Videolaparoscopic Radical Hysterectomy Approach: a Ten-Year Experience

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ABSTRACT

Background: Because of the advancements in surgical techniques and laparoscopic instruments, total laparoscopic radical hysterectomy can now be performed for the treatment of uterine cervical carcinoma. We assessed the feasibility, complications, and survival rates of patients who underwent total laparoscopic radical hysterectomy with pelvic lymphadenectomy.

Methods: We retrospectively collected data from the medical charts of 29 patients who had undergone surgery between 1998 and 2008. The following data were assessed: age, staging, histological type, number of lymph nodes retrieved, parametrial measures, operative time, length of hospital stay, surgical complications, and disease-free time.

Results: The mean patient age was 37.07 ± 10.45 years. Forty percent of the patients had previously undergone abdominal or pelvic surgeries. Mean operative time was 228.96 ± 60.41 minutes, and mean retrieved lymph nodes was 16.9 ± 8.12. All patients had free margins. No conversions to laparotomy were necessary. Median time until hospital dismissal was 6.5 days (range 3–38 days). Four patients had intraoperative complications: 2 lacerations of the rectum, 1 laceration of the bladder, and 1 lesion of the ureter. Three patients developed bladder or ureteral fistulas postoperatively that were successfully corrected surgically.

Conclusion: Laparoscopic radical hysterectomy is feasible and has acceptable complications. The radicalism of the surgery must be considered, bearing in mind the parametrial measures and the number of lymph nodes retrieved.

Key Words: Laparoscopy, Radical hysterectomy, Cervical cancer, Complication, survival.

INTRODUCTION

Radical hysterectomy for the treatment of uterine cervical carcinoma was first described in 1895. The initial mortality rate for this surgery was high, approximately 19%.[1] In 1955, Meigs[2] published a report on a series of 100 patients who underwent surgery. All of them survived; thus, Meigs had introduced pelvic lymphadenectomy.

With good cure rates for the treatment of uterine cervical carcinoma, various strategies are being developed to reduce the morbidity associated with traditional treatments without compromising survival rates.[3] Videolaparoscopic surgical techniques have begun to play a significant role in the treatment of uterine cervical carcinoma.

The first description of laparoscopic radical hysterectomy (LRH) was by Nezhat et al[4] in 1992 when they described a procedure performed on a patient with uterine cervix 1A2. This procedure featured a 7-hour operative time and retrieval of 14 pelvic lymph nodes. However, only recently have authors started to publish their experiences with this surgical technique,[5–10] probably due to advancements in surgical techniques and materials. Comparative studies recently detected a shorter hospital stay and less blood loss[10,11] but longer operative times with laparoscopic access.[10–12]

In 1998, we started to use this surgical approach in our service, and presently it is the technique of choice for treating patients with initial uterine cervical carcinoma. This study describes the adaptation of the laparotomic technique proposed by the team and the experience with this technique, including 29 nonconsecutive patients operated on between 1998 and 2008.

METHODS

Data collection from medical charts was authorized by the Research Ethics Committee of Nossa Senhora da Conceição Hospital. All patients who underwent radical laparo-

scopic hysterectomy with pelvic lymphadenectomy between 1998 and 2008 were retrospectively registered, and patients with primary uterine cervical carcinoma between stages IA2 and IIA were included. For these patients, a radical hysterectomy type III was proposed.[13] Patients for whom the procedure was suspended intraoperatively due to tumor unresectability were excluded. All patients had the same principal surgeon (Dr Limberger) and signed the free, informed consent about the surgical technique. Previous surgeries were not considered adverse conditions for the performance of a laparoscopic surgery.

The following data were collected: age, staging, operative time, intraoperative complications, need for blood transfusion, hospital stay, histological type, number of lymph nodes retrieved, parametrial and vaginal cuff measures, postoperative complications, and follow-up time. Staging was performed clinically as previewed by FIGO.[14] The blood loss estimate was assessed by the clinical need for a blood transfusion according to the anesthetist. Postoperative complications were divided into early (up to 30 days postoperatively) and late. Patients were dismissed with intermittent vesical catheterization, prophylaxis antibiotics, and suspension of vesical catheterization. A urinary residue <100 mL was considered sufficient to suspend catheterization. The parametrial and vaginal cuff were measured in their larger extension postoperatively through insertion in the uterine cervix by one of the team members or by the pathologist who examined the specimen.

Surgical Technique

Radical Hysterectomy

First, the upper members are fixed along the body. Vesical catheterization is then performed with a #18 catheter, and a uterine manipulator with chrome-plated tubing is put in place. This is the appliance we consider the most appropriate, because it allows full uterine and vaginal manipulation without intercepting the approach of pararectal and paravesical spaces or the rectum and parametrium at all its points. Insufflation using a Veress needle and supraumbilical puncture with a 10-mm trocar for a 30° optical introduction is performed. Insufflation begins with 1 L/min until the introduction of 2 Lde CO_2 into the cavity, when we increase to the maximum insufflation available with the device. We work with pressures that vary from 15 mm Hg to 18 mm Hg, according to patient tolerance. Then we perform a revision of the peritoneal cavity followed by performance of 3 other 5-mm suprapubic punctures. Sealing and sectioning of the vessels of the infundibular pelvic ligament follows, a section of the round ligament is taken, an opening is made in the large ligament along the superior vesical artery, and a paravesical space up to the muscular planes is instituted. The pararectal space is over the ureter, which is identified posteriorly. This space is opened to liberate the rectum, and the ureter posteriorly and the parametrium anteriorly, until the pararectal space communicates with the paravesical space. Then a section of the uterine vessels in confluence with the internal iliac vein is taken, as is tissue from the parametrium close to the bone wall. Dissection of the vesicouterine peritoneum with rhomboid detachment of the bladder is accomplished, and gauze is introduced by using the optical trocar and opening the vagina. Cranial impulsion of the uterus and separation of the bladder from the vaginal wall is performed to the point of insertion of ureters. The ureter is detunnelized, removing it from the total extension of the parametrium until it penetrates the bladder wall, freeing it completely. Dissection of the paracolpium is performed to completely free the parametrium and the lateral wall of the vagina. This is done contralaterally. Dissection and liberation of the rectum from the posterior vaginal wall is performed to resect the entire uterosacral ligaments. Once the pneumoperitoneum is reversed, the uterine manipulator is removed, and extracting tweezers are used to preserve the pneumoperitoneum, which is fixed to the lateral opening and the uterine cervix. Circumferential sectioning of the vagina is then performed. The uterus is retrieved through the vagina, and physiological serum is applied by using a gloved finger to conduct vaginal tamponing to remake the pneumoperitoneum.

Pelvic Lymphadenectomy

Dissection starts in the external iliac artery then moves externally to the anterior fascia of the genitocrural nerve, continuing inferiorly to the Cloquet lymph node that is located internally by the hypogastric vessel, superior to the internal circumflex iliac vein and the internal inguinal orifice. Dissection continues over the Cooper ligament, moving down the internal wall of the iliac vein. Then the lymphatic ducts internal to the nerve and the obturating vessels are dissected close to the bifurcation of the iliac veins. Isolated dissection of the group of lymph nodes under the ureter and close to the common iliac veins is performed. These lymph nodes are maintained in gloved fingers previously marked to identify right and left. Performance is contralateral. The material is retrieved through the vagina. The cupola is sutured laparoscopically. Closed aspiration drainage is maintained until lymph collection is <100 mL in 24 hours.

Data were registered and statistical analysis was performed using version 6.04 b of Epi-Info software. Normal distribution variables are described with mean and standard deviation. Non-normal distribution variables are described using medians and percentiles.

RESULTS

From December 1998 to March 2008, 29 patients in stages IA2 and IB underwent videolaparoscopic radical hysterectomy and pelvic lymphadenectomy with the technique described above. No surgery was converted to laparotomy, and no patient experienced anesthetic complications. The mean patient age was 37.07±10.45 years, and the parity median was 2 children. Forty percent reported abdominal surgery or previous pelvic surgeries, predominantly cesarean deliveries.

Mean operative time was 228.96±60.41minutes, with a minimum of 150 minutes and a maximum of 420 minutes. Three patients needed intraoperative blood transfusions. Median time until discharge was 6.5 days. Histological types included epidermoid carcinoma (69%), adenocarcinoma (24.1%), and adenosquamous carcinoma (6.9%), with mean retrieval of 16.9±8.12 lymph nodes with a minimum of 7 and a maximum of 37 lymph nodes, 3 of which were positive lymph nodes. All surgical specimens had free margins. Parametrial measurements were taken for 23 patients, and vaginal cuff measurements were taken for 27 patients. The right parametrium measured 5.69±2.58 cm, and the left parametrium measured 5.64±2.72 cm. The median vaginal length was 2.7 cm (p 25%, 1.7; p 75%, 3.5).

Four patients had intraoperative complications. One patient had an accidental bladder lesion in the dissection of the anterior portion of the vagina, which was detected during surgery. A laparoscopic repair was performed. Another patient had a distal rectal lesion detected intraoperatively and corrected through the vaginal approach. The third patient had an accidental ureteral lesion detected intraoperatively and a ureter re-implantation was done laparoscopically with the placement of a JJ catheter. These patients improved with complete recuperation of function without major recurrences. The last patient had a rectal lesion detected on the first postoperative day, and an open loop colostomy in the descending colon was performed with an exhaustive flushing of the cavity. This patient developed sepsis, deep venous thrombosis, and was further required to undergo a vesicovaginal fistula correction during a subsequent hospitalization. This patient was disease-free for 4 years and fitted with a colos-

tomy pouch. The median hospital stay was 6.5 days with a minimum of 3 and a maximum of 38 days.

Eight patients had early postoperative complications: 3 had cystitis and received adequate antibiotic therapy; 2 had seroma; and 2 developed abdominal infection. All received adequate management. One patient developed a ureteral fistula on the 14th day postoperatively, which was initially unsuccessfully managed with a JJ catheter. She later successfully underwent a correction of the fistula 30 days after surgery. One patient developed a fistula on the second day postoperatively, which was corrected surgically but relapsed on the 15th day postoperatively. Four months after surgery, a left renal exclusion was diagnosed and a nephrostomy performed. Another surgical correction of the fistula was made 10 months after the LRH. Fifteen months after LRH, a left nephrectomy occurred due to pyelonephritis and a functional exclusion of the left kidney. This patient did not have new complications and has been disease free for 9 years.

Thirteen patients had late complications, 3 of which have already been mentioned. Six patients had cystitis. One patient developed a seroma with expectant conduct. Two patients had bladder insensitivity without urinary retention. One patient had a left ureteral fistula 37 days postoperatively, which was corrected successfully.

Follow-up data are available for 28 patients. Median follow-up time was 20.12 months with a minimum of 23 days and a maximum of 102.97 months. Nineteen patients (67.9%) were disease-free on the last consultation, 3 patients had controlled disease after relapse, and 6 patients died. One patient died due to primary breast cancer and the second due to primary bladder cancer, both without evidence of cervical carcinoma relapse. The 4 remaining patients died due to relapse or tumor metastasis. None of the deaths was due to surgical complications.

DISCUSSION

Feasibility and safety of laparoscopic radical hysterectomy has already been demonstrated in previous studies.[5–7] As of today, few are comparative studies, and we could not find any randomized prospective studies in the literature comparing videolaparoscopic and open techniques. Some controlled studies can be seen in **Table 1**, and comparative studies can be seen in **Table 2**.

In our series of cases, it was not necessary to convert to laparotomy, and only one patient needed a new intervention. Operative time and surgical complications[5–7] were similar to those described in other articles.[5–7,9] In the

Table 1.
Laparoscopic Radical Hysterectomy Without Laparotomic Control Group

Author	N	Operative Time (min)	Lymph Nodes	Follow-up (months)	Survival Rate
Spirtos[5] 2002	78	205 (150–430)	23.8	66.8	89.7%
Obermair[7] 2003	39	210 (60–410)		36.5	87.4%
Gil-Moreno[8] 2005	27	285 (CI95%:273.1–296.5)	19 (CI: 17.02–21.12)	32	100%
Ramirez[6] 2006	20	332.5 (275–442)	13 (9–26)	8	100%
Lee[9] 2007	76	228.9 (121–352) 171.8 (65–267)	21.1 (7–41) 15.9 (4–32)	12–60	1 relapse with death

Table 2.
Radical Laparoscopic Surgeries and Pelvic Lymphadenectomy Compared With Abdominal Radical Hysterectomy

Author	N*	Staging	Operative Time (min)*	Lymph Nodes*	Follow-up	Survival Rate*	Controls
Frumovitz[11] 2007	HRL 35 HRA 55		HRL 344 HRA 304†	HRL 14 HRA 19	-	-	History
Zakashanskyy[10] 2007	HRL 30 HRA 30		HRL 318.5 (200–464) HRA: 242.5 (75–353)†	HRL 31 (10–61) HRA 21.8 (8–42)†	-	-	Controls obtained by computer
Li 2007[12]	HRL 90 HRA 35	IB-IIA	HRL 262.99 ± 67.6 HRA 217 ± 71.56†	HRL 21.28 ± 1.39 HRA 18.77 ± 9.47	26 Months	HRL 90% HRA 86.25%	-

*HRL = laparoscopic hysterectomy; HRA = abdominal hysterectomy.

† $P<0.05$.

Spirtos series[5] (78 patients), a patient needed a blood transfusion, and 3 bladder lesions were found. Two patients needed laparotomies to control bleeding, and there was a vesicovaginal fistula. In the series published by Ramirez et al,[6] with 20 patients, one needed a blood transfusion, one had a bladder lesion, and one developed pneumomediastinum. One patient had a pulmonary embolism, one had late evisceration postoperatively, and one developed a lymph cyst. In Obermair's[7] study with 55 patients, 39 with uterine cervical carcinoma, 3 procedures were converted to laparotomy due to uncontrollable intraoperative bleeding. Two patients had pulmonary embolisms, one of whom died. One vesicovaginal and one rectovaginal fistula have occurred. In Lee's[9] case-control study, the performance of videolaparoscopic radical hysterectomy with bipolar pulse energy and conventional bipolar electro surgery in 76 patients were registered as a rectal laceration and a vaginal fistula.

Few studies have reported the survival time of patients. In the series published by Spirtos,[5] 3 patients had microscopically positive or short margins. The recurrence rate was 5.1% in 3 years. In another study with follow-up times of between 12 and 60 months, one death was observed due to tumor recurrence.[9] In Obermair's[7] series with a follow-up time of 36.5 months, 3 patients developed metastatic disease. In our study, the percentage of disease-free patients was 69% with a median follow-up time of 20.9 months. This survival time could be related to the fact that we included patients in stage IB2 whose survival rate is inferior.[15] The median tumor size in our study was 1.9 cm.

One of the concerns in oncological surgery is the radicalism of the resection. In our study, the number of lymph nodes removed was similar to that in some laparoscopic radical hysterectomy studies.[5,6,8] The feasibility of video-laparoscopic lymphadenectomy has already been described in comparative studies.[16] To assess histopathologic variables of patients who underwent radical laparoscopic hysterectomy[50] compared with historic controls,[48] a recent study analyzed surgical specimens obtained with both techniques. The measurements of surgical specimens were compared, respectively: right parametrium 3.8 cm (range, 2.3 to 6.5) and 3.4 cm (range, 1.7 to 7), P=0.59; left parametrium 3.6 cm (range, 2 to 6) and 3.5 cm (range, 1.5 to 6.5), P=0.82. The authors con-

cluded that extension of the surgical dissection seemed to be similar between the 2 techniques.[17] In our series, parametrial measures were similar to those described in this study

CONCLUSION

Surgical procedures were performed within an adequate time and observed complications seem to be acceptable and similar to those described in other studies. The radicalism of our surgical technique seems to be acceptable and similar to that described in other studies. The radicalism of a particular operation is contemplated, bearing in mind parametrial measures and the number of lymph nodes retrieved. Comparative randomized prospective studies are necessary to answer the questions regarding patient survival rates.

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