

PELVIC EXENTERATION – RESULTS FROM A SINGLE INSTITUTION

MIHAI CĂPÎLNA^{1*}, BOGDAN MOLDOVAN², BELA SZABO¹,
EDUARD CRAUCIUC³, OVIDIU TOMA⁴, DRAGOȘ CRAUCIUC³

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Abstract. Analyse the initial experience of pelvic exenteration for gynaecological malignancies in a tertiary referral center. **Material and method.** Between 2011 and 2013, 15 patients underwent a pelvic exenteration for gynaecological malignancies. **Results.** Out of the 15 exenterations, 6 were total, 4 anterior and 5 posterior. The indication was cervical (9 patients), advanced vaginal (1 patient) and ovarian cancer (in 5 patients). A Bricker non-continent ileal urinary conduit was performed in all 10 anterior and total exenterations. In-hospital complications occurred in 6 patients (40%) of whom two perioperative deaths (13%). Among the 15 patients, at this moment, 8 are alive; 6 are dead because of the disease, and one is lost to follow-up. **Conclusion.** Pelvic exenteration for recurrent or advanced pelvic malignancies can be associated with long-term survival and even cure without high perioperative mortality in properly selected patients. However, postoperative complications are common and can be lethal.

INTRODUCTION

After initially published by Alexander Brunschwig in 1948 (1) with a palliative intent and described as “the most radical surgical attack against the pelvic cancer”, the pelvic exenteration became an ultimate, salvage therapy for patients with advanced or recurrent pelvic cancers. It is considered an extremely difficult and demanding procedure for both surgeon and anaesthesiologist, with an intra- and perioperative mortality between 0 and 9% (2-12), but, if succeeded, for those patients without other alternative curative option, the five-years survival rate ranges between 20 and 60% (2-13).

The main indications are the central pelvic recurrences after gynaecologic, urologic or rectal cancers. In later years, the indications have expanded to include also lateral recurrences involving the pelvic side wall when resection with clear margins is achievable, making it possible to offer salvage therapy to selected patients previously regarded to be incurable (14). Occasionally, pelvic exenteration is performed as primary treatment for advanced pelvic malignancies with the intent of excising the malignancy en bloc (15), as well as for palliation in patients with severe symptoms, like intense pelvic pain, bleeding difficult to control, fistulas or grossly changes of local anatomy, where no other treatment options exist.

Pelvic exenterations may be total (removal of urinary bladder, rectum, vagina, tumour), anterior (urinary bladder, vagina, tumour) or posterior (rectum, vagina, tumour). In all 3 situations, it is mandatory to remove the uterus and the adnexae, if not previously removed. An anterior exenteration generates the need for a urinary diversion, which can be incontinent or continent. Also, the continent urinary diversion may be heterotopic, when the reservoir is placed under the abdominal wall and the patient has to catheterize herself, or orthotopic, when the new reservoir is placed in the pelvis and the patient voids through her preserved urethra (13, 16, 17). The procedure can be classified also as supraleatory, infraleatory or infraleatory with vulvectomy (3) depending on the resection lines in relation to the levator ani muscles. An infraleatory excision including the removal of the anal canal requires a permanent colostomy, and a total colectomy requires the creation of a neo-vagina for the patients who desire to maintain their sexual function (13).

The objective of this study was to review our pelvic exenteration initial experience for patients with gynaecologic cancers, in terms of patient selection, indications, surgical technique and complications.

MATERIALS AND METHODS

Between August 2011 and September 2013, 15 patients were submitted for a pelvic exenteration in the First Clinic of Obstetrics and Gynaecology, University of Medicine and Pharmacy Târgu-Mureș, Romania. This procedure was initially considered feasible in 18 patients, but it succeeded only in 15. Even when complete tumour resection was assessed as possible after preoperative staging, the surgical procedure was abandoned in 3 patients. In 2 patients the tumour was found impossible to be removed because of sidewall involvement with extension to the bony structure or tumour involving the neurovascular structures of the sciatic foramen (especially the first sacral plexus root), and in one patient, multiple metastases have been discovered in the omentum and peritoneum. Patients' age ranged between 36 and 73. All the procedures were considered with a curative intent. The preoperative assesment included mandatory a CT or IRM, for exclusion of extrapelvic disease and evaluation of operability. All patients proposed for a total or anterior exenteration

underwent cystoscopy, and for a total or posterior exenteration a colonoscopy. Two patients with cervical cancer stage IVa (bladder mucosa involvement and unilateral hydronephrosis) decided for primary anterior exenteration as treatment and refused radiochemotherapy, when they asked for the treatment options. One patient with a stage IVa vaginal cancer was treated 19 years before with surgery and radiotherapy for a cervical cancer.

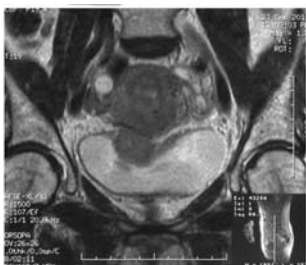


Fig. 1. IRM scan of a stage IVa cervical cancer with bladder invasion and unilateral hydronephrosis

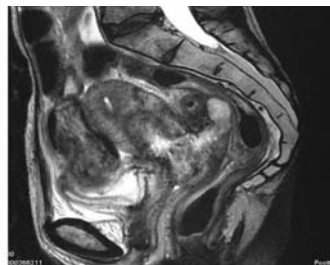


Fig. 2. IRM scan of a huge cervical tumour (stage IVa cervical cancer) invading the bladder and rectum and compressing the rectal lumen against the sacrum

Also, in two patients with pelvic advanced ovarian cancer, we considered as posterior exenteration en-bloc removal of uterus, adnexae, recto-sigmoid junction together with the tumours of the pouch of Douglas, the procedure necessitating a retroperitoneal and pelvic side-wall dissection. All the other cases were exenterations performed for recurrent or persistent cervical cancer after radiochemotherapy or for central pelvic recurrent ovarian cancer. We did not consider mandatory to obtain a histopathologic confirmation of all recurrences or persistent cervical cancers when the clinical or imaging were doubtful. In all cases when, during the procedure, a complete resection was considered impossible with macroscopically no residual tumour (R0), the surgery was abandoned. A detailed informed consent was obtained for each patient before surgery. Complications were divided as early (<30 days) or late (>30 days). For each patient, only the highest complication was recorded when a complication clearly occurred as a consequence of a prior complication of a lower grade

RESULTS AND DISCUSSION

Out of the 15 exenterations, 6 were total, 4 anterior and 5 posterior. The indication was recurrent (for 7 patients) or advanced (for 2) cervical cancer, vaginal (for 1) and ovarian cancer (in 5 patients). All 10 total or anterior exenteration underwent a urinary diversion by Bricker ileal non-continent conduit (18), because we considered it technically easier and with less complications. In 8 patients, the ileo-ureteral anastomosis was made separately for both ureters, and in 2 through a common ureteral plate (Wallace technique), depending of ureters diameter and vascularization.



Fig. 3. Total infralevatorian exenteration with vulvectomy. The entire perineum was removed. A tissue sponge is placed into the pelvis.

Out of 11 cases in which it has been performed a total or posterior exenteration, six patients required a definitive end-colostomy, and five a low rectal anastomosis (performed by manually suturing in 3 and by circular stapler in 2). A supralevatorian exenteration was performed in 11

cases, but, in 4 patients, we performed an infralevatorian exenteration with vulvectomy (all total for recurrent or persistent cervical cancer with vaginal involvement or for vaginal cancer) for a better oncologic radicality. All patients required blood and plasma transfusion, total parenteral nutrition, and prophylactic antibiotic treatment.

In our series, we did not experienced intraoperative death but, as early complications, unfortunately, two patients died before 30th postoperative day. A young 36 years old woman, para 3, referred to our hospital in a general poor condition, with a subocclusive syndrome caused by a huge cervical tumour invading the rectal wall and compressing the rectal lumen against the sacrum, developed in the 4th day after a total supralelevatorian exenteration, a caecal perforation with general peritonitis, which was fatal, despite re-operation and intensive care support. The second death was registered in a 67 old patient with a myocardial infarction 12 months before the surgery, with a surgical uneventful recovery after a total exenteration, who developed suddenly in the 10th postoperative day an acute pulmonary oedema with cardiac failure. Other severe early complication was an entero-perineal fistula developed on the 16th day following a total infralevatorian exenteration with vulvectomy, which necessitated re-laparotomy and enteric suturing.



Figure 4. Intraoperative aspect after an infralevatorian total exenteration with vulvectomy. Both ureters, internal iliac arteries and veins were ligated. A drain is placed through the perineal wound.

Other early minor complications included a urinary conduit leakage which solved spontaneously and a prolonged paralytic ileus, solved by drug therapy. As late complications, we encountered a stenosis of the uretero-ileal anastomosis, which underwent finally a unilateral permanent nephrostomy.

Among the 15 patients, at this moment, 8 are alive with no evidence of disease; 6 are dead because of the disease, and one is lost to follow-up. This data are not conclusive for survival, because the follow up period is too short for all the patients. All these data are summarized in table 1.

Table 1. Oncologic indications, type of exenteration, early and late complications for the 15 patients who suffered a pelvic exenteration

Date	Name	Age	Indication	Type	Type levator ani	Early complications	Late complications	Patients' status
28.04.11	O.R.	73	Ovary recurrent	Post	Supralelevatorian	No	No	Deceased
03.05.11	T.E.	66	Ovary recurrent	Post	Supralelevatorian	Paralytic Ileus	No	Deceased

Date	Name	Age	Indication	Type	Type levator ani	Early complications	Late complications	Patients' status
15.08.11	A.M.	46	Cervix recurrent	Ant	Suprlevatorian	No	Uretero-ileal anastomosis stenosis	Deceased
02.11.11	S.P.	58	Cervix stage IVa	Ant	Suprlevatorian	No	No	Alive free of disease
24.11.11	E.A.	48	Ovary stage IV	Post	Suprlevatorian	No	No	Alive free of disease
27.01.12	S.N.I.	36	Cervix persistent	Total	Suprlevatorian	Peritonitis from caecum perforation		Deceased <30 days
28.05.12	C.M.	65	Ovary recurrent	Post	Suprlevatorian	No	No	Alive free of disease
25.06.12	M.M.	54	Cervix persistent	Total	Suprlevatorian	Pneumonia	No	Lost to follow-up
22.10.12	K.J.	48	Cervix stage IVa	Ant	Suprlevatorian	No	No	Alive free of disease
16.01.13	T.A.	46	Ovary stage IV	Post	Suprlevatorian	No	No	Alive free of disease
08.03.13	S.G.	46	Cervix recurrent	Total	Infralevatorian with Vulvectomy	Bricker ileal conduit leakage	No	Alive free of disease
21.06.13	A.D.	63	Cervix persistent	Total	Infralevatorian with Vulvectomy	Entero-perineal fistula; acute renal failure	Blocked evisceration.	Deceased
02.08.13	G.M.	67	Cervix persistent	Total	Infralevatorian with Vulvectomy	Acute pulmonary oedema	No	Deceased <30 days
09.09.13	B. L.	49	Vaginal IVa	Total	Infralevatorian with Vulvectomy	No	No	Alive free of disease
27.09.13	C. A.	53	Cervix recurrent	Total	Suprlevatorian	No	No	Alive free of disease

Analyzing the results of pelvic exenteration series, it must be kept in mind that this procedure remains the only option, the only potentially curative treatment for these patients with recurrent or advanced pelvic malignancy. Even when it exists a tendency to push forward the indications, the medical (poor general conditions or all other illness causing problems for a long and difficult surgical procedure and recovery) and surgical-oncologic contraindications, like extrapelvic metastases (exception – isolated hepatic or pulmonary one), distance lymph nodes metastases (inclusive para-aortal), sidewall involvement with extension to the bony structures of the pelvis or tumour involving the neurovascular structures of the sciatic foramen, must be respected. Anyway, considerable differences exist about indications and contraindications for exenteration within and between countries.

The mainstay for treatment success in terms of locoregional control and long-term survival is resection of the pelvic tumour with clear margins (14,16,19). In our series, the procedure was abandoned in 3 patients when complete tumour removal was considered impossible. Margin status appears to be the factor most consistently associated with prognosis (14, 19). Pelvic sidewall involvement was previously considered a contraindication for exenterations with

curative intent (14, 20), but since then, studies have shown equal results as for central recurrences when a complete resection can be performed (14, 19, 21-23). However, resections including pelvic side wall are technically demanding and may be associated with increased risks. Patients considered for exenterations with curative intent should be properly selected based on thorough clinical and imaging assessment to minimize the risk of performing resections with involved margins or to abandon the procedure based on intraoperative findings.

Perioperative mortality in more recent studies ranges between 0% and 9% (5-9, 14). In our initial series, we had 2 deaths in the first 30 days after the surgery in 15 patients - a higher perioperative mortality of 13%. Our department is the first gynaecological one in Romania, a country with an extremely high incidence of cervical cancer, to perform such hyper-radical procedures. These are our initial results; probably, by getting more experience in all the steps already mentioned, the morbidity and mortality related to pelvic exenteration will decrease and the survival will be better.

Introducing exenteration is paramount for a group of cases. It is a complicated procedure, needs special training, surgical devices (as staplers, vessel sealing devices, etc), and special postoperative care. Introducing this procedure has a learning curve, and thus an initial relative risk. It seems that this experience (with acceptable morbidity and mortality rate) might encourage other services to start using exenterative procedures. For sure, an international experience is needed in teaching and learning complicated and infrequent surgical procedures. Aiming to obtain maximum results in terms of patients cure and survival, clear protocols must be established for all the steps to be followed in the management of such a case: patient selection, preoperative assessment, surgical procedure, intensive care support, and recovery period.

The major limitations of this report are the retrospective nature of the study, the small number of patients included, the limited follow-up period, and the heterogeneity of diagnoses for which the exenterations were performed. These drawbacks restricted a statistical analysis, and major conclusions should be drawn with cause.

Overall, pelvic exenteration for recurrent or advanced pelvic malignancies can be associated with long-term survival and even cure without high perioperative mortality in properly selected patients (24). New devices, such as the harmonic scalpel, new vessel sealants, and mechanical staplers have diminished the operative time dramatically, increasing the safety of the vascular ligatures at the same time. However, postoperative complications are common and can be lethal. Complete surgical resection with negative margins is associated with sustained survival and should be the goal of surgery. An international experience is needed in teaching and learning complicated and infrequent surgical procedures.

CONCLUSIONS

Pelvic exenteration for recurrent or advanced pelvic malignancies can be associated with long-term survival and even cure without high perioperative mortality in properly selected patients. However, postoperative complications are common and can be lethal.

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¹ University of Medicine and Pharmacy Târgu-Mureş, Romania, First Clinic of Obstetrics and Gynecology

² "Sf. Constantin" Hospital Braşov, Romania

³ "Gr.T.Popa" University of Medicine and Pharmacy, Iasi, Romania, „Elena Doamna” Iaşi Clinical Hospital

⁴ "Alexandru Ioan Cuza" University, Iasi, Romania

* mcapilna@gmail.com