma haematobium*) or rectum (mainly *S mansoni* and *S japonicum*) by adults worms residing in nearby venous plexuses. The inflammatory reaction to soluble egg antigens released through pores in the walls of eggs that become lodged in tissue produces a wide array of symptoms, notably haematuria and bloody diarrhoea, and sequelae such as periportal fibrosis. Genital complications of schistosomiasis are less well known but may have important implications for control of cervical cancer and HIV in women. Both sexes may develop genital complications but, in contrast with filariasis, the genital morbidity is much greater in women than men. Schistosomiasis is acquired by exposure to water colonised by various species of snail which act as intermediate hosts and which release into the water motile miracidia capable of penetrating human skin. The disease is believed to infect 193 million people in the tropics, with 85% of infections occurring in Africa. Each of the *Schistosoma* species that infects humans has a specific distribution related to local snail ecology.

**Table 1** Male genital manifestations of infection with *Wuchereria bancroftii*

<table>
<thead>
<tr>
<th>Manifestations</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Lymphangiectasia of lymphatics round the spermatic cords</td>
<td>Earliest sign of infection. Detectable by ultrasound in 80% of men found to have microfilaraemia. Initially asymptomatic</td>
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<tr>
<td>Acute hydrocele</td>
<td>Develops when adult worms die naturally or as a result of therapy</td>
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<tr>
<td>Chronic hydrocele</td>
<td>Detectable in up to 40% of males in areas hyperendemic for filariasis</td>
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<tr>
<td>Chylocele</td>
<td>Collection of chyle that forms when a lymphatic ruptures into a hydrocele</td>
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<tr>
<td>Lymph scrotum</td>
<td>Superficial scrotal lymphangiomatosis which may ooze chyle through deformed scrotal skin</td>
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<tr>
<td>Acute inflammation of scrotum and penis</td>
<td>May be triggered by death of adult worms or superimposed bacterial infection. Tender scrotal nodules or irregularity of spermatic cords may be felt</td>
</tr>
<tr>
<td>Elephantiasis of scrotum (fig 1)</td>
<td>Late hypertrophy and fibrosis that results from repeated bacterial infections. Urine flow not affected</td>
</tr>
<tr>
<td>Inguinal adenitis</td>
<td>Develops acutely when adult worms die. Also triggered by bacterial infections in genitalia or legs. Occasionally filarial abscess develops</td>
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**Table 2** Social impact of genital filariasis reported by Dreyer et al and Ahorlu et al

<table>
<thead>
<tr>
<th>Implication</th>
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<tr>
<td>Loss of physical intimacy</td>
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<tr>
<td>Difficulty in finding marriage partners</td>
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<tr>
<td>Conspiracy of silence, embarrassment, ridicule, loss of self esteem, reduced social interaction</td>
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<tr>
<td>Reduced work capacity</td>
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<tr>
<td>Loss of inheritance</td>
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<tr>
<td>Suicidal ideation</td>
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<tr>
<td>Dyspareunia in female partners resulting from penile deformity of infected male partners</td>
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</tbody>
</table>

Figure 1 Scrotal elephantiasis from Bancroftian filariasis. Patient being prepared for surgery in Papua New Guinea.
FGS an even more potent co-factor for HIV transmission than inflammation associated with schistosomiasis, could make mucosal lesions and this, coupled with the intensity of Africa develop cervical cancer under the age of 30 and development and spread of cervical cancer. Many women in effects of human papillomavirus infection, leading to swifter lesions. It has been postulated that FGS exacerbates the subepithelial calcification of ova are especially distinctive. It has been postulated that FGS exacerbates the effects of human papillomavirus infection, leading to swifter development and spread of cervical cancer. Many women in Africa develop cervical cancer under the age of 30 and Tanzanian studies have indicated high rates of FGS in the youngest women. Women with FGS may develop multiple mucosal lesions and this, coupled with the intensity of inflammation associated with schistosomiasis, could make FGS an even more potent co-factor for HIV transmission than sexually transmitted infections, which often cause less mucosal disruption and inflammation. The diagnosis is best made by the quantitative compressed biopsy technique (QCBT) which gives a better yield than histology or examination of urine specimens. A wet smear technique offers a means of rapid diagnosis in some cases. Eosinophil cationic protein (ECP) is elevated in patients with FGS and testing for the presence of ECP is being explored as a possible method of screening. Mild disease shows signs of regression within 9 weeks of a single dose of praziquantel 40 mg/kg. Where more extensive lesions are present 4–5 doses at 48 hour intervals have been recommended. 

**Male genital schistosomiasis**

The ability of schistosomiasis to cause bleeding and egg deposition within semen was first clearly demonstrated by the intrepid Claude Barlow who deliberately infected himself with cercariae in 1944 and then observed the development of haemospermia and the appearance of schistosome ova in his own semen. MacKenna et al reported how seven men from New Zealand attended a sexual health clinic in Christchurch complaining of either yellow discoloration (three cases), reduction in semen volume (two cases), or consistency (two cases). All the men had swum in Lake Malawi while travelling in Africa. Treatment with single dose praziquantel led to recovery in all cases. Other reports have described the development of haematospermia and lumpy semen in men with schistosomiasis. 

**AMOEBIASIS**

The classic effects of infection with *Entamoeba histolytica* are the development of a colitis that gives rise to amoebic dysentery, colitis, and liver abscess when organisms enter the portal system. *E histolytica* has also been reported as a cause of genital ulcer. In a review of 148 case reports of genital amoebiasis confirmed by observation of *E histolytica* published between 1924 and 1997, Antony and Lopez-Po noted that 85% of reports were of genital infection in females, including infants. Female genital amoebiasis is characterised by a foul, bloody vaginal discharge. In one third abdominal pain was reported and 8.1% had genital ulceration, often mimicking carcinoma of cervix, although in some cases amoebiasis and carcinoma have been found together. Involvement of uterus and tubes has also been reported; 92% of cases were diagnosed in cervical cytology specimens and the remainder by ulcer biopsy. Eighty six per cent of cases in men presented as a painful, discharging ulcer (fig 3), again often mimicking carcinoma and the remainder with discharge or dysuria. The diagnosis in men was made by biopsy, culture, smear, or wet preparation. In addition to these methods serological tests and nucleic acid amplification tests are now available to diagnose amoebiasis. Genital amoebiasis lesions generally respond swiftly to a standard course of metronidazole treatment (800 mg three times daily for 5 days). Neglected cases have progressed to necrotising vulvitis requiring radical vulvectomy. The infection can be sexually transmitted and sexual partners of patients with genital amoebiasis should be examined and offered treatment. 

**CUTANEOUS LEISHMANIASIS**

The leishmaniases are a group of diseases caused by protozoa of the *Leishmania* genus that affect 1–2 million people per year between latitudes 45° north and 32° south. Each species
Infection of the male genitalia is believed to originate in most cases from renal foci which shed bacteria down the ureters to the prostate, followed by canicular or lymphatic spread to the epididymis, vas, urethra, and testis. Haematogenous spread to these sites is also possible in cases of miliary infection. Sexual transmission of tuberculosis from women to men has not been recorded although sexual transmission in the opposite direction has been described. Cases of tuberculosis epididymitis account for most reports of male genital tuberculosis. Infection on one side is often followed the appearance of disease on the other side. Epididymitis commences with the gradual onset of swelling, followed by pain. Acute infections have occasionally been described. Tethering to scrotal skin may arise with later development of discharging scrotal fistulae. Involvement of the testis is usually a late feature. Examination shows an enlarged, irregular, nodular epididymis. Tuberculous involvement of the prostate may manifest with dysuria, frequency, haematuria, and haemospermia. Examination may reveal firm, irregular enlargement, nodularity, or soft areas of necrosis. Confirmation of the diagnosis may be made by detection of acid fast bacilli or positive cultures from urine, semen, pus, or biopsy specimens or by biopsy histology. Common additional findings include a sterile pyuria and the demonstration of focal calcification by ultrasound or radiology. All patients should be screened for the presence of pulmonary and renal lesions. Treatment is generally with conventional courses of tuberculosis chemotherapy. Surgery may be required to deal with abscesses, obstructive symptoms, or failures of chemotherapy.

**Female genital tuberculosis**

Primary or secondary infertility is the most common presentation. In developing countries tuberculosis may account for 5–20% of tubal infertility. Both tubes are likely to be affected but endometrial disease is not always present. Presentation with pain or abnormal bleeding occurs in postmenopausal women. Pelvic tuberculosis can also simulate ovarian carcinoma. Culture of menstrual fluid was found more useful for diagnosis than endometrial biopsy or culture in one large South African study. In this study it was also noted that the chest x ray was normal in 93% of women and there were no abnormal findings on examination in over 50%. PCR methods have recently been found useful for diagnosis of culture negative cases. The prognosis for fertility following tuberculous salpingitis is poor and the risk of ectopic pregnancy is increased. Less common manifestations of genital tuberculosis in women are tuberculosis of the cervix, which can mimic carcinoma and donovanosis. Tuberculous ulceration of the vulva is rare. It presents as chronic, painful genital ulceration and may be accompanied by scarring and sinuses; 100 cases were reviewed by Pardini in 1949.

**LEPROSY**

Leprosy is a mycobacterial disease affecting about one million people in the tropics. It is largely limited to skin, nasal cavity, and peripheral nerves by the preferential growth of *Mycobacterium leprae* at temperatures of 27–30°C. The scrotal contents, by virtue of their lower temperature, are susceptible to infection among patients who develop the lepromatous form of the disease and during episodes of erythema nodosum leprosum (type 2 reactions). These patients may initially experience episodes of testicular pain or swelling, even before any other manifestations are observed. The subsequent development of testicular atrophy, gynaecomastia, and loss of body hair are well known features of established lepromatous leprosy. Infertility and sexual dysfunction develop as the testes become small, soft, and

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**GENITAL TUBERCULOSIS**

**Male genital tuberculosis**

Important genital manifestations of tuberculosis in men are summarised in table 4.
insensitive and investigation may demonstrate oligospermia or azoospermia as well as elevated levels of luteinising hormone and follicle stimulating hormone and reduced testosterone. Patients with tuberculoid and other forms of leprosy occasionally develop skin lesions of the penis and scrotum that might be confused with STI. Leprosy is diagnosed by clinical findings (especially the presence of peripheral nerve thickening) supplemented by slit skin smears to look for acid fast bacilli. Most patients with leprosy are treated with multidrug regimens following the recommendations of the WHO.

**MISCELLANEA**

Brucellosis is an important cause of epididymo-orchitis among cattle dealers and those who drink unpasteurised milk in endemic areas. Isolation of *Brucella melitensis* from semen and sexual transmission to female partners has been reported. The diagnosis is suggested by associated fever and rheumatological symptoms and may be confirmed by culture, serology, and epididymal aspiration. Recommended treatment for brucellosis is 6 weeks of doxycycline with 3 weeks of streptomycin.

Physicians working in south and South East Asia will be familiar with so called semen loss syndromes, characterised by weakness, fatigue, and the conviction that this is linked to involuntary semen loss. Much has been written about this syndrome in India where it is referred to as “dhat,” or, more misleadingly, prostatorrhoea. No organic basis has been identified and it is most easily understood in terms of cultural concepts of semen and vitality. Depression scores are elevated among patients diagnosed with dhat. Rather more dramatic are occasional “epidemics” of a disease known as “koro,” characterised by a delusion in men that their genitalia are shrinking inwards and that they may die as a result. An outbreak in north eastern Thailand in 1976 led 200 people to attend hospital.

**REFERENCES**

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