



Short original – Renal cancer

Hand-assisted laparoscopic nephrectomy in challenging cases

P. López Cubillana, A. Prieto González*, J. I. Tornero Ruiz, A. I. López López, E. Cao Avellaneda, G. Server Pastor, J. F. Escudero, P. A. López González, G. Doñate, J. C. Ruiz Morcillo, G. Gómez Gómez and M. Pérez Albacete

Department of Urology, Hospital Virgen de la Arrixaca, Murcia, Spain

ARTICLE INFORMATION

Article history:

Received on 28 April, 2009

Accepted on 15 September, 2009

Keywords:

Nephrectomy

Renal tumor

Hand-assisted laparoscopy

A B S T R A C T

Objective: To assess the outcome of hand-assisted laparoscopic nephrectomy in patients with significant complicating clinical factors.

Methods: A retrospective assessment was made of 100 laparoscopic nephrectomies performed at a single hospital from 2001 to 2005. Patients with a history of prior abdominal surgery, prior procedures on the involved kidney, evidence of perirenal inflammation, renal lesions 10 cm or more in diameter, or level I renal vein thrombosis were enrolled.

Results: Twelve patients were enrolled. Of these, 5 had a lesion at least 10 cm in diameter, 2 had renal vein thrombosis, and 5 reported major abdominal surgery. Most patients had more than one of these findings. Three patients showed inflammatory conditions (staghorn calculi) and a T4 renal tumor was successfully treated without conversion to open surgery. Mean operating time and blood loss were 210 minutes and 310 ml respectively, while mean length of hospital stay was 3 days. No patient required conversion to open surgery.

Conclusions: Hand-assisted laparoscopic nephrectomy is an attractive minimally invasive option for technically challenging tumors and has reasonable operating times, blood losses, and complication rates.

© 2009 AEU. Published by Elsevier España, S.L. All rights reserved.

Nefrectomía laparoscópica asistida por la mano en casos difíciles

R E S U M E N

Objetivo: evaluar los resultados de nefrectomía laparoscópica asistida por la mano en pacientes con masas renales técnicamente complejas.

Métodos: se ha realizado una evaluación retrospectiva de 100 nefrectomías laparoscópicas realizadas en un solo hospital entre 2001 y 2005. Se ha seleccionado a los pacientes con antecedentes de cirugía abdominal previa, procedimientos previos en el riñón afectado, evidencia de inflamación perirrenal, lesiones renales de más de 10 cm de diámetro o trombosis venosa renal tipo I.

Palabras clave:

Nefrectomía

Tumor renal

Laparoscopia asistida por la mano

*Author for correspondence.

E-mail: antonioprietogonzalez@hotmail.com (A. Prieto González).

Resultados: se ha incluido un total de 12 pacientes; 5 de ellos presentaban una lesión de al menos 10 cm de diámetro, dos trombosis venosa renal y 5 referían cirugía abdominal mayor. La mayoría de los pacientes tenía más de uno de estos hallazgos. Tres pacientes presentaban procesos inflamatorios (cálculos coraliformes) y un tumor renal T4 fue tratado con éxito, sin necesidad de reconversión. El tiempo operatorio y la pérdida sanguínea medias fueron de 210 minutos y 310 ml, respectivamente, con una estancia media de tres días. Ningún paciente requirió reconversión a cirugía abierta.

Conclusiones: la nefrectomía laparoscópica asistida por la mano es una opción mínimamente invasiva, atractiva en el contexto de masas técnicamente complejas, con un tiempo operatorio, una pérdida sanguínea y una tasa de complicaciones razonables.

© 2009 AEU. Publicado por Elsevier España, S.L. Todos los derechos reservados.

Introduction

Hand-assisted nephrectomy combines the advantages of manual dissection and retraction, with the excellent vision and minimum morbidity provided by laparoscopy. From the description of the first laparoscopic nephrectomy, made by Clayman in 1991¹, the indications of laparoscopic nephrectomy have extended rapidly, and it is currently the standard treatment for renal masses². However, some patients with large masses, prior abdominal surgery, significant perirenal inflammation or renal vein thrombosis are still be challenging for laparoscopic surgeons. In these cases, hand-assisted laparoscopy may be a useful tool. We review the experience of our center with hand-assisted laparoscopic nephrectomy in these technically challenging cases.

Materials and methods

A retrospective assessment was made of 100 hand-assisted laparoscopic nephrectomies performed in our department from 2003 to 2007. Patients with a history of large masses, prior major abdominal surgery, prior procedures on the involved kidney, perirenal inflammation, renal lesions 10 or more cm in diameter or level I renal vein thrombosis were enrolled. This group was made up of 12 patients.

The presence of a renal mass over 10 cm in diameter of renal vein thrombosis was diagnosed using imaging methods and subsequently confirmed by the histopathological findings. Significant perirenal inflammation was associated histopathologically with the presence of chronic pyelonephritis. Patients were considered eligible for major abdominal surgery if they had wide incisions in the midline or on the side of the involved kidney. Some subjects had more than one of these inclusion criteria.

Hand-assisted laparoscopic nephrectomy is performed via a midline infraumbilical incision for the hand port and 2 or 3 trocars located in the right or left flank, with variations depending on the surgeon's preference and the patient's characteristics. All nephrectomy specimens were

taken from the hand port using watertight bags in cases of tumor pathology. Operating times, blood loss, hospital stay and intraoperative and postoperative complications were recorded.

Results

Of the 12 patients included in the series, 5 had lesions over 10 cm in diameter; 2 had renal vein thrombosis, 5 had undergone major abdominal surgery, 3 had a history of perirenal inflammatory conditions associated with staghorn calculi, and 1 patient was diagnosed clinically as T4. Some subjects had more than one of these criteria for surgical difficulty. Laparoscopic surgery could be performed in all cases without the need for conversion to open surgery. Mean operating time and intraoperative blood loss were 210 minutes and 310 mL, respectively. Mean length of hospital stay was three days. No significant complications were seen in these patients.

Discussion

Hand-assisted laparoscopic nephrectomy is a minimally invasive therapeutic option for technically challenging cases, such as large tumor size, intraperitoneal adhesions, significant perinephritis, renal vein thrombosis, etc. Hand-assisted laparoscopy shows some characteristics that facilitate the performance of surgery in these cases, without compromising the minimum morbidity provided by laparoscopic surgery³.

First, use of the hand access port through an open incision prevents potential damage resulting from blind trocar insertion in patients with intraperitoneal adhesions. Intraperitoneal access is responsible for 6-57% of lesions occurring during laparoscopy⁴.

Second, another advantage of hand-assisted laparoscopy is use of the hand for dissection of the anatomical planes, frequently altered in these patients with large renal masses (with perihilar adenopathies, prior surgery or perinephritis). A history of prior renal trauma, surgery, and recurrent infections with severe perinephritis is responsible for up to 50% of

open conversions in laparoscopic nephrectomy⁴. The greater sensitivity provided by hand-assisted laparoscopy as well as digital retraction reduce the risk of damaging the vascular pedicle. The most common complication of laparoscopic nephrectomy is vascular in nature⁵, caused by dense fibrosis, aberrant vascular bundles, etc. In cases of tumors with renal vein thrombosis, the thrombus can be palpated and displaced laterally before placing the endostapler.

Third, hand-assisted laparoscopic nephrectomy does not confer additional morbidity over standard laparoscopy. Estimated operating time and the blood loss were 210 minutes and 310 mL, respectively, while mean length of hospital stay was three days. These findings are similar to those of other groups who treated technically challenging cases⁶: renal masses larger than 7 cm⁷ and 10 cm in size⁸, or conditions with severe perirenal inflammation⁹. No patient required conversion to open surgery.

Conclusions

Hand-assisted laparoscopic nephrectomy is a minimally invasive surgical option in the context of technically challenging renal masses and has reasonable operating times, blood loss, and complication rates.

Conflicts of interest

The authors declare no conflicts of interest.

R E F E R E N C E S

1. Clayman RV, Kavoussi LR, Soper NJ, Dierks SM, Meretyk S, Darcy MD, et al. Laparoscopic nephrectomy: inicial case report. *J Urol.* 1991;146:278-82.
2. Ljunberg B, Hanbury DC, Kuczyk, Merseburger AS, Mulders PF, Patard JJ, et al. Renal cell carcinoma guideline. *Eur Urol.* 2007;51:1502-10.
3. Nelson CP, Wolf SJ. Comparison of hand-assisted versus standard laparoscopic radical nephrectomy for suspected renal cell carcinoma. *J Urol.* 2002;167(5):1989-94.
4. Siqueira TM, Kuo RL, Gardner TA, Paterson RF, Stevens LH, Lingeman JE, et al. Major complications in 213 laparoscopic nephrectomy cases: the Indianapolis experience. *J Urol.* 2002;168 4 Pt 1:1361-5.
5. Simon SD, Castke EP, Ferrigni RG, Lamm DL, Swanson SK, Novicki DE, et al. Complications of laparoscopic nephrectomy: the Mayo clinic experience. *J Urol.* 2004;171(4):1447-50.
6. Kalra P, Glassman DT, Gomella LG, Strup SE, McGinnis DE, Simon DR, et al. Outcomes of hand-assisted laparoscopic nephrectomy in technically challenging cases. *Urology.* 2006;67:45-9.
7. Stifelman MD, Handler TD, Nieder AM, Del Pizzo J, Taneja S, Sosa RE, et al. Hand-assisted laparoscopy for large renal specimens: a multi-institutional study. *Urology.* 2003;61:78-82.
8. Steinberg AP, Finelli A, Desai MM, Abreu SC, Ramani AP, Spaliviero M, et al. Laparoscopic radical nephrectomy for large (greater than 7 cm, T2) renal tumors. *J Urol.* 2004;172:2172-6.
9. Tan YH, Siddiqui K, Preminger GM, Albala DM. Hand-assisted laparoscopic nephrectomy for inflammatory renal conditions. *J Endourol.* 2004;18:770-4.