

Laparovaginal surgery in early cervical cancer

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Abstract

The aim of the study. To demonstrate the role of laparovaginal surgery as minimal invasive method in early cervical cancer. **Methods.** We operated 44 patients between 2006 and 2011, with cervical cancer IA2-IB1 stages in private practice. In 21 cases we performed radical trachelectomy with sentinel node sampling and in 23 cases radical vaginal hysterectomy (Schauta Stoeckel) with laparoscopic pelvic lymphadenectomy. The deep surgical technique is further presented. **Results.** This study presents the data concerning operative time, blood loss, and perioperative complication. **Conclusion.** Using the combination of vaginal and laparoscopic surgery we offer to the surgeon the possibility to conserve the anatomy and function in early cervical cancer. This study is relevant as it presents a significant number of patients with radical trachelectomy - a procedure not very frequently reported in the literature. The authors consider it significant also in regard with the 100% survival rate.

Keywords: cervical cancer, radical hysterectomy, radical trachelectomy, vaginal laparoscopic lymphadenectomy

Introduction

Contrary to radical vaginal hysterectomy, radical vaginal trachelectomy has a short history. In early '50 the Romanian E. Aburel envisioned a new procedure for the treatment of early cervical cancer called "Radical abdominal trachelectomy". The procedure has not enjoyed enormous popularity. In 1994, D'Argent imagined a similar technique by vaginal route to which the author associated laparoscopic pelvic lymphadenectomy⁽¹⁾. This study presents an original contribution in comparison with the two previously mentioned techniques - in one of them reporting a significant number as related to the total cases recorded in the literature.

Early stages represent 45% for all cervical cancers and 15% affect woman less than 40 years⁽²⁾. The surgery is the first step in the management for IA1-IB1 stages and the extend of procedure that depend of many factors is the choice of surgeon. The current trend is tailoring the radicality of the procedure for each case in order to reduce the invasively and preserve the anatomy and function as much as possible.

Reconsidering of the old vaginal surgery for cervical cancer including radical vaginal hysterectomy or radical vaginal trachelectomy was practiced since early '90s with the introduction of laparoscopy in gynecological oncology.

Querleu was the first who introduced the term laparoscopic assistance to vaginal radical hysterectomy in two types of radicality: Schauta-Americh and Schauta-Stoeckel techniques⁽³⁾. The laparoscopic assistance makes the pelvic lymphadenectomy and the removal of the lateral portion of the parametrium feasible during radical vaginal hysterectomy without the need for the muscle-cutting vulvovaginal incision (Suchchard)⁽⁴⁾ than the original techniques.

Dargent and Querleu introduced the concept of reducing the upper radicality by leaving the uterine body, the tubes and the ovaries in place and performing a radical trachelectomy instead of a radical hysterectomy in young patients with IA2-IB1 stage of cervical cancer who desire to preserve fertility. They are taking over the idea from Aburel, who performed the technique by abdominal route with pelvic lymphadenectomy. Adapting the technique to vaginal route and adding the laparoscopic lymphadenectomy, Dargent set a technique known as radical vaginal trachelectomy laparoscopically assisted. The author mentioned that "managing cervical cancer without opening the abdomen, while respecting the rules of radical surgery, a priori, appears attractive both for the patient and for the surgeon. Enjoying a faster recovery and bearing no visible scars is an advantage for the patient.

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Avoiding the drawbacks of a laparotomy and the concerns of wound healing is a benefit for the surgeon”⁽⁵⁾.

Methods

Between 2006 and 2011, 44 patients were operated with early cervical cancer (IA2-IB1) in the private hospital. Most patients come from collaboration with one private center for lower genital tract pathology. The majority of them (31, 67.3%) were represented by IB1 stage of cervical cancers, and IA2 stages were represented by 13 cases (28.2%).

Further, we performed radical vaginal trachelectomy with sentinel node sampling or pelvic lymphadenectomy in 10 cases with stage IA2 and 11 cases with stage IB1 cervical cancer. Radical vaginal hysterectomy Schauta-Stoeckel (class II Massi) with pelvic lymphadenectomy and sentinel node sampling was performed in 3 cases IA2 stage and 20 cases IB1 stages.

The median age for patients chosen for conservative surgery was 32 years and 18 patients were nullipara, while for the patients planned for radical vaginal hysterectomy the median age was 46 years and the mean parity was 1.1 (0-4).

The preoperative pathological diagnosis was made by cone biopsy for all IA2 stage cases and by targeted biopsy for IB1 stage cases.

The tumor type was represented by epithelial tumors in 89.1% (41 cases) and adenocarcinomas in 6.5% (3 cases, all in IB1 stage).

In all the cases we performed ultrasound and magnetic resonance imaging to appreciate the depth of stromal invasion and the presence of pelvic or paraortic adenopathy.

The selection criteria were based by clinical stage (IA2, IB1), the type of tumor (epithelial or adenocarcinomas), the dimension of the tumor (under 2 cm), the depth of stromal invasion under $\frac{1}{2}$, no lymphovascular invasion, lack of pelvic or paraortic pathological lymphnodes (on magnetic resonance imaging exam), no previous radiation.

Technique

Laparoscopic step

20 minutes before surgery we injected blue dye in four cardinal points of cervical mucosa. The transperitoneal route was gained by four ports (one for vision and three working ports). We looked for blue traces along the both pelvic vascular axis and we opened longitudinally the parietal peritoneum between round ligament and caudal division of parietocolic spaces. We dissected the medial peritoneal flap of large ligament in order to have a direct vision on the ureter and to perform a pararectal and paravesical spaces. We continued the dissection looking for the sentinel colored lymph node bilaterally. The sentinel node was sent to frozen section. In all cases we continued the pelvic lymphadenectomy, regardless the result sent from pathology. The laparoscopic lymphadenectomy includes removing all the lymph node bearing tissues located in the vasculo-nervous web, which makes up the parauterine ligaments.

For transvaginal radical trachelectomy the pelvic lymphadenectomy mark the end of the laparoscopic step.

For Schauta-Stoeckel radical vaginal hysterectomy laparoscopically assisted the surgery continues making the division of uterine artery and superficial uterine vein after their dissection, transection of round ligament and infundibulopelvic ligament. Additionally we performed the opening of the rectouterine pouch and transection of sacrouterine ligaments. This technique facilitates the vaginal step offering a good mobility to the uterus. In the same way the anterior fold of large ligament and vesicouterine peritoneum can be opened and ongoing to dissect the vesico-uterine space.

Vaginal step

In both alternatives of radical surgeries for early cervical cancer described above, the vaginal operation has the same steps concerning

Table 1 Operative time in minutes (mean, range and SD)

	Laparoscopic time	Vaginal time	Total
Radical trachelectomy	106.8(85-135) ±20.9	35.2(20-50) ±7,7	142(105-200) ±23.4
Radical hysterectomy	134.6(75-210) ±42.2	51.5(35-60) ±9.7	186(115-245) ±39.7

the dissection of vesico-vaginal or recto-vaginal spaces, freeing of the sacrouterine and vesicouterine ligaments. The difference is the level and the amount of tissue of cardinal ligament following to be cut.

Making vaginal cuff is the first technique taking care to not cut too much the vaginal length. We prefer to continue in posterior zone opening the pouch of Douglas and to transect the sacrouterine ligaments. The next step is the dissection of vesico-vaginal space and opening the paravesical spaces to emphasize the bladder pillars. The ureter follows to be freed partially for radical trachelectomy and complete for radical vaginal hysterectomy. The parametrial transection offers the character of radicality for both operation. For radical trachelectomy the next step was section of cervix at the level of internal os, the cerclage of uterine stump and uterovaginal anastomosis. For radical vaginal hysterectomy extraction of the uterus and adnexa enable the closing of the vaginal vault.

All the cases were operated under general anesthesia, with tromboembolic and infection prophylaxis.

Results

Operative time

The mean operative time for radical trachelectomy was 142 minutes (range 105-200, SD=23.4), vaginal step registered 35.2 minutes (range 20-50, standard deviation SD=7.7) and for laparoscopic step was 106.8 minutes (range 85-135, SD=20.9). For radical vaginal hysterectomy the mean operative time was 186,2 minutes (range 115-245, SD=39.7) considering laparoscopic step 134.6 minutes (range 75-210 minutes, SD=42.2) and vaginal step 51.5 minutes (range 35-60, SD=9.07, Table 1). Globally laparoscopic step represents for both operations three times much more than vaginal step. The large variation in operative time for laparoscopic step in radical vaginal hysterectomy was due to technical difficulties encountered in obese woman.

Blood loss

Blood loss was appreciated measuring intraoperatively the blood aspirated in the time of both steps laparoscopic and vaginal. The mean blood loss for radical trachelectomy was 539.2 ml (between 280-760ml) for laparoscopic time 254.9 ml (between 120-560 ml) and for vaginal step 284.2 ml (between 120-440

Table 2 The blood loss appreciated intraoperatively

	Laparoscopic step	Vaginal step	Total
Radical trachelectomy	254.9 (120-560 ml)	284.2 (120-440 ml)	539.2 (280-760 ml)
Radical hysterectomy	318.6 (200-700 ml)	355 (150-500 ml)	647 (350-950 ml)

Table 3 The distribution of the sentinel node from anatomically point of view

	Right	Left	Bilat.	Total
Obturator group	8 (19%)	2 (4.7%)	1 (2.3%)	11 (26.1%)
Interiliac group	14 (33.3%)	10 (23.8%)	7 (16.6%)	31 (73.8%)
Total	22 (52.3%)	12 (28.5%)	8 (19.04%)	42



Figure 1. Radical trachelectomy. General aspect of left side of the uterus 20 minutes after blue dye injection

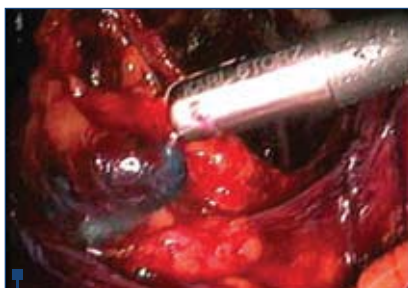


Figure 2. Radical trachelectomy. Dissection of sentinel node in interiliac group (right side)

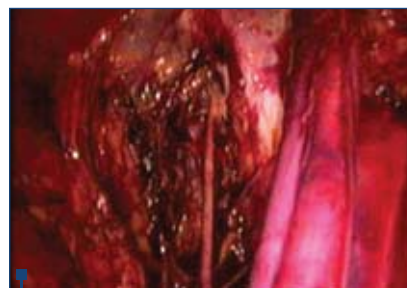


Figure 3. Radical trachelectomy. General aspect after pelvic lymphadenectomy (right side)



Figure 4. Radical trachelectomy. Sentinel node in external iliac group (left side- same case as Figure 3)



Figure 5. Radical trachelectomy. Aspect of cervix after conization (IA2 cervical carcinoma)



Figure 6. Radical trachelectomy. Marking the limits of vaginal cuff



Figure 7. Radical trachelectomy. Incision of anterior vaginal wall



Figure 8. Radical trachelectomy. Closing the vaginal cuff



Figure 9. Radical trachelectomy. Anterior dissection of vesico-vaginal space and cervico-vaginal septum

ml). The mean blood loss for radical vaginal hysterectomy was 647 ml (between 350-950 ml), for laparoscopic time 318.6 ml (between 200-700 ml) and for vaginal step 355.3 ml (between 150-500 ml). In general, in radical vaginal hysterectomy the blood loss was with 20% higher than radical vaginal trachelectomy. The fall in hemoglobine level after 24 hours postoperatively was up to 8 g/dl and we consider transfusion not necessary.

Sentinel node

The sentinel node dissection was performed in all cases. In 41 (89.1%) of cases the sentinel node was negative at frozen section and pathological definite. In 3 cases (6.5%) with IB1 stage of cervical cancer, the sentinel node was positive in left interiliac lymphnode

group. In 4 cases (8.6%) we did not found the sentinel node. In the rest of 40 cases the sentinel node was found in two main localizations: the obturator and interiliac lymphnode group (Table 3). The most common localization was the interiliac group in 31 cases (73.8%); in 14 cases (33.3%) in the right side, in 10 cases (32.8%) in the left side and in 7 cases (16.6%) bilaterally.

Perioperative complications

Incidental hemorrhagia was defined as unexpected blood loss and was encountered in 3 cases (6.6%) in the time of laparoscopic step due to breaking of obturator vein or tributaries. We had only one bladder wound discovered and fixed in same vaginal step. We have not made intraoperative laparoconversion. The

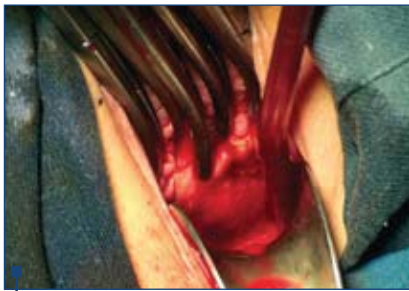


Figure 10. Radical trachelectomy. Dissection of recto-uterine space



Figure 11. Radical trachelectomy. Transection of left utero-sacral ligament



Figure 12. Radical trachelectomy. Identification of left vesico-uterine ligament



Figure 13. Radical trachelectomy. Freeing of left vesico-uterine ligament



Figure 14. Radical trachelectomy. Transection of cervico-vaginal branch of left uterine artery



Figure 15. Radical trachelectomy. Transection of left cardinal ligament



Figure 16. Radical trachelectomy. Amputation of the cervix at internal os level



Figure 17. Radical trachelectomy. Utero-vaginal anastomosis



Figure 18. Radical trachelectomy. Final aspect

late complications were represented by one lymphocyst, a three months postoperatively laparoscopically resolved.

All the patients were encouraged to walk and eat in first 12 postoperative hours. The drainage was suppressed in the second postoperative day.

Functional outcome

In all cases which performed radical trachelectomy, the menstrual function was resumed in the first menstrual cycle. Three patients (6.5%) became pregnant one year after surgery. Two patients aborted a 12 and 14 weeks of gestation, respectively. One was able to carry the pregnancy and delivered at 37 weeks of gestation by cesarian section.

Patients who performed radical vaginal hysterectomy had no urinary or sexual dysfunction.

Oncological follow-up

All patients were followed up at three months in the first year and then at six month. Clinical exam, copoloscopy and Pap smear were done every six month, computer tomographs scan every year. We did not observe any sign of recurrence in our patients (Figures 1-18).

Discussion

The vaginal approach in cervical cancer started in 1888, when the Czech surgeon Pawlik⁽⁶⁾ performed the first radical vaginal hysterectomy, 13 years before Schauta performed this operation.

Vaginal surgery was reinstated in the last 20 years in general gynecologic surgery and

also in gynecologic oncology. The vaginal route can be assimilated as natural orifice surgery, a modern concept in nowadays surgery. Out of the benefits of postoperative outcome in the vaginal route offer the possibility for an anatomical approach for extirpation of uterus and parametria in cervical cancer surgery. The main advantage is the possibility to modulate the extent of surgery from radical to conservative concerning the preservation of anatomic and functional with less invasively than open surgery. We used the type II radical vaginal hysterectomy (from Massi classification) allowing the less radical dissection of the anterior parametrial and the preservation of the vascular network surrounding the distal tract of the ureter. Thus the incidence of injuries to the ureters and the hazard of fistula formation are decreased. Moreover, complete removal of the lateral parametria, although reducing the possibility that neoplastic cells are left behind in that area, does not result in significant damage to bladder and rectal functions⁽⁷⁾.

Dargent and Salvat⁽⁸⁾ described in 1987 the first laparoscopic retroperitoneal lymphadenectomy and between 1986 and 1992 they operated 95 cases with panoramic retroperitoneal lymphadenectomy associated to Schauta radical hysterectomy. Querleu was the first who introduced the term laparoscopic assistance to vaginal radical hysterectomy⁽⁹⁾.

The association between vaginal surgery and laparoscopy opened the door to a new stage in gynecologic oncology.

The sentinel node concept represents an important factor for preoperative stadialisa-

tion in cervical cancer. The negative sentinel node allows the possibility to perform in the same time pelvic lymphadenectomy and radical vaginal hysterectomy or in the cases where woman wants to preserve her fertility, radical trachelectomy. We consider the positive sentinel node as guide for the therapeutic attitude concerning the necessity of radiation or open radical surgery. Until present, approximately 800 radical vaginal trachelectomies have been done worldwide. Our study represents a contribution of approximately 2.5% of those. This study, therefore, is relevant as it presents a significant number of patients with radical trachelectomy. Radical vaginal hysterectomy requires a considerable experience in vaginal surgery and we believe that the contribution in over 3000 vaginal hysterectomies performed by the authors guarantees the quality of the surgery described in the study.

The operative time is variable depending on the complexity of the case. Kadar and Reich communicate a case operated in ten hours⁽¹⁰⁾. In our study the mean operative time was below that can be found in literature^(11,12).

Conclusions

Vaginal and laparoscopic surgery represents the minimal invasive alternative for open surgery in early cervical cancer. The postoperative outcome consists in rapid recovery and reduced complication. This study is relevant as it presents a significant number of patients with radical trachelectomy - a procedure not very frequently reported in the literature. The authors consider it significant also in regard with the 100% survival rate. ■

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