Renal cell carcinoma metastasis at laparoscopic port site

Arroyo-López Rafael,1 Aragón-Tovar Anel,1 López-Verdugo José,1 Navarrete-García Enrique1, Castillo-Chavira G.1

ABSTRACT

Oncological safety in laparoscopic procedures for malignant tumors has been widely questioned. Port sites have been the main concern due to tumor seeding and consequent metastases, limiting the use of laparoscopy in malignant tumor treatment.

The patient is an 80-year-old woman with a history of 12-year progression of diabetes mellitus treated with glibenclamida. Patient had left radical nephrectomy by hand-assisted laparoscopy, T2NOMO, and histopathological result of Fuhrman nuclear grade 4 clear cell carcinoma. Her present complaints began with an increase of volume at supraumbilical wound level and leftiliac fossa, accompanied by asthenia, adynamia and hyporexia. Biopsy of lesion resulted in histopathological report of clear cell carcinoma metastasis.

Factors that have been related to tumor seeding and port-site metastasis can be divided into 3 categories: tumor-related, wound-related and surgical technique-related.

Conclusions: Port-site metastasis in urological laparoscopic surgery is very rare. Multiple factors have been associated with tumor seeding, but tumor grade and stage appear to play a major role.

RESUMEN

La seguridad oncológica de los procedimientos laparoscópicos de tumores malignos ha sido ampliamente cuestionada. El principal motivo de preocupación es el sitio de los puertos laparoscópicos debido a la siembra tumoral y consecuentes metástasis, situación que ha limitado el uso de la laparoscopia en el tratamiento de las neoplasias malignas.

Paciente femenina de 80 años de edad, con antecedentes de diabetes mellitus de 12 años de evolución en tratamiento con glibenclamida. Nefrectomía radical izquierda por laparoscopia mano asistida T2NOMO, con resultado histopatológico de carcinoma de células claras con grado nuclear Fuhrman 4. Inició su padecimiento actual con aumento de volumen a nivel de la herida supraumbilical y de la fosa ilíaca izquierda; acompañado de astenia, adinamia e hiporexia. Se realizó biopsia de dicha lesión y el resultado histopatológico fue metástasis de carcinoma de células claras.

Los factores que se han relacionado con la siembra del tumor y las metástasis en el sitio del puerto laparoscópico, se pueden dividir en tres categorías: relacionados con el tumor, relacionados con la herida y con la técnica quirúrgica.
CONCLUSIONES: Las metástasis en el sitio de los puertos en cirugía urológica laparoscópica, son muy raras. Múltiples factores han sido vinculados a la siembra del tumor, sin embargo, el grado tumoral y el estadio parecen ser preponderantes.

Palabras clave: Metástasis, carcinoma renal, metástasis en el sitio de puertos de laparoscopia, recurrencia laparoscópica, México.

OBJECTIVE

A clinical case of renal cell carcinoma metastasis at laparoscopic port site is presented.

CLINICAL CASE

The patient is an 80-year-old woman with a 12-year history of diabetes mellitus treated with glibenclamide. She is a non-smoker, non-drinker and does not have high blood pressure. In December 2008 patient underwent hand-assisted laparoscopic left radical nephrectomy with a histopathological result of Fuhrman grade 4 clear cell carcinoma, 8 x 6 x 5.5 cm tumor and elements of neoplasia-free renal hilum.

Present illness: In June 2008 patient presented with volume increase at supraumbilical wound level in the left iliac fossa accompanied with asthenia, adynamia and hyporexia.

Physical examination: Abdominal palpation revealed a mass of approximately 6 x 5 cm in the periumbilical region and another 3 cm mass in the left iliac fossa. Both masses were hard, mobile, non-painful, with no changes of skin color, no increase in temperature and no fluctuations.

Laboratory work-up: Leukocytes 6,160 mm$^3$; hemoglobin 10.3 g; glycemia 117 mg/ml; serum creatinine 1.0 mg/ml and normal liver function tests.

Computed tomography revealed heterogeneous, solid, abdominopelvic tumor in the left lateral and anterior abdominal wall (Images 1 and 2).

Histopathological results of biopsy were clear cell carcinoma metastasis.

DISCUSSION

Rassweiler and collaborators found a 0.18% incidence of metastasis in 1,098 patients who had undergone urological laparoscopic procedures between 1992 and 2002 due to malignant tumors. An attempt has been made to explain metastasis development at laparoscopic port site with various theories. However, no one laparoscopic surgery can explain tumor seeding. Various factors that appear to facilitate tumor seeding in laparoscopic surgery have been described.$^{1,2}$

Factors related to tumor seeding and port site metastasis can be divided into three categories: tumor-related, wound-related and surgical technique-related.

Tumor-related factors: Biological aggressiveness of the tumor, represented by grade and stage, could play a decisive role in possible tumor seeding determination, explaining why grade 2 and 3 transitional cell carcinomas represent the majority of port site metastases in urological procedures.

Wound-related factors: Local and systemic immune response to the pneumoperitoneum has been suggested. Its physiopathological mechanism has yet to be completely defined. There is a tendency towards systemic preservation of the immune system and towards immune depression of the peritoneum during laparoscopic insufflation demonstrated by macrophage function alteration.

Surgical technique-related factors: Manipulation is the principal factor acting in tumor dissemination. Extraction of the surgical specimen is determined by the surgeon. However, it is logical to assume that morcellation of the specimen increases tumor seeding. The direct dissemination of tumor cells from contaminated material or from extraction with an unclosed bag is well-documented. The observance of a large number of tumor cells at excessively manipulated ports supports this hypothesis as well as observance of greater number of malignant cells at port sites used by the surgeon compared with those used by assistants.$^{3-5}$
For the purpose of preventing port contamination, the use of intraperitoneal injection of chemical agents such as methotrexate, iodine, indomethacin, sodium hypochlorite and acetylsalicylic acid has been promoted. However, their efficacy has not been proven and the risk of peritoneal irritation is increased.

Recently, heparin as an anti-adhesion agent has been suggested. Low molecular weight heparin administered subcutaneously or in combination with intraperitoneal wash has been seen to reduce the risk of metastasis at this level and at port sites.

Tsivian and Sidi have suggested certain measures for reducing the risk of laparoscopic port site metastasis in urological surgery such as: a) sufficient technical preparation, b) avoidance of laparoscopic surgery in the presence of ascitis, c) avoidance of gas leakage from the trocar, d) avoidance of tumor injury, e) performance of prudent morcellation, f) use of watertight bags, g) use of bag for intact specimen elimination, h) placement of drainage, when necessary, before removing the pneumoperitoneum, i) washing of instruments, trocars, port sites and wounds with iodine and j) suturing of trocar wounds.³

For hand-assisted laparoscopic surgery, Chen and collaborators recommend using a watertight bag model, not enlarging the surgical wound if there is resistance when extracting the surgical specimen and changing gloves before wound closure in order to avoid contamination with malignant cells.

**CONCLUSIONS**

Port site metastasis in urological laparoscopic surgery is rare. Several factors have been associated with tumor seeding but tumor grade and stage appear to have the greatest importance. Nevertheless, risk can be minimized by applying open surgery oncologic procedural norms to laparoscopic surgery.

**BIBLIOGRAPHY**