



Research Article

Penile Metastasis of Colorectal Cancer: Case Report and Discussion on this Rare Clinical Entity

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Abstract

We report a rare case of penile metachronous metastasis of mesorectal adenocarcinoma in an asymptomatic patient, who initially only accepted chemotherapy, but after thirty months underwent total penectomy followed by radiotherapy, due to penile pain caused by ingravescant metastasis. After another cycle of chemotherapy, at five years follow-up from abdominoperineal resection, the patient was free from recurrence. Our case highlights the importance of penile examination during follow-up of many oncologic patients, in order to allow earlier diagnosis with a potential for more conservative penile surgery, also taking into consideration the good response to new oncologic drugs, as in our experience.

Keywords: Penis; Penis Cancer; Colorectal Cancer; Neoplasm Metastasis; Metachronous Neoplasm; Therapy Associated Cancer; Penis Surgeries, Reconstructive.

Introduction

Despite the high frequency of colon carcinoma and the penile complex vascular and lymphatic supply, metastasis to the penis is a rare clinical entity. In particular, since the first case of metastatic penile cancer in 1870, about 500 cases have been reported to date [1,2].

Indeed, this clinical entity is associated with disseminated disease and poor surveillance [3,4]. Regarding the treatment, some options have been proposed, such as partial or total penectomy and radiotherapy with a more palliative than curative effect [5,6]. However, the combination of chemotherapies and the development of new targeted treatments produced in the last years an improvement of progression-free survival as well as the management of side-effects associated with chemotherapy in these

patients [7,8]. These aspects could be taken in consideration when we approach the surgical treatment of metastatic sites, especially such as the penis with a negative influence on patients' sexual activity and psychological well-being.

We report the case of a metachronous penile metastasis from advanced-stage rectal adenocarcinoma and critically discuss its treatment considering our patient's good response to the oncological therapy.

Case Report

A 73-year-old man presented to our attention during a follow-up scheduled after abdominoperineal resection for a mesorectal adenocarcinoma (cT3cN2) with right iliac fossa colostomy in June 2018. Before surgery, neoadjuvant chemotherapy had been administered.

The patient had a history of acute myocardial infarction, reduction of heart ejection fraction and low-risk prostatic cancer in active surveillance.

One year after surgery, in July 2019, a follow-up PET scan showed two small (< 1 cm) hyper-metabolic lesions, the first in the left lung and the second in the left penile corpus cavernosum. The patient was completely asymptomatic with a normal penile shaft and glans at the physical examination. After counseling, he refused any treatment of the penile lesion in order to maintain an active sex life. Thus, considering the small size of the lesion and the patient's preference, we accepted to postpone any treatment after chemotherapy. He underwent folinic acid, fluorouracil, and irinotecan induction treatment followed by a maintenance cycle of folinic acid, fluorouracil, and irinotecan + bevacizumab with a complete regression of both the lung and penile metastasis. During the Covid emergency, the patient was unable to attend follow-up until December 2020, when he reported penile pain for the first time. We performed abdominal and penile shaft MRI and PET scans which showed two solid lesions in both the corpora cavernosa of 27x23mm and 22x17mm, respectively (Figure 1). The case was then discussed during a multi-disciplinary meeting with the indication of a total penectomy with perineal urinary derivation which was performed in February 2021. Pathologic examination confirmed an adenocarcinoma involving both the corpora cavernosa and corpus spongiosum. Both morphologic and immunophenotype analysis (expression of cytokeratin 20 and CDX2) were consistent for metastasis of rectal adenocarcinoma. After the surgical procedure, the patient underwent adjuvant radiotherapy on the remaining corpora cavernosa. The patient recently completed a new induction folinic acid, fluorouracil, and irinotecan chemotherapy cycle followed by periodical PET scans. The last PET scan was performed in December 2022 and was negative for disease recurrence.

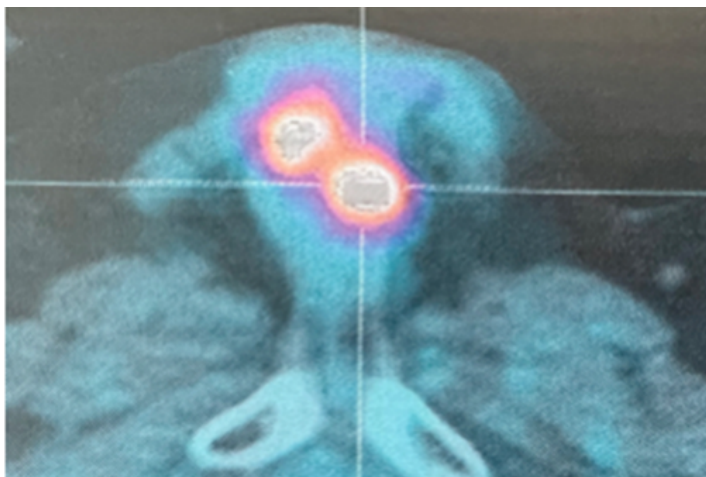


Figure 1: PET scan showing the two solid lesions in both the corpora cavernosa.

Discussion

Colon carcinoma is the third most common cancer worldwide. The most common sites of metastatization are the liver, lungs, central nervous system, and peritoneum [1-4]. The penis is an exceptional site of metastasis. Therefore, there is a discrepancy between the relative blood supply and the rarity of the penis as the site of secondary malignancy. The retrograde venous route is thought to be the main way by which tumor cells from pelvic organs (prostate, urinary bladder, rectosigmoid) reach the corpus cavernosa and the glans, as the dorsal venous system of the penis has communication with the venous plexus system of the pelvis. Similarly, the retrograde lymphatic route seems to be the way by which tumor cells reach the penile skin via lymphatics that drain the pelvic organs, passing through the iliac and inguinal nodes. Less commonly, arterial spread, direct extension, or iatrogenic spread by instruments, could explain metastasis from the lung and liver primaries, sarcomas, or secondary penile root tumors from adjacent pelvic organs. According to the seed/soil hypothesis and to the fact that the site of metastasis is determined not only by the characteristics of the neoplastic cells but also by the microenvironment of the host tissue, the penis probably does not provide the perfect environment (soil) for neoplastic seeding. Furthermore, the rich communications between arterial inflow and venous outflow could explain the difficulty in cell seeding in normal conditions. However, when the outflow is impaired by venous or lymphatic occlusions, such as in the presence of a tumor in the neighboring genito-urinary organs or in massive pelvic disease, the process of seeding could be facilitated. In fact, most metastatic lesions originate from the neighboring genito-urinary and pelvic organs, mainly the bladder, prostate, and rectum-sigmoid. However, many other primary sites have been described, including the kidneys, the hematologic system, the lungs and the testes. To date, the literature reported about 500 cases of penile metastasis, and generally, they are metachronous metastasis with a known history of advanced primary tumors. The most common symptoms are penile nodular masses, malignant priapism, penile pain, difficulties in micturition, and urinary retention. As patients usually present with a known history of primary tumors, any clinical symptoms involving the penis should prompt the search for an eventual penile secondary tumor [5-6].

In the present case, the patient showed metachronous metastasis with a known history of advanced colorectal cancer. However, he came to our attention after a PET scan finding hyper-metabolic lesions but was completely asymptomatic with a normal penile shaft and glans. This aspect should highlight the importance of penile examination during the follow-up schedule of many patients with a history of previous oncologic disease, especially in the case of previous pelvic tumors.

As concerns the management of penile metastasis, there is no well-designed and accepted treatment for these patients. This aspect is likely due to insufficient data in the literature, and the worse prognosis for these patients, who often die within a few months after diagnosis. In particular, the decision between radical or partial penectomy and/or radiation therapy is balanced considering the primary tumor, the size, location, and number of metastatic lesions, the patient's age, performance status, and motivation. Furthermore, as reported in the literature, penectomy does not seem to improve a patient's prognosis [5-10]. In our case, the patient refused any treatment when the penile metastasis was found due to his interest in maintaining an active sex life but we were forced to perform a total penectomy two years later due to the pain caused by two palpable nodular masses which were confirmed by PET scans. However, earlier treatment of the metastasis could have avoided a total penectomy also considering that today, the patient is still alive and free from recurrence, five years from the abdominoperineal resection and two years from the penectomy. This aspect sounds almost surprising considering the reported worse prognosis for these patients, but it is probably due to our patient's good response to the oncological therapy.

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References

1. Dekker E, Tanis PJ, Vleugels JLA, Kasi PM, Wallace MB (2019) Colorectal cancer. *Lancet*. 394: 1467-1480.
2. Baidoun F, Elshiwiy K, Elkeraie Y, Merjaneh Z, Khoudari G, et al (2021) Colorectal Cancer Epidemiology: Recent Trends and Impact on Outcomes. *Curr Drug Targets* 22: 998-1009.
3. Pellegrino SA, Chan S, Simons K, Kinsella R, Gibbs P, et al (2021) Patterns of surveillance for colorectal cancer: Experience from a single large tertiary institution. *Asia Pac J Clin Oncol*. 17: 343-349.
4. Gan S, Wilson K, Hollington P (2007) Surveillance of patients following surgery with curative intent for colorectal cancer. *World J Gastroenterol* 13: 3816-23.
5. Cocci A, Hakenberg OW, Cai T, Nesi G, Livi L, et al (2017) Prognosis of men with penile metastasis and malignant priapism: a systematic review. *Oncotarget* 9: 2923-2930.
6. Mearini L, Colella R, Zucchi A, Nunzi E, Porrozzini C, et al (2012) A review of penile metastasis. *Oncol Rev* 6: e10.
7. Biller LH, Schrag D (2021) Diagnosis and Treatment of Metastatic Colorectal Cancer: A Review. *JAMA* 325: 669-685.
8. Piawah S, Venook AP (2019) Targeted therapy for colorectal cancer metastases: A review of current methods of molecularly targeted therapy and the use of tumor biomarkers in the treatment of metastatic colorectal cancer. *Cancer* 125: 4139-4147.
9. Elferink MAG, De Jong KP, Klaase JM, Siemerink EJ, De Wilt JHW (2015) Metachronous metastases from colorectal cancer: A population-based study in North-East Netherlands. *Int. J. Color. Dis* 30: 205-212.
10. Zhang K, Da J, Yao HJ, Zheng DC, Cai ZK, et al (2015) Metastatic tumors of the penis: a report of 8 cases and review of the literature. *Medicine (Baltimore)* 94: e132.