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Pelvic Exenteration

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✔ Pelvik ekzenterasyon komşu organlara yayılım gösteren bazı jinekolojik ve kolorektal tümorlerde önerilen bir ameliyat yöntemidir. Bu makalede pelvik ekzenterasyon için hasta seçimi, ameliyat öncesi hazırlık, pelvik ekzenterasyon endikasyonları, kontrendikasyonları, ameliyat tekniği, ameliyat sonrası yaşam oranları, güncel literatür incelenerek gözden geçirildi.

Anahtar Kelimeler: Pelvik Ekzenterasyon

✔ Pelvic exenteration is advocated for some of the gynecological and colorectal tumors if which are extended into neighboring tissues end organs. In this text the selection of patients, indications, contrindications and the operative techniques together with the survival rates are discussed in relation with the pertinent literature.

Key words: Pelvic Exenteration.

Pelvic exenteration was first reported by Brunswick in 1948, and it continues to be the only realistic hope for cure in women with recurrent cervical cancer previously treated with radiation therapy, occasionally indicated as a primary procedure for carcinoma of cervix with extension into the bladder but not pelvic side wall, for carcinoma of vulva which extends up the vagina and into tha rectum or bladder[1-3]. Starting with the publication of Sugarbaker, many authors strongly urged agressive radical surgery in appropriatily selected individuals with involvement of contigiouns organs. Confirmation of the validity of extended multivisceral resections has subsequently been provided by numerous investigators. Since then its risks, benefits and overall survival have been examined. Total pelvic exenteration is also performed for bulky locally advanced rectal carcinoma and involves the enblock removel of the distal sigmoid colon and rectum together with the accompanying organs and tissues of pelvis[4].

In the beginning significant morbidity and mortality in the range of 50% to 70% was encountered, but over the time these have decreased dramatically, thus providing an increased survival for those afflicted. The results of ultraradical pelvic surgery have been improved by a number of advances. Progrees has been made through the control of infection, improved aneshetic techniques, parenteral nutrition, and intensive care facilities provided by the entire medical team assigned to the service. It is well recognized thet pelvic exenteration is indeed a formiteble procedure, but now that there is greater than 50% 5 year survival and a marked decrease in mortality, this procedure has gained wide acceptance in minds of both patients and referring pysicians[2].

Total pelvic exenteration includes removal of the genital organs (vagina, uterus, tubes and ovaries) as well as bladder and rectum. Incurrent practive and isolated egment of bowel provides for a urinary reservoir, whether it be a segment of a small or large bowel. In selected cases, the procedure

may be limited to either an anterior exenteration with the removal of the bladder and praservation of the rectosigmoid, or a posterior exenteration with removal of the rectosigmoid and preservation of the bladder [2,3].

PATIENTS SELECTION

While pelvic examination plays a key role in the preoperative assesment of the individual patient, the examiner's impression of resectability must be tempered by the knowledge that errors are common. A small central lesion with freely mobile parametria reliably demonstrates resectability, however, immobility can be due to radiation fibrosis and/or pelvic inflamatory disease. Consequently, even when the disease seems inoperable on pelvic examination, if other factors are favorable one should proceed with investigations and exploratory laparatomy to avoid the error of a premature decision[3].

Tumors of rectum generally invades the adjacent organs in the pelvis. However adherence may occur anywhere in the small intestine from a primary carcinoma anywhere in the colon. Incasion of the bladder is commonly observed with carcinoma of the sigmoid colon, less frequently the rectum is the site of origin. Women are less frequently affected, presumably because of the protective effect of the uterus and adnexa. Uterine and adnexial invasion is an another frequent pattern of spread to contiguous organs. The sigmoid colon is the most common site of origin. Removal of the uterus and posterior vaginal wall (posterior exenteration) becomes necessary when invasion of rectal carcinoma is suspected[4].

Total pelvic exenteration is usually performed for bulky locally advanced rectal carcinoma. Patient selection is crucial to the success of this extended operation for rectal carcinoma and the criteria for selection have been outlined by Deckers et al[5]. Any evidence of diease detected outside the pelvis is an absolute contraindication of this procedure. The computed tomography (CT) scan is excellent in that it provides simultaneous evaluation of the liver, retroperitoneal lymph nodes, and urinary tract and allows for better evaluation of side wall involvement by the tumor in the pelvis[6]. A chest x-ray film is an another important evaluation technique for distant metastasis. Evaluation of renal function and the urinary tract is essential. Some investigators have suggested that the presence of a hydroureter is a relative contraindication to surgery[7]. Others, have noted that in the absence of other poor prognostic signs like pelvic sidewall fixation, leg edema, bulky lesions or pain, obstruction of a ureter is not a contraindication to this surgery[6,8]. The function of a obsructed kidney must be evaluadet before surgery by obtaining a renal scan[1].

The best results from pelvic exenterative surgery are achieved in patients who have a recurrent squamous cell carcinoma of the cervix or vagina. This therapy may be appropriate for advarced vulvar cancer when prior therapy has failed[2]. Extensive enbloc resection or pelvic exenteration for colorectal cancer is most suitable for locally invasive tumor of which gross systemic dissemination seems unlikely[4]. Extrapelvic disease, tumor related pelvic side wall fixation, severe medical illness, bilateral ureteral obstruction, triad of unilateral leg edema, sciatica and ureteral obstruction are the absolute contraindications of pelvic exenteration[1-3] (Table 1).

Table-I: Preoperative Contraindications to Pelvic Exenteration

Absolute

1) Exrapelvic disase
2) Triad of unilateral leg edema, sciatica and ureteral obstruction
3) Tumor related pelvic side wall fixation
4) Bilateral ureteral obstruction (if secondary to recurrence)
5) Severe life-limiting medical illness
6) Psychosis or the inability of the pa tient to care for herself
7) Religious or other belienfs that prohibit the patient from accepting transfusions
8) Inabilitiy of physicians or consultants to manage any or all intraoperative and postoperative complications.
9) Inadequate hospitel facilities.

Relative

1) Age over 70 years
2) Large tumor volume
3) Unilateral ureteral obstruction
4) Metastasis to the distal vagina

(From Partridge EE: Pelvic Exenteration. In: Sciarra J. Droergemueller W, editors. Sciarra Obstetrics and Gynecology. Philadelphia: Lippincott Company, 1991:, 1-7, Vol 4, Chapter 10)

PREOPERATIVE PREPERATION

Patients are admitted preoperatively about two days before surgery for a full bowel preperation[2]. Orr and colleagues[9] have reported a reduction in risk of wound and pelvic infection by as much as 50% in those women who had bowel preperation before extensive surgery. Arterial blood gas determinotions and pulmonary function studies should be considered in all patients. These data can serve as a baseline for management of postoperative pulmonary complications. A central venous catheter should be placed before surgery or during the operation[1,2]. Anticoagulation must be made in the preoperative period to reduce the possibility of a pulmonary embolus. This can be accomplished by prophylactic low-dose heparin therapy[1].

The patient is prepared for surgery, using the "ski position" which constitutes a modified ski position. This position allows simultaneous access to the abdominal and perineal area[2].

THE OPERATION

Pelvic exenteration consists of three components: determination of resectability, recestion and recontsruction. Determination of resectability includes inspection and palpation for intraperitoneal disease, evaluation of nodal status, and determination of the presence or absence of side wall fixation. Evidence of disease on any peritoneal surfaces or metastatic disease to the periaortic nodes in an absolute contraindication to surgery[1]. Rutledge and colleagues[10] reported a survival of only 7% in patients with positive pelvic nodes. Morley and coworkers[11] report 0% five year survival in patients with positive regional nodes and therefore, believe that they are contraindications to exenteration.

By opening the paravesical and pararectal spaces and using a Tru-Cut needle biopsy pelvis sidewall fixation should be evaluated and if found, exenteration is not performed[1]. Shingleton and colleagues[6] reported 0% two years survival in patients who undervent exenteration in the presence of sidewall fixation. After resection of the tumor, attention must then be given to re-

construction. This includes construction of a urinary coonduit, covering of the denuded pelvic floor, reconstruction of the vagina, and appropriate reanastomosis of the colon and rectum[1].

Orr[9] has shown a significant reduction in urinary leaks and gastrointestinal complications with transverse colon conduits and this is now the segment of bowel most often used at many institutions[12,1].

The denuded raw pelvic floor must be covered. Optimal closure of pelvis is probably done with techniques that bring in a new bood supply. The transposition of an omental pedicle is an excellent source meeting this criteria and has been associated with a decreased rate of major small bowel complications[1,13]. Berek[14] reported another method of closure of pelvic floor. There are numerous methods described for vaginal reconstuction following pelvic exenteration (Table 2)[1] The myocutaneous graft approach is most suitable in this regard. This approach will also help minimize the risk of bowel obstruction and enteroperineal fistula formetion by covering the pelvic floor with uninfected and well vascularized tissue[3].

In patiens who have undergone total pelvic exenteration, consideration should be given to reanastomosis of the colon and rectum. The development of the end-to-end circular stapling device has allowed the anastomosis of the colon to as little as 3 to 4 cm of rectal stump[1] . Berek and colleagues[14] have reported good results with this technique but recommend a diverting colostomy in previously irradiated paients. Hatch and associates[15] noted that most leaks were posterior and belived that it was important to cover this area with the omentum.

Table-II: Methods Described for Vaginal Reconstruction Following Exenteration

1) Spontaneous epithelization
2) Split-thickness skin grafts
3) Sigmoid vaginostomy
4) Vulvovaginostomy
5) Ileal vagina
6) Myocutaneous flaps
  a) Thight pedicle
  b) Gluteal pedicle
  c) Vulvobulbocavernosus
7) Amnion grafts

(From Patridge EE: Pelvic Exenteration. In Sciarra J, Droegemueller W, editors. Sciarra Obstetrics and Gynecology.Philadelpnhia:LippincottCompany, 1991:, 1-7, Vol 4, Chapter 10).

MORBIDITY AND MORTALITY

The morbidity and mortality directly reated to exenteration occur with in the first 18 months following the procedure. Many of the complications can be sequelae to any major surgery. These include cardiopulmonary catastrophes such as pulmonary embolism, pulmonary edema, myocardial infarction, and cerebrovascular accidents. This category of complications usually occurs within the first week after the procedure. Then there is a period when sepsis is the greatest threat to the patient's health and life. This sepsis usually originates in the pelvic cavity with occurence of a pelvic abscess or diffuse pelvic cellulitis[16] .

Among the most serious delayed postoperative complications following exenteration are those related to the denuded pelvic floor, including small bowel obstruction and enteroperineal fistulas. The risk of bowel obstruction is increased by pelvic in-

fection and both conditions predispose to the development of small bowell fistulas which always require reoperation[3] . The long-term morbidity from exenteration is predominantly related to urinary diversion. Once the period of susceptibility to sepsis has passed, urinary obstruction and infection become the major nonneoplastic life-threatening complications. Many believe that these patients should be managed with long-term urinary antisepsis, perhaps for life. Pyelonephritis is common and should be treated promptly and vigorously. Periodic IVPs must be obtained to assess the collecting system for hydronephrosis. A mild degree of obstruction is frequently retained following construction of an ideal conduit, but progressive hydronephrosis will require correction to salvage renal function[3,16] .

Nevertheless, the extended procedures did not significantly affect short term results, an operative mortatily of 8.2 percent compares favorably with a 6.6 percent operative mortatily on 11655 cases of colon cancers reported by the American Colleague of Surgeons[4] .In recent years, the overall morbitily was repeatedly reported as similar to those reported in non-extended procedures. This series reported 30 percent morbidity[17] . However, it is noteworthy that postoperative complications were more serious than after usual operations and often directly related to additional dissection. The operative mortality of multivisceral resection is within anticipated range for complex oncologic surgery. A consensus exists that the mortality rate as a result of this operation has progressively declined in the last two decades because of improvements in perioperative care[18] .

SURVIVAL

The reported 5-years survival after pelvic extenteration varies widely (Table 3) depending upon th circumstances of patient selection. For instance, patients who undergo pelvic exenteration as a primary procedure have a 20% to 25% higner 5-year survival rate than patients with recurrence following irradiation[3] . In the series from the MD Anderson Hospitel, the 2-year survival rate after exenteration was 47% for patients with pain or leg edema and resectable tumors, 73% for those who were symptom free at the time of operation, 59% for patients with a normal intravenous pyelogram prior to laparatomy, and only 34% for those with preoperative evidence of ureteral obstruction or fistula. Of those patients who recurred within 2 years of primery treatment, 46% survived 2 years, compared with a 2-year survival of 61% in those who recurred 5-years or more after treatment[10] .

Radical surgery remains the main stay of treatment for cure of locally advanced colorectal carcinoma. Although locally advanced disease is most often associated with extensive regional metastases, a well-recognized group of tumors exists that remain localized and that invade adjacent tissues before metastases occur. At this stage a properly executed operation may be curative, recognising that in certain instances, these efforts will be only palliative. The decision to include adjacent viscera during colorectal surgery must be anticipated in every abdominal exploratory surgery.

The excision of adjacent organs, whether or not they are microscopically involved by tumor, is necessary to avoid leaving potentially curable disease. Indeed, the ratio of tumor adhesions in multivisceral resection specimens varies widely and averages aproximately 1:1 in Eisengers's series [19] tumor infitration into adjecant tissues

Table-III: Pelvic Exenteration Survital Rates

Author	Institution	Number of patients treated	Number of operative deaths	Number surviving 5 years
Douglas and Sweeney	(1957) New York Hosptal	23	1(4.3%)	5(22%)
Parsons and Friedell	(1964) Harvard University	112	24(21.4%)	24(21.4%)
Brunschwing	(1965) Memorial Hospital	535	86(15%)	108(20.1%)
Bricker	(1967) Washington University	153	15(10%)	53(34.5%)
Krieger and Embree	(1969) Cleveland Clinics	35	4(11%)	13 (3%)
Ketcham et al.	(1970) National Cancer Institude	162	12(7.4%)	62(38.2%)
Symmonds et al.	(1975) Mayo Clinic	198	16(8%)	64(32.3%)
Morley and Lindenauer	(1976) University of Michigan	34	1(2.9%)	21(62%)
Rutledge et al.	(1977) M.D. ANderson Hospital	296	40(13.5%)	99(33.4%)
Averette et al.	(1984) University of Miami			
	1966-1971	14	4(28.8%)	5(36%)
	1971-1976	45	15 (33.3%	10(22%)
	1976-1981	33	4(10.4%)	19(58%)
Lawhead et al.	(1989) Memorial Hospital 1972-1981	65	6(9.2%)	15(25%)
Soper et al.	(1989) Duke University	69	5(7.2%)	28(40.5%)
Shingleton et al.	(1989) University of Alabama	143	9(6.3%)	71(50%)
TOTAL		1917	242(12.6%)	647(34%)

(From Disaia PJ, Creasman WT. Invasive Cervical Cancer. In: Disaisa PJ, Creasman WT, editors. Clinical Gynecologic Oncology. St. Louis: Mosby Year Book, 1993:, 58-125.)

was proved in 84% of patients. In colorectal carcinoma patients with microscopically confirmed involvement of adjacent organs have a poorer pragnosis[4] . Heslov and Frost[20] reported that 50% of patients with stage B3 lesions with histologic invasion by tumor were cured compered with 72% of patients without invasion by tumor. Smilarly, the 5-years survival rate was zero for patients with stage C 3 lesions with confirmed extension of tumor composed with a survival rate of 60% without extension of tumor. Lymph node involvement by tumor is the primary determinant of long term survival with involvement of contiguous organs, histologic demonstration of direct extension of tumor is an additional prognostic variable[4,19] .After presumed curative resection, local recurrence is the most common cause of failure in patients with stages B 3, C 2 and C 3 lesions of colorectal carcinoma[4,17] . This observation again stresses the need for aggressive en bloc resection and lymphadenectomy for lesions involving adjacent structures. The widely quoted paper of Sugarbaker reported a 3 year survival rate of 45% for patients who had multivisceral resections performad during colo-

rectal surgerl[19] . Corresponding figures are slightly better in reports in the literature over the last 15 years, yielding an average 5-year sulvival rate of 38%[20-22] .

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