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LETTER TO THE EDITOR

Metastasis to scrotal skin as the initial manifestation in a patient with rectal adenocarcinoma: a rare case report and literature review

Gang Wu1, Bao-Jun Gu2, Kent L Nastiuk3, Jun Gu4, Deng-Long Wu1

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Dear Editor,

We present here a rare case of rectal adenocarcinoma metastasized to scrotum skin that was detected in a 36-year-old man. In addition, we have reviewed the Chinese and English literature for reports of internal malignancy secondary to scrotum skin. To our best knowledge, there are forty cases reported in literature.

Rectal adenocarcinoma mainly metastasizes to the lymph nodes, liver, lung and bone.1 Cutaneous metastasis of rectal carcinoma is rare, which mostly occur in the skin of the abdomen and crissum. Scrotum skin is rarely involved. Cutaneous metastasis is generally an indication of widespread disease.2

A 36-year-old male patient was admitted to our hospital due to the swelling of the scrotum in July 2012. The patient had been undergone with lymphadenectomy due to bubo when he was a child. Some scars could be seen in his bilateral legs (Figure 1a). In March 2010, he had been treated with rectal resection and Colocutaneous colostomy due to colorectal adenocarcinoma in another hospital. The patient complained of dysuria as well as the pain of scrotum and penis more than 1-month prior to the visit. The physical examination revealed the multiple papules in the scrotum with obvious tenderness, and enlargement of the inguinal lymph nodes (Figure 1a). About 2 weeks later, the scrotum papules and plaques began to ulcerate and involved in the penis. Biopsies of the ulcer confirmed metastatic adenocarcinoma that was infiltrating the scrotum skin (Figure 1b). Tumor is immunoreactive for CK7 and CK20 (Figure 1c and 1d). No other distance organs were involved by CT. The patient was subsequently treated with suprapubic urinary diversion and two cycles of chemotherapy consisting of gemcitabine and docetaxel. Then, he refused to accept treatment further and was dead due to liver metastasis after discovering scrotum skin metastasis for 1 year.

Cutaneous metastasis originating from internal malignancies are uncommon.3 The most probable sites of cutaneous metastases are the skin of the anterior chest, followed by the abdomen and back.4 Scrotum skin is unusual invaded. Compared with other histologic subtypes, adenocarcinomas have a higher occurrence to give rise to cutaneous scrotum metastases. The first case of cutaneous scrotum metastasis was reported in 1939. Until now, only 40 such cases had been published in the literature written in Chinese and English (Supplementary Table 1). The mean reported patient age was 55.5 years, range from 2 years old to 84 years old. The most frequent symptom was cutaneous nodules, which happened in 24 patients. Another manifestation included papules, plaques, edema, and ulcer. Skin lesions have been reported in seven patients. Some patients complained of pain associated with ulcer, while others were just painless ulcer or nodules. The gastrointestinal system was the most common organ system metastasized to scrotum skin (17 patients). The urogenital system was the second most frequent sites of cancer origin responsible for cutaneous scrotum metastasis (14 patients), which included prostate, bladder, kidney and urethra. The median interval between diagnosis of the primary tumor and subsequent metastasis to the scrotum was just 6 months (range 1–27 months).

In addition to single case reports, we reviewed larger case series, which contained data regarding cutaneous metastases. In two series of patients performed by Lookingbill et al.3,5 1420 (10.4%) of 4020 patients were found to have skin involvement. However, just one case had metastasized to the scrotum skin. Reingold6 analyzed that 32 of their 2300 patients with carcinoma had cutaneous metastases. However, no case metastasized to the scrotum skin.

The scrotum and penile skin are organs that rarely develop metastases. Maestro et al.6 speculates there are two theories have been postulated to explain this low frequency of metastasis, while their rich vascularization (blood and lymphatic) should result in the opposite. First, perhaps the scrotum and penis have a distinctive defense mechanism, which is not yet discovered (similar to the spleen). Second, these patients with advanced stages of disseminated neoplastic disease pay little attention to the exploration and evaluation of the scrotum and penis, even where a nodule is discovered.

The diagnosis of cutaneous scrotum metastasis is based on clinical suspicion and physical examination, but the best diagnostic method is biopsy or surgical specimen.7 Treatment depends on the location, size, symptomatology and patient’s prognosis and so on, but average survival in these patients is generally short due to metastatic progression. Treatment may consist of local tumor excision, radiation therapy, and radical surgical procedures for cutaneous scrotum metastatic

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1Department of Urology, Tongji Hospital, Tongji University School of Medicine, Shanghai, China; 2Department of Urology, Shanghai 6th People’s Hospital, Shanghai Jiao Tong University, Shanghai, China; 3Department of Pathology and Laboratory Medicine, University of Rochester, Rochester, New York, USA; 4Department of Pathology, Tongji Hospital, Tongji University School of Medicine, Shanghai, China. Correspondence: Dr. DL Wu (wu.denglong2013@126.com)

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tumors. With the development of the chemotherapeutic drugs, such as vinorelbine, gemcitabine, paclitaxel and docetaxel, some researchers began to use chemotherapy, but the effect has not been identified as definitive recommendations due to lack of a sufficient number of cases to identify.\(^7-9\)

While cutaneous metastasis tends to show a poor prognosis. In literature, the average time from diagnosis of cutaneous scrotum metastases to death is ranging from 1 to 27 months. Because metastasis to scrotum skin, in most cases, tends to be part of the widely disseminated disease.

In conclusion, any new skin lesions should be suspected as metastatic in a patient with a prior history of malignant carcinoma. Although treatment of cutaneous scrotum metastasis is almost always palliative, early recognition may be required for improving survival rate.

**AUTHOR CONTRIBUTIONS**
WG participated in the design of the study, drafted the manuscript and performed the literature review. GBJ have made substantial contributions to draft the manuscript and perform the literature review. NEL have been involved in drafting the manuscript or revising it critically for important intellectual content; GJ have made substantial contributions to acquisition of figure, and interpretation of data; WDL have given final approval of the version to be published. All authors read and approved the final manuscript.

**COMPETING FINANCIAL INTERESTS**
The authors declare no competing financial interests.

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Supplementary information is linked to the online version of the paper on the *Asian Journal of Andrology* website.

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**Supplementary Table 1a: Reports of scrotal metastasis**

| Report | Age (years) | Primary origin | Pathological type | Therapy | Symptoms | Survival (months) |
|--------|-------------|----------------|-------------------|---------|----------|------------------|
| 1      | 55          | Kidney         | RCC               | None    | Ulcerated nodule | 1                |
| 2      | 50          | Kidney         | RCC               | None    | Nodule   | NF               |
| 3      | 83          | Prostate       | Adenocarcinoma    | NF      | Nodule   | NF               |
| 4      | 54          | Prostate       | Adenocarcinoma    | Chemotherapy | Nodules | 6                |
| 5      | 70          | Lung           | SCC               | None    | Nodule   | 6                |
| 6      | 73          | Prostate       | Adenocarcinoma    | None    | Ulcerated nodule | 1                |
| 7      | 21          | Stomach        | Signet ring cell carcinoma | Chemotherapy | Hemorrhagic ulceration | 6.5              |
| 8      | 72          | Prostate       | Adenocarcinoma    | NF      | Painless nodule | 4                |
| 9      | 60          | Colorectum     | Adenocarcinoma    | NF      | Nodule   | NF               |
| 10     | 70          | Prostate       | Adenocarcinoma    | Surgery | Scrotal edema | >24              |
| 11     | 67          | Stomach        | Adenocarcinoma    | Surgery | Nodule   | NF               |
| 12     | NF          | Colorectum     | Adenocarcinoma    | NF      | Nodule   | NF               |
| 13*    | 62          | Ileum          | Leiomyosarcoma    | Surgery + chemotherapy | Mass | 2                |
| 14     | NF          | Lung           | Adenocarcinoma    | NF      | NF       | NF               |
| 15     | 77          | Lung           | Adenocarcinoma    | None    | Tender   | 1                |
| 16     | 79          | Bladder        | TCC               | Chemotherapy | Tender | >15              |
| 17     | 30          | Colorectum     | Adenocarcinoma    | Chemotherapy | Tender/ulcers | NF               |
| 18     | 59          | Stomach        | Adenocarcinoma    | Unknown | Mass     | Unknown          |
| 19     | 66          | Colorectum     | Adenocarcinoma    | Unknown | Mass     | Unknown          |
| 20     | 84          | Urethra        | TCC               | Chemotherapy | NF     | 1                |
| 21     | 50          | Colorectum     | Adenocarcinoma    | NF      | None     | 7                |
| 22     | 33          | Lymphaden      | Large cell lymphoma | None   | Ulcerative nodule | Unknown          |
| 23     | 14          | Retropertioneum | Malignant mesenchymoma | Surgery | Mass/nodule | 6                |
| 24     | 2           | Retropertioneum | Ganglio-neuroblastoma | Surgery | Mass     | 8                |
| 25     | 60          | Kidney         | RCC               | Surgery | Mass     | 17               |
| 26     | 69          | Colorectum     | Adenocarcinoma    | NF      | Plaque/nodule | 6                |
| 27     | 56          | Prostate       | Adenocarcinoma    | NF      | Edema/plaque | NF               |
| 28     | 60          | Prostate       | Small cell carcinoma | None   | Papule   | 1                |
| 29     | 53          | Stomach        | Adenocarcinoma    | Unknown | Mass/edema | Unknown          |
| 30     | 65          | Prostate       | Adenocarcinoma    | None    | Papule   | 2                |
| 31     | 45          | Bladder        | TCC               | NF      | Verrucous papule/nodule | NF               |
| 32     | 72          | Colorectal     | Adenocarcinoma    | NF      | Painless ulcer | NF               |
| 33     | 52          | Lung           | Mucoepidermoid carcinoma | Chemotherapy | Abscess | 1.5              |
| 34     | 47          | Thyroid        | Hurthle cell carcinoma | NF      | Ulcerated nodule/edema | <12              |
| 35     | 5           | Kidney         | Wilms tumor       | Surgery + chemotherapy | Nontender scrotal mass | >11              |
| 36     | 79          | Colorectum     | Adenocarcinoma    | Palliative | Papule/nodule | 6                |
| 37     | 41          | Omentum        | NHL               | Unknown | Edema     | Unknown          |
| 38     | 75          | Stomach        | Adenocarcinoma    | Unknown | Nodules/priapism | 3                |
| 39     | 63          | Colorectum     | Myxoedema         | Surgery + chemotherapy | Nodule/edema | >27              |
| 40     | 36          | Colorectum     | Adenocarcinoma    | Palliative | Ulcerated nodule/edema | 16              |

NF: not been found; NHL: non-Hodgkin lymphoma; SCC: squamous cell carcinoma; RCC: renal cell carcinoma; TCC: transitional cell carcinoma
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*Report in Chinese language