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Pelvic Exenterative Therapy and Recurrent Pelvic Carcinoma[1]

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During the nine year period from June 1, 1965 to June 1, 1974, 69 patients were treated with some type of pelvic exenteration at the University of Michigan Medical Center. Total pelvic exenteration was performed in over 75% of the cases. The overall absolute 5-year survival rate was 60%. The surgical mortality in the series reported was 1.5%. The importance of various technical points to include "ski positioning" of the patient on the operating table, utilization of the transverse lower abdominal incision for operative exposure, development of a peritoneal graft to be used as a "diaphragm" at the level of the levator ani muscles, preparation of a ureterosigmoid conduit for urinary diversion and prophylactic compartmentalization of the inferior vena cava are described. A split thickness skin graft vaginoplasty if desired is performed at a later date.

INTRODUCTION

For almost forty years all patients with gynecologic malignancy referred to the Department of Obstetrics and Gynecology at the University of Michigan Medical Center have been presented to the Gynecology Tumor Conference which convenes twice weekly for final evaluation and outline of treatment. During the nine year period from June 1, 1965 to June 1, 1974 over 2 300 patients were presented to this conference and all forms of therapy were considered in the evaluation of these patients. Approximately 82% of the patients were considered for therapeutic management directed toward primary malignancies of the vulva, cervix, uterus and ovary. These therapeutic modalities included major or radical pelvic surgery, radiation therapy and/or chemotherapy as directed by the members of the Tumor Board. Eighteen per cent of the total number of patients seen in the conference were evaluated for treatment of some type of recurrent gynecologic neoplasm. A major portion of this study was presented to the VII World Congress of Gynecology and Obstetrics in Moscow, Russia in August of 1973.

SELECTION OF CASES

During this nine year period, 418 or approximately 20% of the patients were evaluated for recurrent or persistent pelvic neoplasm subsequent to primary therapy. An additional 13 patients were evaluated for pelvic exenterative surgery because of the extent and location of the disease; e.g., extensive carcinoma of the vulva.

Of the 431 patients, 213 or approximately 50% of them were not considered candidates for pelvic exenteration since the extent of the recurrence demonstrated by evidence of distant metastasis outside of the pelvis or by extent of the local pelvic process precluded surgical intervention. Radiation of pain because of sciatic nerve involvement, swelling of one or both of the lower extremities caused by vascular or lymphatic permeation by tumor and signs of ureteral obstruction were considered contraindications to surgical exploration. Ureteral obstruction alone, however, was not considered a contraindication.

Forty-three (10%) patients had recurrent carcinoma of the ovary. These patients were not considered candidates for pelvic exenterative therapy since this condition when sufficiently extensive to be considered for this type of operation does not respond well and it is therefore contraindicated. Another 65 (15%) patients were not considered candidates for surgery for the following reasons: type and extent of other pelvic neoplasms; physical, mental and emotional status and religious beliefs. Age of the patient per se, on rare occasion, was considered the only contraindication for obvious reasons.

[1] Presented (in part) at the VII World Congress of Gynecology and Obstetrics, Moscow, Russia, August 16, 1973.

Table I. *Type of pelvic neoplasm*

Type	Number	Per cent
Cervix	38	55.1
Vagina	14	20.3
Colon	7	10.2
Vulva	5	7.1
Uterus	4	5.8
Urethra	1	1.5
Total	69	100

110 patients (25%) were considered candidates for exploratory laparotomy to determine the resectability of the malignant neoplasm with therapeutic curability rather than palliation the ultimate goal. In a little more than 55% of these cases the primary diagnosis was recurrent carcinoma of the cervix (Table I). Lesions of the vulva, vagina, uterus, colon and urethra were also treated in this manner. Of the 110 patients who were explored 69 (63%) of them proved to be candidates for some form of pelvic exenteration. Fifty-four (78%) of the patients in the operative series were treated with total pelvic exenteration. Eight (12%) patients were treated with posterior pelvic exenteration and 7 (10%) patients were treated with anterior pelvic exenteration when the lesion was sufficiently localized to justify the less radical procedure.

OPERATIVE METHOD

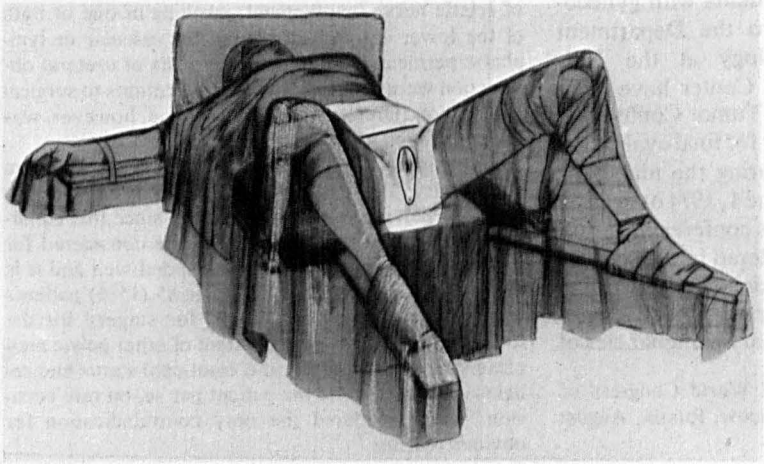
In all cases, the preoperative treatment followed a standard regimen that included all related laboratory and X-ray examinations, appropriate consultations, bowel preparation and prophylactic antibiotic therapy. Although routine antibiotic prophylaxis may be questionable in some types of surgery, it is generally advisable for procedures where contamination is likely as with the gastrointestinal and genitourinary tracts (1).

In the operating room the patient is placed on the table in the "ski position" (Fig. 1) which gives simultaneous access to the abdominal and perineal areas, not only for palpation of the lesion but also for the performance of the operative procedure itself. The abdominal cavity is entered through a transverse incision with transection of the rectus muscles bilaterally. The transverse lower abdominal incision is considered the incision of choice since it provides increased ease of operability and the complications related to abdominal wounds are decreased significantly.

Prior to the performance of the pelvic exenteration, the upper abdomen is explored thoroughly for evidence of metastatic disease, for if neoplasm is identified above the level of the pelvic brim, the procedure is terminated and the abdomen is closed. The pelvic contents are evaluated in a similar fashion to determine the resectability of the lesion. As stated above, it is felt strongly that this operation with its subsequent prolonged rehabilitation should not be undertaken as a palliative procedure.

A peritoneal graft or flap (Fig. 2) to be used in the pelvic floor closure, if the radical resection is to be undertaken, is developed upon entrance into the abdominal cavity (2). A transverse incision into the peritoneum is made approximately halfway between the trans-abdominal incision and the level of the umbilicus. The flap is further developed by a linear incision of the peritoneum along the left lateral abdominal wall. The lower transverse incision of the peritoneal flap is made after the upper part of the bladder has been reflected off the peritoneum and this incision is extended across to the right lateral abdominal wall where it remains attached in continuity or "hinged" for later use. The peritoneal flap measures approximately 8 by 20 cm.

Fig. 1. "Ski position" utilized in pelvic exenteration with draping and incisions illustrated.



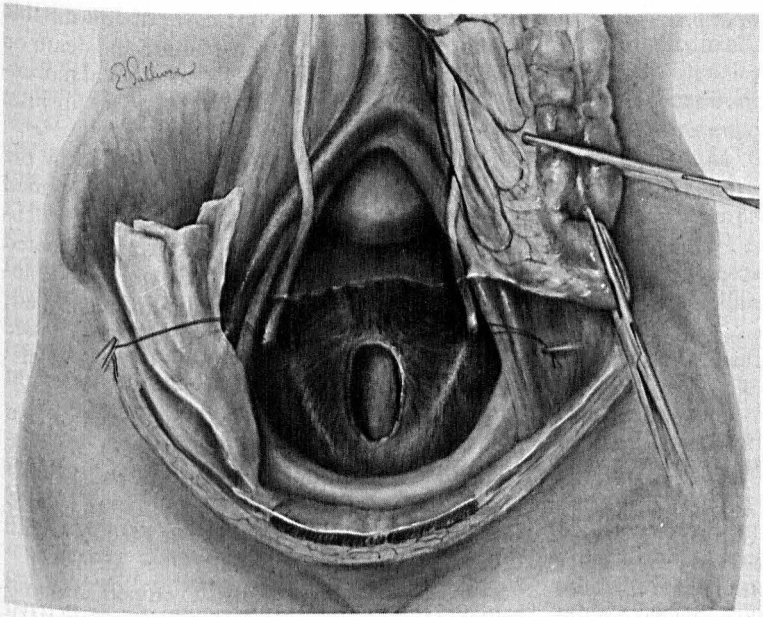


Fig. 2. Peritoneal graft prepared from anterior parietal peritoneum. Used to cover the pelvic aperture.

An en bloc dissection with removal of the female reproductive organs, the vagina, the distal third of the ureters, the bladder anteriorly and the bowel posteriorly, when indicated, is then performed. The hypogastric arteries are ligated but not transected. The vulvar tissues are not removed unless indicated by the extent or location of the disease. This allows for a better cosmetic result especially if one constructs a neovagina at a later date.

Once the en bloc dissection has been completed and a bilateral pelvic lymph node dissection has been performed, the inferior vena cava is exposed on three sides at the level of L-4 and L-5 vertebra. By means of a Codman stapler the inferior vena cava is divided into

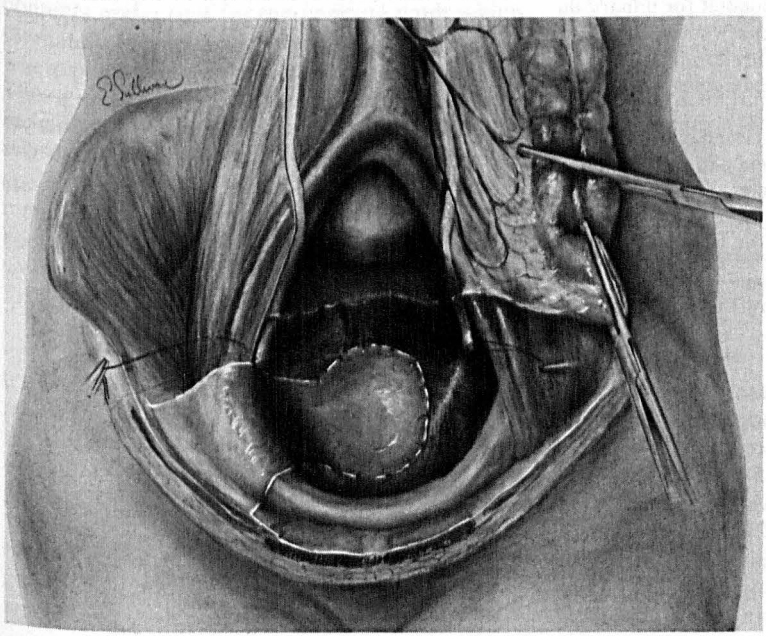


Fig. 3. Peritoneal graft in place as a flap attached to the pelvic aperture at the level of the pelvic diaphragm.

Table II. *Postoperative complications*

Type	Number
Septicemia	15
Bowel fistula	6
Bladder fistula	4
Small bowel prolapse (vaginal dehiscence)	4
Intestinal obstruction[a]	12
Pneumonitis	4
Abdominal wound dehiscence	2
Pulmonary embolization	2
Others	7

[a] Treated medically.

four compartments, as a prophylactic measure against major embolization.

Some type of urinary diversion must be established if the bladder has been sacrificed. Currently, a uretero-sigmoid conduit is considered the urinary diversion of choice when the total pelvic exenteration has been performed (3). The uretero-sigmoid conduit has the advantage of rapidity and ease of performance, the avoidance of a small bowel anastomosis and hyperchloremic-hypokalemic acidosis is not a problem. Both ureters are mobilized and a mucosa-to-mucosa anastomosis to the anti-mesenteric border of a 10 to 12 cm isolated segment of distal sigmoid colon is performed. The proximal end of this isolated segment is closed and the distal end is brought out as an ostium through an incision placed midway between the umbilicus and the right anterior superior iliac spine. A sigmoid colostomy is then prepared in the usual manner with the ostium similarly placed in the left lower quadrant. The uretero-sigmoid conduit for urinary diversion was utilized in 49 patients who were treated with total pelvic exenteration. A uretero-ileal loop was used in the other five patients undergoing total pelvic exenteration as the urinary diversion.

Before the abdominal wound is closed, the previously prepared peritoneal flap is attached peripherally at the level of the excised levator muscles of the pelvic diaphragm with interrupted silk sutures (Fig. 3). The perineal vault lying inferior to the peritoneal flap is packed in a routine manner.

RESULTS

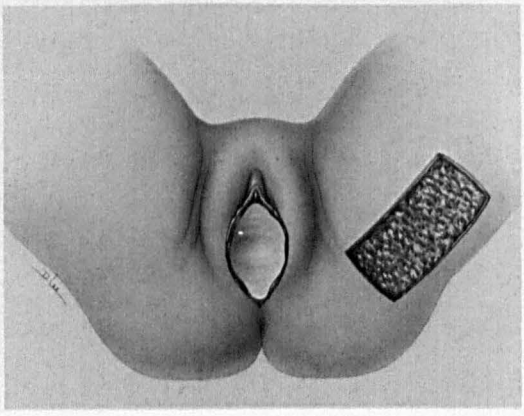
In our series of 69 patients, 25 were operated upon five or more years ago and 15 of these patients have survived and are clinically free of disease. The overall absolute 5-year survival rate is 60%. Forty-two patients were operated three or more years ago and 25 of these patients are alive and clinically free of disease. The overall absolute 3-year survival rate is also 60%. Only one of the 69 patients died during the first 30 days after the operation. In this case, uncontrollable hemorrhage resulted in renal failure and death on the 22nd postoperative day. The surgical mortality in the series reported is 1.5%. The hospital mortality is also 1.5%.

Since evidence of metastatic disease in the regional lymph nodes affords a very guarded prognosis, the results in such cases are of particular importance. In our group of 47 patients treated 2 or more years ago, eight had lymph node involvement and all of these patients have died; whereas, 29 of the 39 patients without lymph node involvement are alive and clinically free of disease at the present time.

The ages of the patients in this series ranged from 33 to 70 years with a median of 53. The average time required for operation was 5 hours and 45 minutes and the median estimated blood loss per patient was 2 800 ml. The median length of hospital stay was 30 days.

Significant complications developed in about one-third of the cases in this series (Table II); however, specific treatment for these complications was successful in most instances. Septicemia remains the most common postoperative complication; it is usually associated with an acute urinary tract infection. In fifteen patients, further operations were necessary to correct fistulas of the bowel or bladder; to close a wound dehiscence; to improve urinary diversion or to determine whether the neoplastic disease had recurred. No urinary fistulae and only two small bowel fistulae have occurred in the last 42 patients. The two fistulae were secondary to persistent and longstanding pelvic abscess.

Fig. 4. Illustration of split-thickness skin graft taken from posterior surface of thigh and applied to granulation bed in the perineal vault as a neo-vagina.



DISCUSSION

In our institution the multi-disciplinary approach to pelvic exenteration, which includes a gynecologist and a general surgeon, has been supported. The responsibility for the conduct of the operative procedure is alternated between the gynecologist and the general surgeon. These two members of the team are present throughout all procedures and alternate as first assistant. Frequently during the procedure both members of the team work simultaneously in operating trans-vaginally and transabdominally as well as in preparation of the abdominal stomata.

Pathologists emphasize that lesions of the squamous cell variety tend to grow along the planes of least resistance and in continuity into surrounding tissues for some time before they either involve adjacent vital structures or metastasize distantly. The prime indication for pelvic exenteration, therefore, is recurrent or persistent carcinoma of the cervix both because of its overall incidence and its growth pattern. Essentially all patients with previously untreated carcinoma of the cervix, however, are not considered candidates for pelvic exenteration, irrespective of stage of disease, but are managed by more conventional means at the present time.

As stated earlier, the peritoneal flap or graft is utilized as a "diaphragm" at the level of the levator ani muscles and it divides the large denuded cavity into two compartments acting simultaneously as a floor for the intra-abdominal contents and a roof for the perineal vault which ultimately becomes a neo-vagina in those cases where plastic reconstruction is to be considered. The utilization of the peritoneal graft has decreased the postoperative morbidity significantly and we prefer this method of closure of the pelvic aperture to all other methods previously recommended (4, 5). A number of these patients have been re-operated for various reasons and to date we have not encountered a contraindication to this method of pelvic compartmentalization.

Some time later vaginal reconstruction (Fig. 4) utilizing a split-thickness skin graft is considered for those patients whose sexual rehabilitation is a matter of concern (6). Twenty patients were treated in this fashion from 3 to 6 weeks following the pelvic exenteration. Once a satisfactory granulation bed has been established in the pelvic vault and the perineal defect has decreased to the size of a normal vagina, a split-thickness skin graft usually taken from the posterior thigh region is used to "line" the defect in preparation of a neo-vagina. The operation was performed without difficulty in all instances, and in no cases was excessive bleeding a problem. Other than discomfort at the donor graft site, no serious complications were encountered in the postoperative period and the functional results have been gratifying. The postoperative rehabilitation was significantly improved for these individuals, however, not all patients subjected to exenterative therapy are candidates for vaginoplasty; for reasons of age, marital status and personal inclination.

Finally, the surgeon who embarks on a program of pelvic exenterative therapy must be ready to accept increased responsibility, not only for the significant operative risk, the critical and extensive problems of postoperative care but also for the long term rehabilitation of the patient. On the other hand, the rewards are gratifying—pelvic exenteration does afford the patient a second chance at survival and those who have been cured are able to lead active and rewarding lives.

REFERENCES

1. Bernard, H. R. & Cole, W. R.: The prophylaxis of surgical infection: The effect of prophylactic antimicrobial drugs on the incidence of infection following potentially contaminated operations. Surgery *56:* 151, 1964.
2. Morley, G. W. & Lindenauer, S. M.: Peritoneal graft in total pelvic exenteration. Amer J Obstet Gynecol *110:* 696, 1971.
3. Lindenauer, S. M., Cerny, J. C. & Morley, G. W.: Ureterosigmoid conduit urinary diversion. Surgery *75:* 705–714, 1974.
4. Valle, G. & Farraris, G.: Use of omentum to contain the intestines in pelvic exenteration. Obstet Gynecol *33:* 772, 1969.
5. Mattingly, R. F.: Total pelvic evisceration. Clin Obstet Gynecol *8:* 705, 1965.
6. Morley, G. W., Lindenauer, S. M. & Youngs, D.: Vaginal reconstruction following pelvic exenteration: surgical and psychological considerations. Amer J Obstet Gynecol *116:* 996, 1973.

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