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Radical hysterectomy: Past, present, and future

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Summary

After an analysis of 3,441 radical hysterectomies performed in our department, we found, after modification of the operative technique in 1983, the more lateral the excision the less the recurrence rate. The recurrence rate for Stage 1b-2a and Stage 2b patients comparing the years before 1983 to the years after decreased to 12.4% from 15.7% (158/1,006 vs 268/2,163; p = 0.009) in Stage 1b-2a and 24.6% from 55.8% (38/68 vs 47/191; p = 0.0007) in Stage 2b, respectively.

With the modern trend of aspiring for an easier lifestyle, most physicians practice earlier. Therefore only very few physicians study radical hysterectomy. As the skill of surgery needs a longer period of education and training, it may only interest physicians who work with medical professionals as part of a team at a medical center.

In the future, we should provide gynecological residents not only with a training program using the classic textbooks, but also with different points of view on changes and developments in radical hysterectomy. We hope to promote an attitude of offering patients access to different choices and opportunities of therapy. Radical hysterectomy is in fact a treatment option for patients with bulky cervical lesions and Stage 2b in particular.

Key words: Cervical cancer; Radical hysterectomy; Training program.

Introduction

Both irradiation and type 2 radical hysterectomy are currently used and available in the treatment of early invasive carcinoma of the uterine cervix with equal results. With the technique offered in type 2 radical hysterectomy, the recurrence or survival rate did not improve because of the limitations of lateral excisions. After the technique mentioned was modified, a wider lateral excision achieved a lower recurrence rate in early invasive cancer generally, but more so particularly in locally advanced cervical cancer.

Hopefully the technique we provide and the results we have achieved can stimulate gynecologists of high quality to join us in improving the quality of life and the survival rate of patients as well.

In the past

Radical hysterectomy (RH), now an established therapy for early invasive cervical cancer, has generally been attributed to Wertheim of Vienna. The purpose of the operation is removal of the cervical tumor, uterus, parametrium, and upper vagina, together with the pelvic lymph nodes. This technique is the most standard procedure recognized today. However, Wertheim recommended removal of the pelvic nodes only when they were palpably enlarged. The surgical mortality rate of 8% with a survival rate of 50% was quite commendable in those early days. In general the excised pelvic nodes should include the obturator, internal iliac, external iliac, and common iliac lymph nodes. Complete excision of the internal iliac artery and vein was once performed as part of this operation. However since it was associated with increased fistula formation, it has consequently been abandoned [1-3].

The surgical technique was somewhat modified thereafter by Okabayaski in 1921 and Meigs in 1939. The techniques of Piver, Rutledge and Smith reported on the five types of RH in 1974 were adopted afterwards by many others. The operation did not become popular until 1967. It was generally accepted after an analysis of the results of a 30-year prospective study comparing radiotherapy and surgery. The results also confirmed later that the therapeutic morbidity of these two modalities was comparable and Stage 1b-2a has been adequately treated with RH ever since [4-7].

The vast majority of patients with Stage 2b and above were routinely treated by radiotherapy or combined chemoradiotherapy. Little has been written about surgery as a primary treatment of choice. The only series was reported by Zander of Germany in 1981 from an analysis of the results of a 20-year cooperative study dealing with 1,092 patients who had surgery only. The 5-year survival rate was 71.1% in Stage 2 of which most were Stage 2a [8].

The surgical technique we performed in our early efforts on 270 cases in the period between 1963 and 1972 was complete dissection of the pelvic nodes followed by RH. The operation consisted of removing, through an abdominal incision, pelvic tissue in two steps: 1) the pelvic lymph nodes extending from the external and internal iliac vessels, the obturator fossae and the lateral walls of the pelvis, together with 2) the uterus, at least one-third of the vagina and a part of the parametrium.

This standand protocol was reversed on 804 patients who received RH from 1973 to 1982. The uterine artery on both sides was first ligated followed by RH. The last step was dissection of the lymph nodes. The part of the parametrium,

close to the uterus, similar to Meig's type 2 RH, was excised. This change reduced the hemorrhage rate to a minimum, however, the technique itself compared with the period prior to 1972 did not change much. The complication rate (CR) of hemorrhage and vaginal fistula in this period from 1963 to 1982 was 8% and 4.9%, respectively. The recurrence rate (RR) was 15.7% (158/1,006) in patients with Stage 1b-2a and 55.8% (38/68) in patients with Stage 2b.

Our technique was changed once again after 1982. For wider lateral excisions the ureteral tunnel was dissected and the vesicouterine ligament was divided to achieve an adequate excision which includes the removal of paravaginal and paracervical tissue in addition to the parametrium. Paraaortic lymph node dissection was limited to patients with enlarged paraaortic lymph nodes or positive pelvic lymph nodes proven by frozen section biopsy during surgery [9, 10]. This concept of an adequate lateral excision was supported by a prospective study later. The subclassified parametrium specimens of 262 patients with Stage 1b-2a undergoing RH were evaluated. The study showed that the frequency of pelvic lymph node metastasis was 71.4% in patients with paravaginal invasion, 57.7% in patients with paracervical invasion, and 66.7% in patients with paracorporal invasion. The frequency of pelvic lymph node metastasis was 4.0% in patients who had tested negative for invasion of the paracorpus, paracervix, or paravagina. As tumor cells tend to spread laterally and inferiorly in the parametrium, patients with more advanced disease and possibly pelvic lymph node metastasis required adequate lateral excision and complete pelvic lymph node dissection [11].

In our series of 2,367 patients with Stage 1b-2a after 1982 available for study, 2.0% (48/2,367) had hemorrhaged and 2.4% (57/2,367) had fistulas. The RR was 12.4% (268/2,163) in Stage 1b-2a patients and 24.6% (47/191) in Stage 2b patients. The difference in CR and RR comparing the years before 1983 to the years after was significant (Tables 1 and 2). Based on our randomized study of 309 patients with Stage 2b cervical cancer available for analysis, the long-term survival rate for 105 patients primarily treated with RH at five and ten years was 68% and 59%, respectively. For the 204 patients who underwent radiotherapy, the survival rate was 52% in five years and 42% in ten years. The difference in the comparison of radiotherapy and surgery was significant (p = 0.006) [12].

Table 1. — Complication rate (CR)
(No. = 3,441, Stage 1b-2b, from 1963-2004).

Major complications (no. of pts)	CR (%)	
	1963-1982	1983-2004
Hemorrhage (134)	8.007 (86/1,074)	2.028 (48/2,367) (1)
Fistula (110)	4.935 (53/1,074)	2.408 (57/2,367) (2)

(1) $p < 0.006$; (2) $p < 0.002$.

Table 2. — Recurrence rate (RR)
(No. = 3,428, Stage 1b-2b, from 1963-2003).

FIGO (no. of pts)	RR (%)	
	1963-1982	1983-2003
1b-2a (3,169)	15.7 (158/1,006)	12.4 (268/2,163) (1)
2b (259)	55.8 (38/68)	24.6 (47/191) (2)

(1) $p = 0.009$; (2) $p = 0.007$.

At present

With medical advances and the increasing capabilities of surgical procedures, the risk of operation has in fact been progressively reduced. This has permitted the application of surgery to patients at a more advanced stage. The technique of RH with pelvic lymph node dissection has undergone numerous modifications since its original description decades ago. It also has been changed three times to more extensive excisions in our department.

After more than 3,400 procedures of RH and long-term follow-up of patients, we have found that adequate lateral excision is mandatory and pelvic node metastasis is one of the most significant risk factors associated with cervical cancer [13-15].

Based on the data evaluated, we recognize that our latest operative technique modified after 1982 has contributed to the results achieved. With the present technology, we recommend that the more extensive operation we are using now be applied to invasive cervical cancer, especially in patients with a larger cervical lesion and those with more advanced stage disease. This group of cancer patients has a tendency toward lateral extension into the paravaginal, paracervical and parametrial tissue and then into the pelvic lymph nodes. It encourages us to widely excise the tissues attached to the cervix as much as possible and to also extirpate the pelvic lymph nodes. The availability of our technique mentioned may also explain the significant reduction in the number of recurrences after 1982 since the bilateral tissues of the uterus, cervix, and vagina were not adequately excised before then. Satisfactory results have been achieved, particularly in patients with Stage 2b disease [16-24].

With the advances of imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI), parametrial and pelvic lymph node invasion can be accurately predicted, especially in negative imaging findings. In our pretreatment assessment, comparing the histopathologic findings, it was 100% accurate when the parametrium was negative and 81.8% when the parametrium was positive. A combination of CT and MRI assessments thus constitutes an essential procedure not only for clinical staging but also for therapeutic decisions and follow-up evaluation. In fact these imaging systems do not change the FIGO clinical staging but must be considered as a guide for surgical judging [25, 26].

We established a system to provide a training program for surgeons. Surgeons performing this type of operation should have complete knowledge of pelvic anatomy and therefore be skilled technicians with sufficient experience and the ability to lead a team to minimize morbidity and to achieve a maximum rate of cure. Those performing this surgery

should therefore have at least six years of experience beginning from the first year of residency with the last two years focused on the training of this skill. In our department the first three years of residency involve training of a more basic nature. Only residents in the fourth year are permitted to act as second assistant in this surgery, progressing to first assistant later in the year. In the fifth and sixth years these doctors will mainly work with the cancer team as the first assistant and as the surgeon under supervision on selected occasions. Only if they are good and persistent can they remain with our department, and become totally independent.

The future

Today we agree that radiotherapy and radical surgery are equivalent in curing patients with early cervical cancer. Patients beyond Stage 2a are generally transferred to non-surgical treatment. Radiation therapy is presently the therapeutic method of choice in most patients and the only choice of treatment for patients with advanced stage carcinoma of the cervix. This is based generally on the assumption that radiation therapy is more effective than radical surgery. It is perhaps a reason why most cancer centers worldwide do not have such qualified surgeons. A vicious cycle is created by this belief, whereby the deficiency of surgeons for this operation becomes a setback in the training of more qualified surgeons, thus perpetuating the belief that surgical treatment does not compare with radiotherapy. With the surgical technique we use, we hope that a sound comparison of different therapeutic modalities can now be made. To accomplish this objective, however, education and training for these techniques will be essential for surgeons who are capable of performing the operation and providing the best and most modern care for their patients. Hopefully in the near future, by means of this surgical technique, surgery will once again be widely accepted as an alternative treatment for late stage cervical cancer, as it is now for the earlier stages. In fact the overall 5-year survival rate of patients with cervical cancer at Stage 2 and 3 treated by radiation therapy at various centers throughout the world presented in the annual report was 58.9% and 32.8%, respectively [27]. There are few data concerning radical surgery in treating patients with advanced disease. The reported high incidence of pelvic lymph metastases of patients with early stage disease who were treated primarily with RH and pelvic lymphadenectomy confirmed by our department and others makes an assumption that radical surgery should be reconsidered for patients with advanced stage disease as it treats both the primary tumor and the regional lymph nodes [28, 29]. Again we confirmed this concept later on from the results we achieved that RH can be applied to both early and advanced stage cervical cancer.

The current trend provides an optimum environment for the treatment of patients who are highly concerned about the individualized method of treatment and quality of life that comes along, rather than simply following a standard procedure in every instance. A patient should be well informed during each stage of cervical cancer, whether early or advanced. Patients have the right to know and deserve to have a choice if such disease exists.

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