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CASE REPORT

Scrotal Squamous Cell Carcinoma Secondary to Chronic Urinary Irritation: A Case Report with Inguinofemoral and Suprapubic Lymph Node Involvement

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Abstract

A 60-year-old man with a scrotal ulcer was referred to our Cancer Surgery Clinic. Biopsy was positive for squamous cell carcinoma (SCC), which should be considered even in clinically node-negative cases; therefore, the tumor was removed. In addition, adjuvant treatment was not performed. Three months later, the tumor recurred in the scrotum and inguinal regions. Surgical removal and bilateral lymphatic dissection were performed. Treatment was completed with radiotherapy. After one month, the tumor recurred in the suprapubic area, which was removed, and chemotherapy with "methotrexate" was started. After six months, there was no recurrence of the disease. According to other studies as well as our observations, in cases of SCC of the scrotum, sentinel lymph node biopsy should be used in cases with negative nodes, as well as full adjuvant treatments; local surgery is not sufficient.

Key words: Carcinoma, Lymphatic Metastasis, Sentinel Lymph Node Biopsy

Introduction

The scrotum consists of skin, dartos muscle, and the external spermatic, cremaster, and internal spermatic fascia. The dermis of scrotal skin contains hair follicles and apocrine, eccrine, and sebaceous glands. (1) Christer et al. described an association between soot exposure and scrotal cancer in chimney sweepers. The pathogenesis of scrotal squamous cell carcinoma (SCC) involves multiple interacting factors (2):

Risk factors, in general, include occupational exposures, iatrogenic factors, and infectious agents**.** Several occupational exposures have been causally linked to an increased risk of scrotal cancer. Primary preventive measures, including improved hygiene and reduced exposure to carcinogens, have significantly decreased the incidence of scrotal cancer (3).

Recognized risk factors for SCC include:

- Occupations, such as chimney sweeps and tar and paraffin workers. Additionally, occupations with exposure to mineral and cutting oils, such as printing and metalworking, are also at risk, including those in the automotive and aerospace industries, as well as car mechanics, commercial printers, aluminum workers, shale oil workers, pitch workers, engineers, steel production workers, and cavalry personnel.
- Exposure to carcinogenic metals (e.g., arsenic, nickel, and chromium).
- Chronic mechanical irritation.
- Chronic inflammatory states (e.g., chronic lymphedema, chronic urinary irritation, and surgical scars).
- Lifestyle factors (e.g., poor personal hygiene and smoking).
- Viruses (e.g., HPV).
- Exposure to ionizing radiation.

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- Exposure to iatrogenic (e.g., coal, tar, PUVA, radiotherapy, nitrogen mustard, and Fowler's solution).
- Immunosuppressant (e.g., acquired and inherited immunodeficiency and posttransplant immunosuppressant

The primary treatment modality for scrotal carcinoma is surgery, and using of adjuvant treatment for them is under debate (4). In the present study, we have presented a patient who suffered from local and regional recurrence after surgery without receiving proper adjuvant treatment.

Case

In the current work, we investigate a case of scrotal SCC. The patient is a 60-year-old farmer with diabetes and hypertension presented with a 10×15 mm scrotal ulcer. The ulcer developed on chronically inflamed skin due to prolonged urinary exposure from post-prostatectomy incontinence. A biopsy confirmed the SCC lesion. There was no evidence of lymph node involvement on physical examination and ultrasound.

The lesion was excised with a 10-mm margin. The histological evaluation realized moderately differentiated SCC with free margins. The patient's case was discussed in the multidisciplinary team (MDT) meeting to determine the best treatment approach**.**

At the three-month follow-up, the tumor recurred as a vegetative lesion. In addition, he had bilateral palpable inguinal lymph nodes (Figure 1).

Figure 1. Recurrent vegetative lesion of the scrotum and bilateral palpable inguinal lymphadenopathy

A biopsy of the ulcer and a needle biopsy of the inguinal lymph nodes were performed. Histologic evaluations confirmed tumor recurrence and lymph node involvement. An examination by chest, abdomen, and pelvic CT scan was performed to detect probable distant metastasis, which was reported as clear. The patient underwent re-excision with wide margins and bilateral femoroinguinal lymphadenectomy (Figure 2).

Examination of the samples by a pathologist revealed poorly differentiated SCC, whereas the previous evaluation had reported moderately differentiated SCC. The tumor diameter was 6 cm, without peri-neural invasion but with lymphovascular invasion. On the right side, none of the seven removed lymph nodes were involved, but on the left side, 4 out of 10 identified lymph nodes were involved by tumor (5).

The patient underwent adjuvant treatment with scrotal, pelvic, and bilateral inguinal radiotherapy (40Gy); however, one month after the end of radiotherapy (three months after the second operation), he returned with a palpable mass anterior to the pubic bone.

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Figure 2. Surgical specimen from wide local excision and bilateral inguinofemoral lymph node dissection

Again, a needle biopsy was performed from the mass, which confirmed the recurrence of the tumor as an involvement of the lymph nodes in this area. We excised it, and MDT decided to start chemotherapy. Fortunately, after six months, the disease was controlled, and there was no evidence of its recurrence.

Discussion

In rare cases, chronic non-healing ulcers, such as Marjolin-type wounds, have been reported as predisposing lesions for scrotal SCC. The prolonged inflammatory environment in these chronic wounds may contribute to malignant transformation, highlighting the importance of early recognition and appropriate management.

Sentinel lymph node biopsy (SLNB) has emerged as a valuable tool in staging and treatment planning for patients with SCC of the scrotum. As the first lymph node likely to harbor metastatic cells, the sentinel node provides critical prognostic information while minimizing the morbidity associated with extensive lymphadenectomy. The SLNB is particularly advantageous in clinically node-negative patients, allowing for more tailored management.

Nonetheless, the role of SLNB should be interpreted in the context of individual patient risk factors, including tumor depth, differentiation, and lymphovascular invasion. In selected cases, especially when high-risk features are present, adjuvant therapy may be warranted despite negative sentinel node findings. Ongoing studies continue to refine indications for adjuvant treatments, emphasizing the need for a multidisciplinary approach to optimize outcomes.

The SCC is the most common histological type of scrotal cancer. Historically, SCC was the first malignancy to be linked directly to exposure to occupational carcinogens and chronic irritation.
The patient we report here had more than 15 years of chronic irritation of the scrotum by urine. Chronic urinary exposure due to meatal malposition likely contributed to scrotal inflammation and carcinogenesis, as previously reported (6).

Due to the rarity of this disease and limited evidence, adjuvant therapy remains controversial. By all means, if we agree on the inflammatory origin of this SCC, it is entirely defensible to put the SCC of the scrotum in the Marjolin ulcer category and treat this disease as such.

As the previous information has taught us, SCC of the Marjolin ulcer type has a greater tendency to exhibit lymphatic metastasis; therefore, lymphatic evaluation, including physical examination and ultrasound, is mandatory in these cases. On the other hand, in patients with negative nodes, the use of the SLNB method is completely accepted. Accordingly, for our patient, it would have been better to have SLNB at the first operation (7).

One of the important points in evaluating these patients is that the SCC of the scrotum presents as a wound in this area, and maintaining wound hygiene and dressing is not straightforward. Lymphadenopathy may be reactive; thus, needle biopsy should confirm malignancy before inguinal dissection, given its morbidity and lymphedema risk (8). However, it should be noted that due to the high tendency of this tumor to involve the lymph nodes, if the lymph nodes are still palpable after

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antibiotic treatment, in addition to SLNB, these palpable lymph nodes should also be excised and examined by frozen section during surgery (9).

Another important issue that was also observed in our patient is that the route of lymphatic drainage in SCC of the scrotum is not only to the inguinal area, but the suprapubic area should also be considered during evaluation and treatment. It seems reasonable to use adjuvant radiotherapy in combination with chemotherapy (methotrexate, bleomycin, and cisplatin) for four cycles to achieve better disease-free survival (10). Nowadays, neoadjuvant therapy (both chemotherapy and radiotherapy) has also been recommended to downstage a large lesion to achieve complete resection (11).

Conflict of Interest

The authors declare there is no conflict of interest.

References

1. Marietta M, Crane JS. Marjolin ulcer. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025.
2. Yao Zhu, Ding-Wei-Ye. Preneoplastic and primary scrotal cancer updates on pathogenesis and diagnostic evaluation. Urol Clin North Am. 2016; 43(4):523-30.
3. Imrani K, Lahfidi A, Belkouchi L, Jerguigue H, Latib R, Omor Y. Scrotal verrucous carcinoma: An exceptional localization of a rare tumor. Case Rep Med. 2021; 2021:6651925.
4. Debashis Sarkar. A systematic review of scrotal squamous cell carcinoma. EMJ Urol. 2019;7(1):68-74
5. Lam W, Alnajjar HM, La-Touche S, Perry M, Sharma D, Corbishley C, et al. Dynamic sentinel lymph node biopsy in patients with invasive squamous cell carcinoma of the penis: A prospective study of the long-term outcome of 500 inguinal basins assessed at a single institution. Eur Urol. 2013;63(4):657-63
6. Hogstedt C, Jansson C, Hugosson M, Tinnerberg H, Gustavsson P. Cancer incidence in a cohort of Swedish chimney sweeps, 1958-2006. Am J Public Health. 2013;103(9):1708-14.
7. Wu C, Li Z, Guo S, Zhou F, Han H. Development and validation of a nomogram for the prediction of inguinal lymph node metastasis extranodal extension in penile cancer. Front Oncol. 2021; 11:675565.
8. Bazaliński D, Przybek-Mita J, Barańska B, Więch P. Marjolin's ulcer in chronic wounds - review of available literature. Contemp Oncol (Pozn). 2017;21(3):197-202.
9. Essid MA, Bouzouita A, Saadi A, Blel A, Chaker K, Chakroun M, at al. A case report of scrotal squamous cell carcinoma secondary to chronic urinary irritation. Cureus. 2018;10(4):e2430.
10. Žulpaitė G, Žulpaitė R, Vėželis A. Scrotal squamous cell carcinoma: a case report. J Surg Case Rep. 2023; 2023(3):rjad128.
11. Junqueira AL, Wanat KA, Farah RS. Squamous neoplasms arising within tattoos: clinical presentation, histopathology and management. Clin Exp Dermatol. 2017; 42(6):601-6.

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