

Metastasis to the Penis from Rectal Adenocarcinoma

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Abstract. *Penile cancer is a serious but largely under-represented phenomenon in many of the large national cancer databases. Even more rare is the presentation of solitary metastasis to the penis from a gastrointestinal primary site. This case describes one such case of metastasis of rectal adenocarcinoma and details the patient's treatment modalities. Ultimately, although the precise etiology of this particular manifestation is not well understood, the prognosis is poor in the small group that it affects. No individual treatment has been proven superior with regard to long term survival.*

Penile metastases are rare and often originate from the genitourinary system, such as the bladder and the prostate. Out of the known cases of metastasis to the penis, only 18.5% originate from the colon or the rectosigmoid (1). We report an unusual case of a 61-year-old patient with penile metastasis from rectal adenocarcinoma. A review of the literature on penile metastases is summarized.

Case Report

A 60-year-old Caucasian gentleman presented with bleeding per rectum, tenesmus and changes in the caliber of his stool of several months' duration. Rectal examination revealed a mass close to the anal sphincter. Upon colonoscopy, a large, ulcerated, multilobulated mass was discovered less than 1cm beyond the anal verge involving one-third to one-half of the circumference of the anorectal area. Multiple biopsies of the rectal mass were obtained. The specimens were sent for pathological examination and returned with findings of moderately to poorly differentiated adenocarcinoma. The patient then underwent transrectal ultrasound which demonstrated an invasion of the muscularis propria.

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Transrectal ultrasound staging placed him at UT3N1MX. Computerized axial tomographic (CT) scan of the chest showed a calcified granuloma. Other significant radiological findings included bilateral pulmonary nodules measuring from 2-6 mm in size and some interstitial fibrosis without hilar or mediastinal adenopathy. The pulmonary nodules were not deemed definitively metastatic in nature but were certainly of concern. CT of the abdomen revealed multiple lymph node metastases measuring less than 1 cm, the rectal mass, but otherwise no overt metastatic disease.

The patient was started on neoadjuvant chemoradiation therapy. He commenced with a course of 4500 cGy of radiation to the pelvis, followed by an additional dose of 540 cGy to the gross tumor volume (GTV) (rectal tumor), resulting in a total dose of 5040 cGy. The patient also received two 500 mg tablets of Xeloda (capecitabine) twice daily, with daily x-ray therapy (XRT), while having cycles of 5 days on and weekends off for 5 weeks throughout XRT. Following his chemoradiation therapy, the patient had a re-staging CT that showed that he had disease progression to the lungs, demonstrating increased size of pre-existing nodules and the appearance of new lesions. Palliative chemotherapy was initiated with fluorouracil/leucovorin/oxaliplatin (FLOX)/bevacizumab treatments. Approximately 8 months after initiation of chemotherapy, the patient presented to the genitourinary (GU) clinic concerned about a penile lesion. There was a 10-cm exophytic fungating mass on the penile shaft. The mass was hard and non-blanching. The glans of penis was necrotic and the left hemi-glans had an open wound expressing purulent and serous fluid. The decision was made by the urology provider to perform a biopsy on the lesion. When the pathological findings were returned, they demonstrated the unlike finding of moderately differentiated mucinous adenocarcinoma within fibrotic dermis. The risk-to-benefit assessment of treatment options was reviewed with the patient. Ultimately the surgical route was agreed upon and a total penectomy was performed with suprapubic tube placement. The gentleman was then evaluated for palliative radiation therapy (Figure 1). The patient underwent radiation therapy but was overcome by his illness four months later.

Discussion

Every year countless patients present to physicians with urological complaints related to the penis. The disturbing reality is that some of the more commonplace presentations can mask a more serious etiology. An exophytic fungating lesion can be reasonably diagnosed clinically as sexually acquired if a thorough review of the patients' history suggests so (2). Even suspicion of primary penile cancer could distract from the actual culprit of this rare manifestation which carries an even poorer prognosis. Although very seldom seen and poorly understood, this form of secondary penile malignancy is not new to the world of Urology.

The first report of penile metastasis from colorectal cancer was in 1956 (3). Upon further review of the literature, metastasis of rectal adenocarcinoma was described as long ago as 1870 (4). Still, as of 2006 there were fewer than 60 cases of this condition reported (5). Despite decades of reports, the actual progression of this variant condition remains dubious. Metastatic involvement of the penis despite its proximity to the rectum mainly originates from the bladder and prostate. Regional lymph nodes, the liver, lungs and the vertebral column are most likely to be involved in metastasis from rectal cancer (6). The dispute surrounding the natural course of this phenomenon revolves around two main concepts. Some authors propose that perhaps the tumor travels into the corpora by direct extension. However due to the vasculature of the penis, retrograde hematogenous or lymphatic dissemination seem more popular modes of spread. In primary pelvic malignancy, hematogenous dissemination most commonly affects the liver, followed by the lung and less frequently, the bones and the brain. The lymphatic spread of male urogenital pelvic tumors usually occurs *via* one of the four general pathways of lymphatic drainage: the anterior pelvic route along the obliterated umbilical artery to the internal iliac (hypogastric) nodes; the lateral route (characteristic route of spread from prostate adenocarcinomas); the internal iliac (hypogastric) route, and the presacral route (7). One author describes a patient that developed extensive lymph node disease in the abdomen with subsequent lymph node dissection. The distribution of these lymph nodes can perhaps mechanically reroute the abdominal drainage to mimic the configuration of a genitourinary neoplasm. Lymphatic dissemination may also detour when normal drainage has been disrupted by aggressive lymph node dissection. In addition, therapeutic irradiation treatment can also alter the expected pathway of lymphatic flow. After radical cystectomy for bladder cancer, metastatic disease is seen more frequently in the common iliac and para-aortic nodes than in the expected nodal chains. Similarly, after therapeutic irradiation of the prostate or radical prostatectomy, recurrent disease is usually seen in the extrapelvic nodes (8). These mechanisms may explain how



Figure 1. *En bloc* resected penis with mid-shaft neoplasm.

a caudal, retrograde dissemination to the perineum and inguinal region could occur. This in turn may work in tandem with the theory of direct extension.

Malignancy is an uncommon but important differential diagnosis of any penile lesion. The lesions themselves can be painful or painless (9). Concomitantly, a symptomatic patient may report signs and symptoms of perineal pain, induration, urethral obstruction, or hematuria. Up to 40% of patients present with malignant priapism, which is the most common finding (2). For patients presenting with penile lesions and a previous or current history of malignancy, the possibility of metastatic disease should be considered; the threshold for biopsy should be low in this group and clinical suspicion of penile metastatic disease should be confirmed by biopsy. In this case, distinct histology confirmed our finding.

Although this form of metastatic spread is rare its appearance is a harbinger of poor outcome (10). The literature suggests that this presentation will seldom represent a solitary metastatic lesion. In addition, patients that carry this type of cancer is probably suffering from other systemic sequelae of their primary illness. Palliative therapy is paramount in these cases. Other treatment options exist, but the option that was selected for this patient was penectomy. Some authors

advocate this method while others reserve it exclusively for cases of isolated penile metastasis. In primary penile cancer, the choice of partial penectomy is listed as a potential treatment to be considered. Of note, a longstanding concern of penectomy has been the potential psychological consequence. However after brief introspection our patient agreed to this plan of action. Still no method of treatment has been proven to increase survival in these patients.

Conclusion

The majority of the cases described in the available literature cite major lymph node involvement and/or a history of pelvic exposure to radiation therapy. It is feasible to correlate a mechanical redirection of the abdomino-pelvic lymphatic circuit with a propensity toward local infiltration into the penis. Unfortunately, this concept, which melds two of the main hypotheses of spread in this condition, can bring us no closer to predicting its future incidence. Altered drainage may characterize the appearance of penile metastases but not the primary disease itself. However, an increased incidence and the prevalence of this elusive presentation may reflect improvements in the efficacy and availability of antineoplastic treatment modalities. In addition to patients living longer with metastatic disease, and a higher index of suspicion by providers, uncommon patterns of disease spread, such as penile metastasis, are likely to be seen more often.

Disclosures

The Authors have no significant financial relationships with commercial entities to disclose, relative to this case report. There are no conflicts of interest with regards to any of the Authors of this case report.

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