Port Site Metastasis after Surgery for Renal Cell Carcinoma: Harbinger of Future Metastasis

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Abbreviations and Acronyms

PSM = port site metastasis

RCC = renal cell carcinoma

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For other articles on related topics see pages 559 and 567.

Editor's Note: This article is the third of 5 published in this issue for which category 1 CME credits can be earned. Instructions for obtaining credits are given with the questions on pages 622 and 623.

Purpose: Port site metastasis is a rare occurrence after minimally invasive treatment for renal cell carcinoma. However, its prognostic implications are unclear because reports in the literature are heterogeneous in detail and followup. We clarify the significance of port site metastasis in cancer specific survival and broaden our understanding of this phenomenon.

Materials and Methods: A MEDLINE® search for published studies of renal cell carcinoma port site metastasis was performed. Contributing factors to port site metastasis, stage, Fuhrman grade, pathology, port site metastasis treatment method, followup protocol and long-term outcomes were collected. The corresponding authors of each publication were contacted to fill in details and provide long-term outcomes. We added 1 case from our recent experience.

Results: A total of 16 cases from 12 authors (including ourselves) were found. Of the 12 authors 8 were available for correspondence and 9 cases were updated. Eventual outcomes were available for 11 of the 16 cases and survival curves showed poor prognosis with a 31.8% overall 1-year survival rate. Of the 16 cases 12 were radical nephrectomy and 4 were partial nephrectomy, and 13 involved multiple metastases in addition to the port site metastasis. Nine of the cases had no identifiable technical reason for port site metastasis formation such as specimen morcellation, absence of entrapment or tumor rupture. These tumors were uniformly aggressive, Fuhrman grade 3 or higher.

Conclusions: Port site metastasis after minimally invasive surgery for renal cell carcinoma is a rare occurrence with a poor prognosis. In most cases port site metastasis is not an isolated metastasis but instead is a harbinger of progressive disease. While technical factors can have a role in port site metastasis formation, it appears that biological factors like high tumor grade also contribute.

Key Words: neoplasm metastasis; carcinoma, renal cell; laparoscopy; recurrence

MINIMALLY invasive treatment of malignancy has become increasingly common. Laparoscopy is associated with decreased hospitalization times, faster recovery, decreased pain and improved cosmesis. Port site metastasis is a rare and troubling occurrence in patients after minimally invasive surgical treatment of renal cell carcinoma.

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In 1978 Dobronte et al first described PSM after diagnostic laparoscopy for ovarian cancer. Since then, PSM has been documented in a range of cancers, including malignancies of the colon, gallbladder, adrenals and urothelium. Certain cancers have a known predilection for PSM. Cancers of the gallbladder have a PSM incidence as high as 14% to 30% and are associated with high rates of peritoneal carcinomatosis.[1] However, PSM in gynecologic and colorectal cancers is less common, with rates as high as 4% and 5%, respectively.[2,3] In 1994 Stolla et al were the first to report PSM after treatment of urological malignancy when they described a case of subcutaneous PSM of transitional cell carcinoma.[4] Subsequently more than 50 cases of urological PSM have been reported.[5] However, PSM of renal cell carcinoma remains poorly understood, in part due to the rarity with which it is reported.

To date, only 16 cases of RCC PSM have been published. Among these accounts, information regarding PSM treatment and eventual patient outcome is heterogeneous. To better understand the prognostic implications of a PSM we contacted the authors of all published reports of RCC PSM and compiled details regarding these cases.

METHODS

An electronic search of the MEDLINE database for all published literature regarding RCC PSM through the year 2013 was performed. "Port site metastasis" and "renal" were entered as keywords for the search, and the 55 results matching these terms were reviewed. Publications which reported a case of RCC PSM were included, and those that represented a duplicate reference to previously published RCC PSM cases were excluded from the study. Overall 13 publications from 12 authors were identified, resulting in 16 cases of PSM after laparoscopic or robotic surgery for RCC. Information regarding the index procedure, tumor stage and pathology, and PSM presentation was compiled. The corresponding authors for these publications were contacted for additional details regarding PSM treatment approach, followup protocol and eventual patient outcome. In cases for which initial contact could not be made, at least 5 attempts during a 2-month period were made to reach the corresponding author.

RESULTS

Details of the 16 cases of RCC PSM are summarized in the supplementary table (http://jurology.com/). Of the 12 authors 8 were available for correspondence and their cases were updated. PSM occurred after laparoscopic radical nephrectomy (12), laparoscopic partial nephrectomy (3) and robot-assisted partial nephrectomy (1). Seven cases had identifiable causes for PSM, including specimen morcellation (3), lack of entrapment during tumor extraction (2) and tumor rupture (2). Nine cases identified no technical impetus for PSM formation. Index tumor pathology included clear cell (11), papillary (4) and chromophobe RCC (1). Mean time to PSM presentation was 16 months (range 3 to 39, median 11). Initial PSM presentation varied, including isolated port site metastasis (6), multiple port sites (3) and widespread disease (7). Of the 9 patients who presented with isolated PSM more widespread disease eventually developed in 6. One patient presenting with widespread metastases died of pulmonary embolism before PSM treatment could be initiated. Otherwise, surgical resection of the PSM was the primary treatment modality in 56% of cases (9 of 16), comprised of 1 laparoscopic and 8 open approaches.

Among the 9 patients who presented with only PSM and no other metastatic disease, 7 underwent surgical tumor excision. Of the 2 patients who did not undergo this treatment 1 with an isolated PSM received radiation, and another with multiple port site metastases received chemotherapy and radiation. Among the 7 patients who presented with widespread disease surgical resection was less common, with 2 undergoing surgical resection of PSM and other metastases. Of the 5 patients who did not undergo surgical resection 1 received sunitinib plus radiation, another died before treatment could be initiated and 3 did not have primary treatment information available. The primary author of these 3 cases did not respond to our requests for updated information.

Mean followup was 29 months after PSM treatment (median 12, range 0.5 to 86) after updated author responses. Survival outcome was unavailable for 5 cases for which survival was not reported in the original manuscript or followup correspondence. However, 4 of these patients presented with widely metastatic disease at PSM diagnosis. Of the 11 other cases with survival data available the overall 1-year probability of survival after PSM treatment was 31.8% (see figure).

The cancer specific probability of survival after PSM treatment was 35% at 1 year (see figure). Five patients with metastasis did not die of their disease, whereas 1 patient with widespread metastasis died of pulmonary embolism 17 days after PSM treatment. Another patient with stable lung metastases died of congestive heart failure 86 months after PSM treatment. Three patients with metastatic disease were still alive at 10, 12 and 72 months, respectively.

DISCUSSION

The number of reports concerning PSM and the true incidence of PSM are not known. Large series on