Delayed Multiple Port Sites Metastases After Laparoscopic Radical Prostatectomy

Brusabhanu Nayak, MS, MCH, Prem Nath Dogra, MS, MCH, Vaibhav Saxena, MS, MCH, Ashis Saini, MS, MCH

Department of Urology, All India Institute of Medical Sciences, New Delhi, India (all authors).

ABSTRACT

Introduction: Laparoscopic port site metastases are recurrent nodular lesions developing locally in the abdominal wall within the scar tissue of one or more trocar sites. We are reporting an extremely rare case of delayed multiple port site metastases 3 years after laparoscopic radical prostatectomy. In this case, 3 port site metastases appeared 3 years after laparoscopic radical prostatectomy.

Case Description: A 65-year-old man was evaluated for lower urinary tract symptoms and found to have raised serum prostate-specific antigen of 9.06 ng/mL. Transrectal ultrasonography-guided biopsy of the prostate revealed an adenocarcinoma of the prostate (Gleason score 3 + 4 = 7), with 5 of 12 cores positive for tumor. Contrast-enhanced computed tomography showed localized disease with no involvement of seminal vesicle or lymph nodes. The bone scan was normal. He underwent laparoscopic radical prostatectomy for localized carcinoma of the prostate. He developed 3 port site metastases 3 years after surgery. In view of multiple port site metastatic disease, bilateral orchiectomy was done. The patient is doing well after 1 year of follow-up.

Conclusion: We report an occurrence of delayed multiple port site metastases after laparoscopic radical prostatectomy. The 3 sites of metastases in our case included the extraction site, the most active instrument site, and the drain placement site.

Key Words: Laparoscopy, Metastases, Multiple, Port sites, Radical prostatectomy.

Citation Nayak B, Dogra PN, Saxena V, Saini A. Delayed multiple port sites metastases after laparoscopic radical prostatectomy. CRSLS e2014.00229. DOI: 10.4293/CRSLS.2014.00229.

Address correspondence to: Brusabhanu Nayak, MS, MCH, Department of Urology, All India Institute of Medical Sciences, New Delhi, 110029, India. Phone: +919814465239, E-mail: brusabhanu@gmail.com

INTRODUCTION

Laparoscopic port site metastases are nodular lesions developing locally in the abdominal wall within the scar tissue of one or more trocar sites. Port site metastases are not associated with diffuse peritoneal carcinomatosis.[1] The first reported case of a port site metastasis after urologic oncology was reported in 1994 after a lymphadenectomy for transitional cell carcinoma.[2] In different studies, 13 cases of laparoscopic port site recurrence have been published after uro-oncologic surgery. These include the following: 3 cases of transitional cell carcinoma of the upper tract;[3–5] 3 cases of lower tract transitional cell carcinoma occurring after pelvic lymph node dissection for pT3 transitional cell carcinoma;[6,7] 2 cases of renal cell carcinoma;[8,9] 2 cases of non-small cell carcinoma of the lung identified during laparoscopic adrenalectomy;[10,11] 1 case of prostate cancer after pelvic lymph node biopsy;[12] and 1 case of nonseminomatous germ cell tumor after postchemotherapy retroperitoneal lymph node dissection.[10] Only 2 cases of port site metastases after transperitoneal laparoscopic radical prostatectomy have been reported until now.[13,14] We are reporting an extremely rare case of delayed multiple port site metastases 3 years after laparoscopic radical prostatectomy. In this case, 3 port site metastases appeared 3 years after laparoscopic radical prostatectomy.

CASE REPORT

A 65-year-old man was evaluated for lower urinary tract symptoms and found to have raised serum prostate-spe-

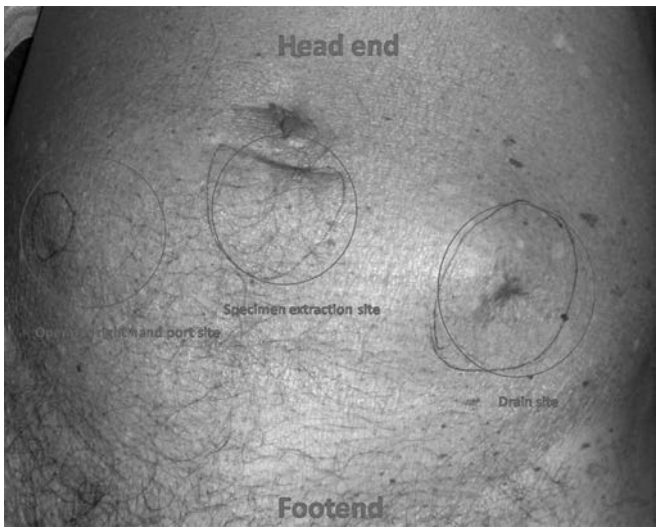

Figure 1. Front view of the abdomen.

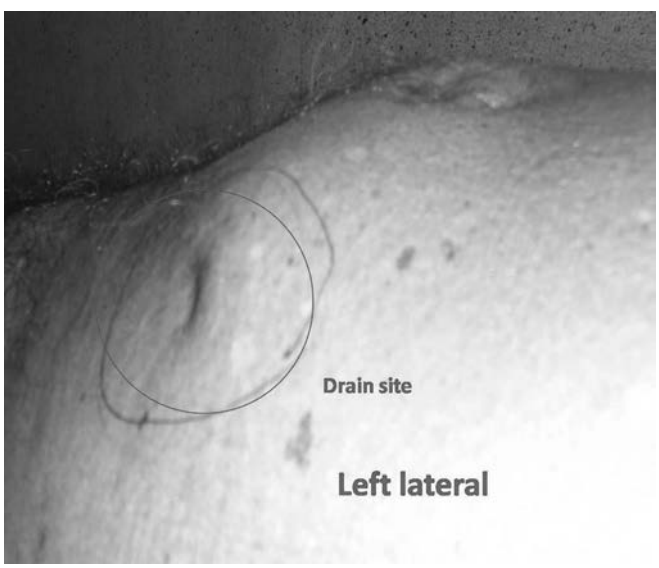

Figure 2. Left lateral view of the abdomen.

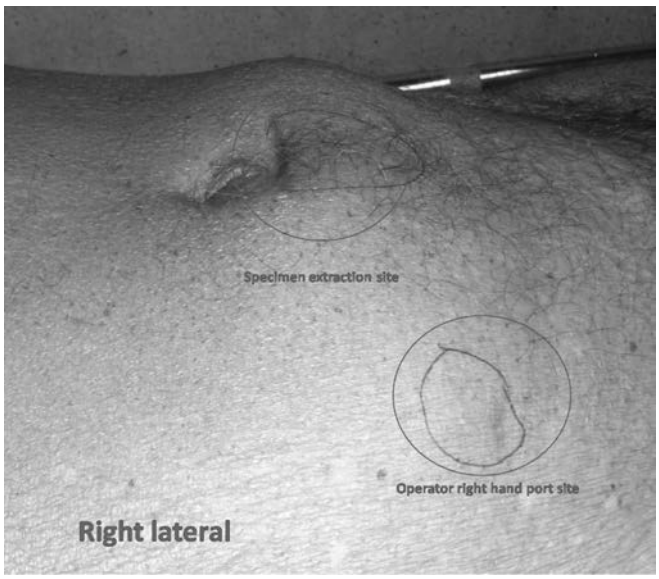

Figure 3. Right lateral view of the abdomen.

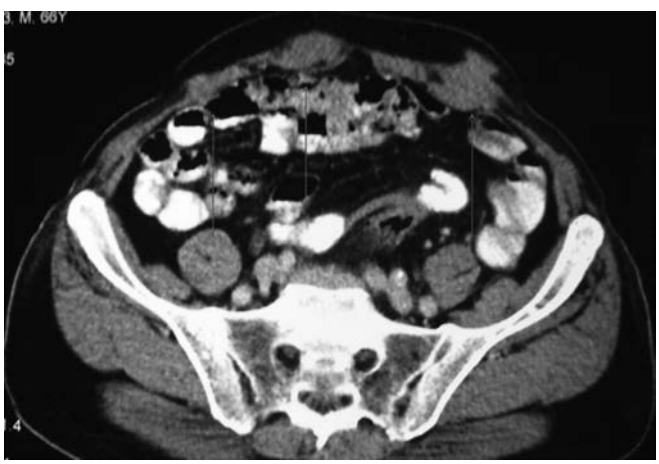

Figure 4. Computed tomography scan of the patient showing recurrence at 3 port sites.

cific antigen (PSA) of 9.06 ng/mL. Digital rectal examination revealed non-nodular grade 2 prostate. Transrectal ultrasonography-guided biopsy of the prostate revealed an adenocarcinoma of the prostate (Gleason score 3 + 4 = 7), with 5 of 12 cores positive for tumor (left and right parasagittal mid and apex and left mid axial cores). Contrast-enhanced computed tomography showed localized disease with no involvement of seminal vesicle or lymph nodes (T2 N0 M0). The bone scan was normal. Clinical staging of the tumor was CT1 NX MX. He underwent laparoscopic radical prostatectomy for localized carcinoma of the prostate. Lymphadenectomy was not done in view of the clinically localized carcinoma of the prostate with serum PSA <10 ng/mL. An Endocatch bag (Covidien, Mansfield, Massachusetts) was used for specimen retrieval. The preoperative and postoperative periods were uneventful. Histopathology report of the specimen was adenocarcinoma of the prostate (Gleason score 4 + 4 = 8) with perineural invasion and no capsular breach with all margins free of tumor (pT2 NX MX). There was no lymphovascular invasion. The PSA nadir reached <0.02 ng/mL after 3 months and remained undetectable up to 3 years. The patient remained asymptomatic for 3 years. Then, PSA began to rise, and it was 0.66 ng/mL at 3.5 years and climbed to 10.5 ng/mL after another 6 weeks. Abdominal examination re-

vealed well-healed incisions with nontender hard nodules over 3 port sites (size ~2 × 2 cm) (**Figures 1–3**). Computed tomography scan (**Figure 4**) confirmed the abdominal wall nodules. Digital rectal examination revealed no abnormality and the bone scan was normal. Multiple core biopsies from all port site nodules revealed adenocarcinoma of the prostate with positive PSA staining (**Figure 5**). In view of multiple port site metastatic disease, bilateral orchiectomy was done. Three months after orchiectomy, the size of port site nodules decreased significantly. The patient's PSA reached 1.8 ng/mL after 6 months of follow-up. After 18 months of follow-up, the abdominal nodules had decreased to <10 mm clinically and his serum PSA was undetectable.

DISCUSSION

In recent years, laparoscopic surgery has commonly been used for the treatment of urologic cancer. Concerns about the oncologic adequacy of laparoscopy were raised after port site metastases were observed. The exact cause for tumor implant at a port site after laparoscopic radical prostatectomy has not been clearly identified, although several hypotheses have been put forward. There are different factors responsible for port site metastases. It can be due to biologic property of the tumor itself or poor surgical technique. For successful metastasis to occur, tumor cells, after being detached from the primary lesion, readhere to other tissue and replicate. Inadvertent sectioning through the tumor, trauma from grasping instruments, or tumor contamination of closure devices can cause tumor cell spillage.[15] Implantation of tumor cells is higher in recently traumatized tissues or areas of high cellular proliferation. Laparoscopic port sites and peritoneal incisions have rapid cellular turnover; hence, they provide fertile ground for implantation of tumor cells. Very large incisions or trocars that are inserted in a nonorthogonal fashion might allow turbulent air flow around the trocars, thereby assisting the implantation of exfoliated tumor cells during laparoscopic dissection and manipulation.[16] Theoretically, increased mechanical trauma during specimen retrieval through a small incision can increase the chance of tumor implantation.[17] Impermeable specimen bags serve as an interface between the tumor specimens and wound to minimize potential contamination. Combination of these factors may be responsible for port site metastasis after laparoscopic radical prostatectomy. Risk of port site metastases in urologic surgery is reported to be less than that in other types of oncologic surgery. This has been thought to be secondary to the less aggressive nature of renal and prostate tumors, which constitute most cases of urologic oncology.[18] In the present case, the patient developed delayed multiple port site metastases with a PSA of 10.5 ng/mL, likely representing poorly differentiated prostate cancer. In a retrospective, single-case report, the exact cause of recurrence cannot be determined. Several methods have been suggested by Tsivian and Sidi[19] to reduce the port site metastasis, including the following: taking proper technical preparation; avoiding laparoscopic surgery in the presence of ascites; avoiding gas leakage along the trocar by proper trocar fixation; avoiding tumor boundary violation; taking adequate precautions during morcellation, such as using an impermeable bag; using an entrapment bag for intact specimen removal; using povidone-iodine solution to irrigate the laparoscopic instruments and the trocar and port site wounds; and suturing of 10-mm trocar wounds. Recently there has been a significant decrease in incidence of port site metastases. Several intraperitoneal agents such as methotrexate, povidone-iodine, sodium hypochlorite, and aspirin have been used to eradicate tumor cells.

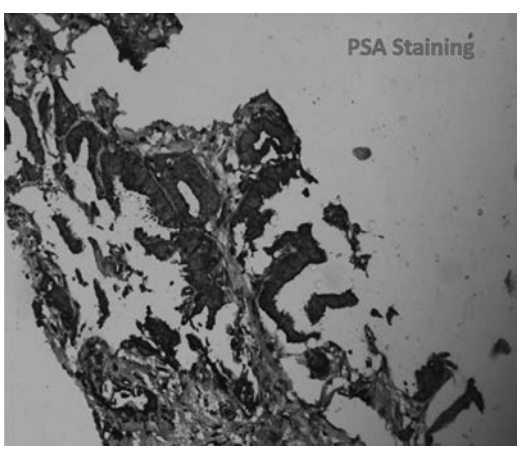

Figure 5. Prostate-specific antigen staining of the port site biopsy slide was positive.

CONCLUSION

We report an occurrence of delayed multiple port site metastases after laparoscopic radical prostatectomy. Although the incidence remains extremely low, it is possible that highly aggressive, dedifferentiated tumors might be at greater risk. The 3 sites of recurrence in our case included the extraction site, the most active instrument site, and the drain placement site. Continued surveillance will likely provide additional information in the future.

References:

1. Reymond MA, Schneider C, Kastl S, Hohenberger W, Köckerling F. The pathogenesis of port-site recurrences. *J Gastrointest Surg.* 1998;2(5):406–414.

2. Stolla V, Rossi D, Bladou F, Rattier C, Ayuso D, Serment G. Subcutaneous metastases after coelioscopic lymphadenectomy for vesical urothelial carcinoma. *Eur Urol.* 1994;26(4): 342–343.

3. Otani M, Irie S, Tsuji Y. Port site metastasis after laparoscopic nephrectomy: unsuspected transitional cell carcinoma within a tuberculous atrophic kidney. *J Urol.* 1999;162(2):486–487.

4. Ahmed I, Shaikh NA, Kapadia CR. Track recurrence of renal pelvic transitional cell carcinoma after laparoscopic nephrectomy. *Br J Urol.* 1998;81(2):319.

5. Ong AM, Bhayani SB, Pavlovich CP. Trocar site recurrence after laparoscopic nephroureterectomy. *J Urol.* 2003;170:1301.

6. Goldstein DS, Lu ML, Hattori T, Ratliff TL, Loughlin KR, Kavoussi LR. Inhibition of peritoneal tumor-cell implantation: model for laparoscopic cancer surgery. *J Endourol.* 1993;7(3): 237–241.

7. Altieri V, D'Armiento M, DeSio M, et al. Can laparoscopic lymphadenectomy disseminate bladder cancer? *Acta Urol Ital.* 1998;12:231–234.

8. Fentie DD, Barrett PH, Taranger LA. Metastatic renal cell cancer after laparoscopic radical nephrectomy: long-term follow-up. *J Endourol.* 2000;14(5):407–411.

9. Castilho LN, Fugita OE, Mitre AI, Arap S. Port site tumor recurrences of renal cell carcinoma after videolaparoscopic radical nephrectomy. *J Urol.* 2001;165(2):519.

10. Rassweiler J, Tsivian A, Kumar AV, et al. Oncological safety of laparoscopic surgery for urological malignancy: experience with more than 1,000 operations. *J Urol.* 2003;169(6): 2072–2075.

11. Chen B, Zhou M, Cappelli MC, Wolf JS, Jr. Port site, retroperitoneal and intra-abdominal recurrence after laparoscopic adrenalectomy for apparently isolated metastasis. *J Urol.* 2002; 168(6):2528–2529.

12. Bangma CH, Kirkels WJ, Chadha S, Schröder FH. Cutaneous metastasis following laparoscopic pelvic lymphadenectomy for prostatic carcinoma. *J Urol.* 1995;153(5):1635–1636.

13. Savage SJ, Wingo MS, Hooper HB, Smith MT, Keane TE. Pathologically confirmed port site metastasis after laparoscopic radical prostatectomy: case report and literature review. *Urology.* 2007;70(6):1222.e9–11.

14. Larrousse C, Brasseur P, Sukkarieh F. Port-site metastasis following laparoscopic radical prostatectomy for mucinous adenocarcinoma of the prostate [in French]. *J Radiol.* 2005;86(3): 337–9.

15. Allardyce RA, Morreau P, Bagshaw PF. Operative factors affecting tumor cell distribution following laparoscopic colectomy in a porcine model. *Dis Colon Rectum.* 1997;40:939–945.

16. Champault G, Taffinder N, Ziol M, Riskalla H, Catheline JM. Cells are present in the smoke created during laparoscopic surgery. *Br J Surg.* 1997;84(7):993–995.

17. Tseng LN, Berends FJ, Wittich P, et al. Port-site metastases: impact of local tissue trauma and gas leakage. *Surg Endosc.* 1998;12(12):1377–1380.

18. Elbahnasy AM, Hoenig DM, Shalhav A, McDougall EM, Clayman RV. Laparoscopic staging of bladder tumor: concerns about port site metastases. *J Endourol.* 1998;12(1):55–59.

19. Tsivian A, Sidi AA. Port site metastases in urological laparoscopic surgery. *J Urol.* 2003;169(4):1213–1218.