

Multidisciplinary Approach of a Very Rare Infected Verrucous Carcinoma of the Scrotum

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Verrucous carcinoma of the scrotum is an extremely rare disease and most cases are thought to result from poor hygiene and chronic inflammation. Currently, it has not been well characterized, the etiology, diagnosis and treatment remaining poorly understood. We present the case of a 50-year-old male patient diagnosed with verrucous carcinoma of the right hemiscrotum. Wide surgical excision was performed. Favorable outcomes can be achieved by surgery, even without any adjuvant therapy, but patients should be carefully followed up.

Keywords: verrucous carcinoma, ciprofloxacin, bacteria

Verrucous carcinoma is an extremely rare [1] well-differentiated and low-grade tumor [2]. It is considered to be a form of squamous cell carcinoma (SCC), being identified by slow invasive growth with very rare regional lymph node metastasis. The etiology, diagnosis and treatment remain deficiently understood. Different eponyms have been used to describe it from Buschke-Loewenstein for anogenital lesions, Ackerman for tumors of the oral cavity to carcinoma cuniculatum for the malignancies on the sole of the foot. Most of the verrucous tumors are discovered on the plantar surface of the foot [3].

Verrucous carcinoma of the anogenital region can be described as a cauliflower-like tumor, with a high rate of recurrence and tendency to invade the deep structures. Just the histopathological examination can differentiate it from a condyloma. In general it appears in male and in immunocompromised patients. It is usually related with human papillomavirus (HPV), poor hygiene, low socio-economic status, alcohol consumption and chronic inflammations [4].

The literature about verrucous carcinoma is based on case reports and rarely on large-scale studies. In spite of that, surgical treatment is accepted as the main step in the management of treatment [1]. Regular follow-up is important due to high risk of recurrence.

We describe the case of a male patient with a verrucous carcinoma of the right hemiscrotum discussing the clinical and pathological characteristics associated with diagnosis and possibilities of treatment.

Experimental part

A 50-year-old male patient presented to the Department of Urology of Prof. Dr. Agrippa Ionescu Emergency Clinical

Hospital with profuse bleeding from the scrotal area. On physical examination a 12 cm infected tumor was revealed on the right hemiscrotum. The lesion grew in size in the past 4 years. He denied any urethral discharge, dysuria or sexual dysfunction, but he was sexually inactive. The patient was a non-smoker, he had no prior medical history and was not taking any regular medication.

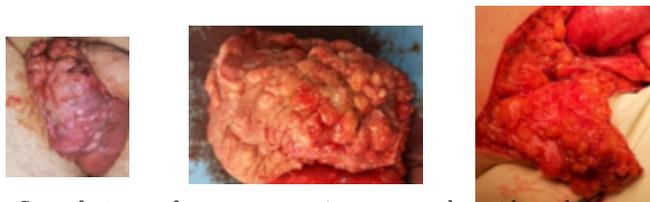
At that time blood test results revealed a serum creatinine of 0.99 mg/dl, serum hemoglobin (Hb) 12.1 g/dL, white blood cells 16100/il with 70.7% neutrophils. Wound cultures were performed and empirical antibiotherapy with ciprofloxacin 400 mg intravenous every 12 hours was started. We chose ciprofloxacin, as empirical antibiotherapy due to the fact that it is active against both Gram-positive and Gram-negative bacteria and it is used for the treatment of a wide range of infections.

It was considered necessary to perform a biopsy. The clinical evaluation of regional adenopathy was negative and the general clinical examination found a normal weight patient, in a good general condition, without any particular findings. Before biopsy a local ethical agreement and informed consent of the patient were obtained.

Histopathological examination of the tissue fragment, following incisional biopsy was suggestive for verrucous carcinoma. In order to evaluate the extension of the tumor a computed tomography was performed. This examination showed a tumoral mass with infiltration of the proximal third of the corpus cavernosum and the right testis. Moreover, there were described necrosis outbreaks. Considering the size, wide surgical excision of the tumor was decided and performed under spinal anesthesia. The surgical team was represented by one plastic surgeon and one urologist and they performed a right radical inguinal orchiectomy with the removal of the spermatic cord and the ligature of the neurovascular pedicle.

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Gross features of verrucous carcinoma - a polyp with cauliflower-like appearances (left and middle). Intraoperative picture (right)

Due to seroma formation, a wound dehiscence was observed 6 days post-operatively. The lesion was cleaned daily with antiseptic solutions and silver dressings were applied. Wound culture revealed *Proteus mirabilis* and antibiotherapy was continued with ciprofloxacin (C₁₇H₁₈FN₃O₃).

The evolution was favourable. The patient fully recovered after 20 days of hospitalization and left the urology department in a good clinical condition.

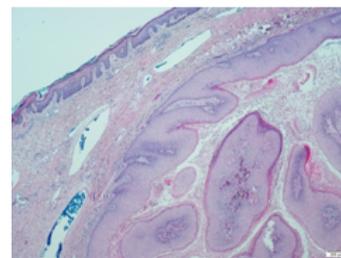
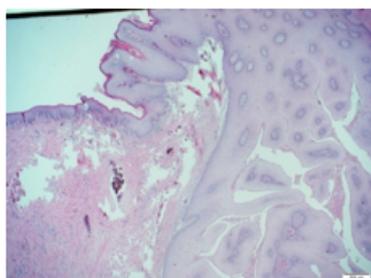
Six months follow-up showed a thin scar with no local recurrence and no local discomfort.

Results and discussions

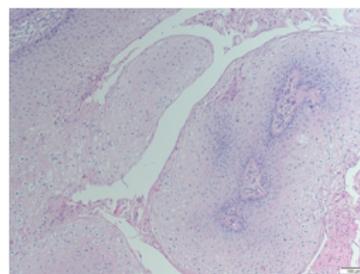
Scrotal squamous cell carcinoma is considered to be the first cancer linked to occupational exposure to a carcinogen. In the eighteenth century, there were three main occupational groups diagnosed with the disease: chimney sweeps, people who worked with the distillates of coal and men exposed to mineral oil. The carcinogenic factor was represented by the polycyclic aromatic hydrocarbons in soots, tars and mineral oils. In 1775, the English surgeon Perivall Pott described the tumor in chimney sweeps [5]. The incidence of squamous cell carcinoma of the scrotum is much lower than that of penile carcinoma, arising in the sixth and seventh decades of life [6]. Penile carcinoma represents less than 0.5% from all male malignancies, most of them being SCCs, verrucous carcinoma being found in 3 to 8% of cases [1]. The incidence of scrotal cancer ranges between 0.9 and 1.8 per 1000000 males/year. The largest histological groups described are the squamous cell carcinomas, basal cell carcinomas and Bowen's disease [7].

We reported the case of a male patient diagnosed with verrucous carcinoma of the scrotum. He presented 4 years following the onset of symptoms. Unfortunately, patients with verrucous carcinoma of the scrotum do not go to seek medical help mostly due to embarrassment, ignorance or both, but also because of the fact that the tumor has a slowly growth and it is painless [8].

The diagnose of verrucous carcinoma was certified by the histological examination after the surgical excision. The tissue fragment sent to the Department of Pathology was a cauliflower-like tumor, sized 110/85/35 mm, which showed an ulceration in the central portion with irregular edges. The tumour was not infiltrative into or adhesive to the testis. The testis had 65/40/20 mm. The microscopic examination revealed exophytic and endophytic proliferation with well-differentiated squamous epithelial cells. Moreover, there were discovered rare koilocytes, suggesting HPV infection.



Histologic features of verrucous carcinoma. Low power view of verrucous carcinoma. Verrucous proliferation of squamous epithelium is evident. The atypia is mild or minimal. Haematoxylin and Eosin (HE), ×2 (up) and HE, ×4 (down)



The presence of the koilocytes. HE, ×10

Regarding the microscopic architectural features, it can be highlighted that the verrucous carcinoma is a well-demarcated exophytic tumor, enlarging progressively over time [3]. This type of squamous cell carcinoma was named *verrucous* due to its exophytic surface with epithelial projections and invaginations filled with keratin, but without noticeable fibrovascular cores [9]. The individual cell cytologic characteristics are relatively benign, with minimal cellular atypia [3].

Taking in consideration all the features of verrucous carcinoma, it is recommended a surgical approach, as it reveals outstanding treatment outcomes. In addition it allows the detection of a possible focal SCC through histologic sampling [10]. We also performed a wide excision of the right hemiscrotum. Recent studies show that lymphadenectomy is not necessary, being associated with a significant risk of morbidity [2]. We did not do the inguinal lymphadenectomy. Morbidity is also due to tissue invasion, being a locally aggressive tumor. The metastases are very rare, so it is considered that the mortality is associated with local aggressiveness of the tumor [4].

Bacterial infection on the tumor surface can be present [11], our patient was diagnosed with *Proteus mirabilis* sensible to ciprofloxacin. Ciprofloxacin is a second generation quinolone and it is used for respiratory, urinary tract, intestinal and abdominal infections caused by different pathogens such as *Escherichia coli*, *Neisseria gonorrhoeae*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, methicillin-susceptible *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Enterococcus faecalis*, and *Streptococcus pyogenes* [12]. The bactericidal action of ciprofloxacin results from inhibition of the enzymes that are responsible for the separation of the bacterial DNA, stopping synthesis of both DNA and proteins [13].

Silver dressings were used to reduce the pain and to accelerate the healing [14] of the wound dehiscence, post-operatively, due to their antibacterial properties [15].

Conclusions

Verrucous carcinoma is an extremely rare tumor and due to its low incidence in scrotal area, a multidisciplinary collaboration would be a more feasible approach. A proper

hygiene and an annually check-up by the general practitioner would improve the detection of new cases.

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