

From the Departments of Obstetrics and Gynecology and Urology, Hawaii Permanente Medical Group, Honolulu

# Laparoscopically Assisted Vaginal Extraction of the Kidney after Laparoscopic Radical Nephrectomy

By Christian S Sunoo, MD  
Randal A Aaberg, MD  
Joyce K Nakamura, MD

*We describe Hawaii's first retroperitoneal radical nephrectomy followed by laparoscopically assisted vaginal extraction of the kidney. This surgical procedure was a collaboration between laparoscopists from the Departments of Gynecology and Urology at the Kaiser Permanente medical center in Hawaii.*

## Abstract

**Background:** Gynecologists have long used a vaginal incision for surgical treatment of pelvic pathology. More recently, however, laparoscopy has allowed gynecologists and other specialists to replace laparotomy with minimally invasive surgical techniques. The combination of laparoscopic and vaginal approaches has increased the surgical armamentarium of both the gynecologist and the urologist.

**Case:** A gynecologist found a renal cell carcinoma in a 52-year-old woman. The Urology and Gynecology Departments of the Kaiser Permanente (KP) Hawaii Region (KP Hawaii) planned a combined minimally invasive surgical procedure that became Hawaii's first reported retroperitoneal radical nephrectomy followed by laparoscopically assisted vaginal extraction of an intact kidney.

**Conclusion:** Collaboration between laparoscopic surgeons in the Departments of Urology and Gynecology has allowed us to share surgical techniques and approaches to perform minimally invasive surgery instead of using more morbid large incisions of the abdomen or flank as required previously.

## Introduction

The primary treatment for renal cell carcinoma is surgery—either traditional radical nephrectomy, done through an open incision; or, more recently, laparoscopic radical nephrectomy, a procedure which uses minimally invasive surgical techniques.<sup>1</sup> Follow-up studies<sup>2,3</sup> have shown that laparoscopic radical nephrectomy has rates of morbidity, mortality and cancer-free survival similar to those associated with the open surgical approach.

Laparoscopic radical nephrectomy can be done either transperitoneally or retroperitoneally. Potential advantages of the retroperitoneal approach include direct access to the renal artery (because of the posterior position of the trocars) and shorter time in the operating suite (because mobilization of the bowel is not necessary). When nephrectomy is done as treatment for malignancy, extraction of the intact specimen offers the safest surgical approach, the lowest possibility of tumor cell seeding, and the most comprehensive pathology evaluation. To remove the intact specimen after laparoscopic nephrectomy, an incision measur-

ing 4- to 7-cm has been necessary.

The combination of laparoscopic nephrectomy with an incision in the vagina and vaginal extraction of the intact kidney has been described in the urologic literature<sup>4,6</sup> but to date has not been duplicated by our colleagues in the Hawaiian medical community. Indeed, one of the advantages of working at Kaiser Permanente (KP) Hawaii, a fully integrated health care organization, is our capacity for collaboration among multiple disciplines to provide the best-quality care for patients. This process gives us the opportunity to use the expertise of different surgical departments to quickly acquire the skills necessary to duplicate the successes of others as well as to develop innovative approaches to traditional surgical tasks.

## Case Report

A 52-year-old, gravida 4, para 4 woman was seen in the gynecology department for evaluation of pelvic pain. A computed tomography (CT) scan showed a 4-cm solid enhancing mass in the lower pole of the left kidney. The uterus and ovaries were unremarkable. Urologic consultation was obtained. The patient made an informed decision to proceed with laparoscopic radical nephrectomy and vaginal extraction.

At surgery, the patient was placed in the lateral decubitus position, left side up. Assisted by the gynecolo-



**Christian S Sunoo, MD**, (top) Assistant Chief, Honolulu Section Chief Department of Ob/Gyn, joined HPMG in 1989. Dr Sunoo has a special interest in operative laparoscopy. E-mail: christian.sunoo@kp.org.

**Randall A Aaberg, MD**, (left) Department of Urology, joined HPMG in 2001. Dr Aaberg has a special interest in operative laparoscopy. E-mail: randall.a.aaberg@kp.org.

**Joyce K Nakamura, MD**, (right) Chief, Department Ob/Gyn, joined HPMG in 1986. Vice President, Hospital Quality Improvement and Safety and Regional Director of Utilization Management. E-mail: joyce.nakamura@kp.org.

gist, the urologist performed the laparoscopic retroperitoneal radical nephrectomy using four ports. After completion of the nephrectomy, the kidney was placed into an Endo catch II bag (US Surgical, Norwalk, CT), and the drawstring was cinched down. Periaortic nodes were dissected, removed, and sent separately. The incisions were closed, and the patient was placed in the lithotomy position. An umbilical port was placed, and two 5-mm ports were then placed suprapubically and lateral to the epigastric vessels. With the patient placed in Trendelenburg and right lateral tilt position, the peritoneum was incised lateral to the left colon, and the retrieval bag containing the kidney was identified and pulled into the peritoneal cavity.

The laparoscope was pushed behind the uterus into the cul-de-sac so that the surgeon making the vaginal incision could see the light through the vagina. The drawstring was held down with a grasper at the cul-de-sac. The same surgeon made a transverse colpotomy incision using the light as a guide and grasped the drawstring, which was pushed through the vaginal incision from above. The vaginal incision was extended sharply and by stretching to approximately 5-cm. Using downward pressure from the lateral aspect of the grasper and pulling from the vaginal approach, the surgeon removed the intact kidney in the retrieval bag. The vaginal incision was closed with three figure-of-eight absorbable sutures.

The postoperative course was uneventful. Results of pathology examination showed a 4.0-cm renal cell carcinoma (T1a, N0, M0), Furhman grade 2.

## Discussion

The first laparoscopic nephrectomy was described in 1991.<sup>1</sup> In

1993, urologists first reported vaginal extraction of the intact kidney after laparoscopic nephrectomy.<sup>5,6</sup> Breda et al<sup>6</sup> reported extraction of a noncancerous kidney. As treatment for transitional cell carcinoma in one patient, Dauleh and Townell<sup>5</sup> removed one kidney via a retrieval

bag inserted through a vaginal port and in another patient removed one kidney intact but not protected by a bag. More recently, Gill et al<sup>4</sup> described ten cases of vaginal extraction of kidney after laparoscopic nephrectomy using a retrieval bag: In five cases, the transperitoneal approach was taken with the vaginal incision made via laparoscopy; in the other five cases, the retroperitoneal approach was taken (ie, the peritoneal incision was made from the retroperitoneum), and the vaginal incision was made laparoscopically. No cases of recurrence at the incision or port site have been reported.

## Conclusion

Presented from the gynecologist's perspective, this report describes vaginal extraction of the kidney by laparoscopic transperitoneal incision to retrieve the "bagged kidney" and transvaginal incision to enter the cul-de-sac.

In 1996, collaboration between the departments of urology and general surgery at KP led to the first laparoscopic nephrectomy for benign disease at our institution. Continued collaboration progressed naturally to use of laparoscopic radical nephrectomy as treatment for

**Desire to provide state-of-the-art care and surgical options for our patients—and to broaden our own surgical experience—led the departments of urology and gynecology to collaboratively perform this first reported operation of its kind in the state of Hawaii.**

malignant disease. Desire to provide state-of-the-art care and surgical options for our patients—and to broaden our own surgical experience—led the departments of urology and gynecology to collaboratively perform this first reported operation of its kind in the state of Hawaii. This continued shared work between surgeons

from different specialties has enabled our institution to take the next step in providing minimally invasive surgical options for this and other disease processes. ♦

## References

1. Clayman RV, Kavoussi LR, Soper NJ, et al. Laparoscopic nephrectomy: initial case report. *J Urol* 1991 Aug;146(2):278-82.
2. Gill IS, Meraney AM, Schweizer DK, et al. Laparoscopic radical nephrectomy in 100 patients: a single center experience from the United States. *Cancer* 2001 Oct 1;92(7):1843-55.
3. Ono Y, Kinukawa T, Hattori R, Gotoh M, Kamihira O, Ohshima S. The long-term outcome of laparoscopic radical nephrectomy for small renal cell carcinoma. *J Urol* 2001 Jun;165(6 Pt 1):1867-70.
4. Gill IS, Cherullo EE, Meraney AM, Borsuk F, Murphy DP, Falcone T. Vaginal extraction of the intact specimen following laparoscopic radical nephrectomy. *J Urol* 2002 Jan;167(1):238-41.
5. Dauleh MI, Townell NH. Laparoscopic nephroureterectomy for malignancy: vaginal route for retrieval of intact specimen. *Br J Urol* 1993 Nov;72(5 Pt 1):667-8.
6. Breda G, Silvestre P, Giunta A, Xausa D, Tamai A, Gherardi L. Laparoscopic nephrectomy with vaginal delivery of the intact kidney. *Eur Urol* 1993;24(1):116-7.