

## Lesions and Neoplasms of the Scrotum and its Contents: A Review

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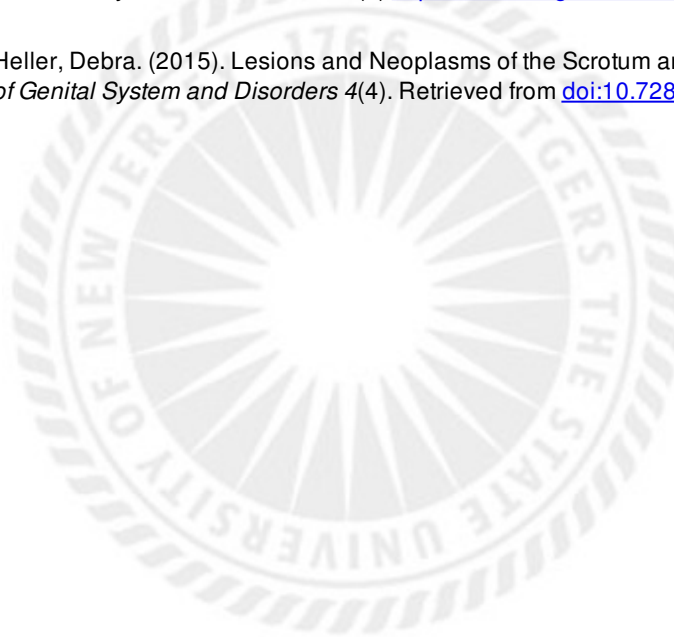
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Lesions & Neoplasms of the Scrotum & its Contents-A Review

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Precis:

Lesions and Neoplasms of the scrotum and its contents are reviewed.

**Abstract:**

A review of the scope of scrotal and testicular lesions and neoplasms that may present are presented to assist in developing a differential diagnosis if a patient with such a lesion is encountered. A familiarity will assist with recognition, as well as when consultation is needed.

Key words: Scrotum, testis, testicular neoplasms, genital diseases, male.

## **Introduction:**

In addition to urologists and other practitioners who care predominantly for male patients, with the increased use of high resolution anoscopy, practitioners who primarily care for women are seeing more men as well. Some obstetrics & gynecology practitioners, who are trained in colposcopy, have begun to train in high resolution anoscopy, recognizing that human papillomavirus disease is a field effect. Some of these practitioners are now being referred male patients as well for anoscopy, and they may be less familiar with conditions of the male external genitalia. This review is provided to provide familiarity of some of the more commonly encountered as well as significant lesions that may be seen. Penile lesions have been reviewed separately(1). This review is aimed to assist in developing a differential diagnosis if a patient with a lesion of the scrotum or its contents is encountered. A familiarity will assist with recognition, as well as when consultation is needed.

## **Anatomy & Histology**

The basic anatomy of the scrotum and its contents is seen in figure 1(author rendition).

## **Evaluation of Scrotal Symptomatology.**

A basic competence with a history and physical examination of the scrotum , particularly in the primary care setting, is necessary, and a recent review is available(2). History is very important in the evaluation of a scrotal mass, and includes how the mass was discovered, any trauma, pain, urinary symptoms, fevers, growth of mass, history of prior scrotal issues, and related family history (2). Among the commonest scrotal symptoms bringing men to their practitioner are pain

or a mass. Most extra testicular masses within the scrotum are benign, however testicular masses are malignant until proven otherwise(3). Ultrasound is a valuable modality in evaluation of scrotal disease(3). Transillumination may objectify a hydrocele (2) or other cystic mass.

## **Lesions and Neoplasms of the Scrotum**

### **Trauma**

Acute trauma uncommonly affects the scrotum, and scrotal trauma when it does occur is usually due to blunt force trauma(4). Aside from risks of acute trauma, bicycle riding may be associated with chronic genital trauma, including scrotal numbness due to pudendal compression, associated with regional genital (penile, perineal) numbness, as well as sometimes with erectile dysfunction. Interference with scrotal thermoregulation, both by the bicycling itself, and the associated tight supportive clothing, can interfere with fertility(5). Scrotal calculi, and a variety of abnormalities of scrotal contents were described as increased on ultrasound of bikers versus nonbikers(6).

### **Pain**

Acute onset of scrotal pain may indicate torsion of the spermatic cord, or torsion of the testicular or epididymal appendages particularly in adolescents, and can be accompanied by vomiting and low grade fever, particularly with torsion of the spermatic cord(7). Rapid intervention is important because testicular viability decreases significantly after 12 hours of torsion(3).

Lesser degrees of pain, particularly if unilateral, can indicate chlamydial or gonorrheal epididymo-orchitis, which can be evaluated with urethral smear, urine culture, and tests for the specific organisms(8). Epididymitis may also be secondary to urinary pathogens(9). Performance of testicular elevation to assess whether or not this improves the pain is important in the evaluation, as pain relief(positive Prehn's sign) is associated with epididymitis, while torsion will not be relieved, and may even worsen.

Chronic scrotal pain can have a significant impact on patient quality of life. The underlying etiologies are broad, and include but are not limited to infection, including epididymitis, orchitis and prostatitis, prior vasectomy, referred pain, prior trauma or torsion, varicocele, hydrocele, inguinal hernia, and idiopathic pain(10). Infectious epididymitis may be caused by tuberculosis, and require multi-drug therapy. Conservative therapies for idiopathic pain are usually attempted first including NSAIDs, antibiotics, and testicular elevation, with addition of neuromodulators, transcutaneous electrical nerve stimulation, and local injections among options that have been added before going to surgical options(10). Chronic perceived scrotal pain may actually relate to the contents of the scrotum, and a recent review has provided an evaluation algorithm(11).

## **Scrotal Dermatitis**

There is a wide range of dermatologic conditions that can affect the scrotum. Practitioners may assume that a dermatitis in the region is related to fungal infection. The scrotum is prone to both allergic and irritant dermatitis, as well as a variety of sexually transmitted diseases, infestations, dermatologic diseases, and secondary dermatitis due to medical conditions such as diabetes or chronic renal failure(12). Scratching, the dependent position of the scrotum, sweating and

occlusion of the region may add to the problem, and lichen simplex chronicus(squamous cell hyperplasia) can occur on the scrotum. A clinical review of the problem is available(12).

A unique condition is the red scrotum syndrome, characterized by redness, itching and burning. It is thought to be secondary to topical steroid overuse, and has been treated with cessation of steroid, and the addition of doxycycline in combination with amitriptyline or pregabalin(13). One author recommends doxycycline as primary therapy, with gabapentin as second line treatment(14). The differential diagnosis of this condition includes other dermatoses, including atopic dermatitis, contact dermatitis, psoriasis, tinea, syphilis, and other rare conditions(14).

## **Inflammatory and Infectious Conditions of the Scrotum**

### **Hidradenitis Suppurativa**

Hidradenitis suppurativa may affect the scrotum and perineum, and in severe cases require surgical excision. Clinically, there is severe inflammation with draining sinuses. Histology is nonspecific. Inflammation tends to be near apocrine glands, but whether they are the cause of the condition or merely a bystander has not been established.

### **Sexually Transmitted Diseases**

Condyloma acuminata may affect the scrotum, as may Molluscum contagiosum, herpes and syphilis. Chlamydia and gonorrheal epididymo-orchitis may present with scrotal pain.



## **Fournier's Gangrene**

Necrotizing fasciitis of the perineum and scrotum is a medical emergency, and is commonly associated with diabetes and immunocompromise(3). Emergency debridement with hyperbaric oxygen therapy can be lifesaving.

## **Scrotal Calcinosis**

Solitary or multiple calcific nodules may be present in the scrotum, and while usually asymptomatic, pruritis, heaviness, and discharge have been reported(15). Theories of etiology have included idiopathic, dystrophic calcification of the Dartos muscle, calcification of epidermal inclusion cysts, or eccrine ducts(15). These calcific nodules can be surgically excised, as seen in this photomicrograph of an excised lesion(figure 2). Histopathological evaluation of the resected lesions are necessary to rule out a malignancy. Occasionally loose scrotal "pearls" may float free within the tunica vaginalis(3), and may relate to microtrauma, as evidenced by the high incidence in bikers(16).

## **Scrotal Cysts**

The most common scrotal cysts are epidermal inclusion cysts. They usually don't require therapy, but may be excised if desired or symptomatic.

## **Massive Localized Lymphedema(MLL) of the Scrotum**

A condition that can occur in the vulva as well, MLL is associated with obesity. The localized lymphedema may be associated with problems with urination and sexual function, as well as ulceration and infection(17). Clinically, the scrotum is enlarged, swollen, with a “peau d’orange” appearance. Worldwide, elephantiasis(massive lymphedema of the scrotum) is usually secondary to filariasis(18). An example of an excised scrotum with massive lymphedema is shown in figure 3. Treated with scrotoplasty, the MLL may recur.

## **Benign Neoplasms of the Scrotum**

Leiomyomas are uncommon scrotal neoplasms arising from the dartos muscle(19), spermatic cord, tunica albuginea or epididymis(16). Angiokeratomas are dark purple small lesions that are comprised of dilated vessels with overlying hyperkeratosis. They may be single or multiple. Although usually asymptomatic, rarely they may bleed(20), and be treated by excision or local destructive methods. Nevi, fibroepithelial papillomas(skin tag) and lipomas may also affect the scrotum.

## **Premalignant and Malignant Neoplasms of the Scrotum**

### **HSIL and other intraepithelial neoplasia of the scrotum**

Squamous intraepithelial neoplasia of the scrotum is uncommon. Some cases are related to human papillomavirus. The LAST terminology classifies these lesions as LSIL for low grade/condylomatous lesions, and HSIL for high grade intraepithelial lesions respectively(21). LAST does not have any recommendations for superficially invasive squamous cell carcinoma of the scrotum due to its rarity and lack of literature.

Paget's disease may affect the scrotum, and appears as pruritic mixed white and red lesions that extend microscopically past the gross lesion. This may lead to positive margins on surgical excision. Paget's disease is an intraepithelial adenocarcinoma thought to arise from stem cells of skin adnexae.

### **Invasive carcinoma of the Scrotum**

Carcinoma of the scrotum occurs in about 1.5 per million person-years in developed countries(22). The most common invasive carcinoma of the scrotum is squamous cell carcinoma. Scrotal squamous cell carcinoma is very uncommon, and less than half of it is HPV-related(23). Most of it has been linked to chimney sweeps and other industrial exposures(21), as well as some of the treatments for psoriasis such as PUVA(psoralen plus ultraviolet A), and prior radiotherapy(22). The lesion presents as single or multiple nodule or plaques(23), so biopsy of worrisome lesions is important. Staging is the AJCC staging for cutaneous squamous cell carcinoma(21). Treatment is wide local excision, with sentinel node sampling(22, 23).Neoadjuvant chemotherapy and radiation have been utilized for larger lesions., as well as as

adjuvant therapy(22). Although the outcome can be good for early stage disease, it is poor for more advanced stages(22). Less commonly basal cell carcinoma, and sarcomas(24), including leiomyosarcoma and Kaposi's sarcoma(25) can affect the scrotum.

## **Lesions and Neoplasms of Scrotal Contents**

Some masses of the scrotal contents require more urgent referral than others. Ord et al divide such masses into cystic and solid, separate from testis and not separate from testis, and advising urgent intervention for a solid mass of the testis itself, a malignancy until proven otherwise(26), with a solid extra testicular mass also deserving of rapid attention. Cystic masses in general are less urgent, and often a combination of palpation and trans illumination can distinguish cystic from solid(26).

### **Hydrocele**

A hydrocele, a collection of fluid between the layers of the tunica vaginalis, may connect with the peritoneal cavity due to a patent processus vaginalis. This is also the mechanism of indirect inguinal hernia, where peritoneal contents can extend along the inguinal canal. There may also be non-communicating hydroceles if the processus vaginalis is closed. Hydroceles may be congenital or acquired, and are often asymptomatic. Some resolve spontaneously. A unique feature is that they can be transilluminated. Ultrasound is also a useful diagnostic modality. Noncommunicating hydroceles have been treated with aspiration and sclerotherapy, or with surgery, if symptomatic. Communicating hydroceles are treated surgically(10).

## **Varicocele**

Varicocele, due to dilated vessels of the pampiniform plexus is said to feel like a “bag of worms”. Varicoceles may deflate on lying down, are more prominent when the patient stands or performs a Valsalva maneuver(9) and may produce a dragging sensation. They may be associated with lower sperm counts(16), but it is controversial whether or not fertility is reduced(27), although they may be associated with male infertility(3), and are sometimes repaired as part of infertility treatment. Varicoceles can be corrected surgically(9) or with percutaneous embolization(28). Because of the vascular anatomy, a left varicocele in particular may reflect the presence of a renal cell carcinoma(29).

## **Extra-testicular Cystic Masses**

Simple cysts may arise from the tunica albuginea of the testis, or more commonly from the epididymis. They may also arise from the testis itself. Dilated ductules of the epididymis may form spermatoceles, particularly after vasectomy leads to obstruction(3).

## **Infection of the testis and epididymis**

Most epididymo-orchitis is bacterial, and may go on to testicular abscess. Urinary pathogens, chlamydia and gonorrhea are common culprits. Mumps orchitis can also occur, less commonly with utilization of vaccination, as well as orchitis related to syphilis and tuberculosis(3).

## **Benign Masses and Neoplasms of the Testis, Spermatic Cord and Epididymis.**

Epidermoid cyst of the testis is a benign ectodermally-derived neoplasm of the testis comprised of squamous epithelium and keratin debris(3), and differs from the epidermal inclusion cyst of the scrotum. However, the presence of other teratomatous elements elevates this neoplasm to at least low malignant potential in an adult, hence intraoperative frozen section may have a place if enucleation is considered rather than orchiectomy(3). Other occasional benign masses include Leydig cell hyperplasia, hamartomas, lipomas of the spermatic cord, epididymal adenomatoid tumors of mesothelial origin, as seen in this photomicrograph of an excised lesion (figure 4), epididymal leiomyoma, and adrenal rests(3,30). Epididymal papillary serous cystadenomas occur most frequently in the setting of Von Hippel Lindau syndrome(2).

## **Malignant Neoplasms of the Testis**

A testicular mass in a young man 25-35 years old is malignant until proven otherwise. Most testicular neoplasms in this group are germ cell tumors, divided into seminomas, and

nonseminomatous germ cell tumors. Stromal tumors of the testis are uncommon. Nontender firm enlargement of a testis requires urgent referral(31).

### **Conclusions:**

A review of the scope of neoplasms and lesions of the scrotum and its contents that may present to non-urologists is presented . As more gynecologists are practicing high resolution anoscopy, more referrals of male patients to these practitioners will occur, and familiarity with conditions of the male external genitalia is important. This will aid in recognition of lesions, as well as appropriate consultation.

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Legends:

Figure 1-Diagram of scrotum and contents

Figure 2-Scrotal calcinosis involving subcutaneous tissue

Figure 3-Peau d'orange appearance of scrotal lymphedema

Figure 4-Adenomatoid tumor, composed of numerous slit like spaces, highlighted by calretinin stain, which demonstrates their mesothelial nature.