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Multivisceral cytoreductive surgery in FIGO stages IIIC and IV epithelial ovarian cancer: Results and 5-year follow-up

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Abstract

Objective. The present study reviews our 5-year results with extensive, multivisceral cytoreduction in patients with FIGO stages IIIC and IV ovarian cancer.

Methods. During the five-year period from January 1995 to December 1999, 101 patients with primary epithelial ovarian cancer FIGO stages IIIC and IV had extensive multivisceral cytoreductive surgery at our department. Patients' history, surgery data, staging, recurrence and survival data were abstracted from the patients' records.

Results. Eighty-four (83%) patients had no gross residual disease after the complete surgical procedure. Mean follow-up was 46 months (range, 1–130). Eight patients died within 6 months postoperatively. Seventy-six of our one hundred one patients (75%) had disease progression or recurrence after a mean of 28 months (range, 4–110). Seventeen (17%) patients are alive without disease. Median survival was 47 months and five-year survival was 33% for all 101 patients.

Conclusion. This series indicates that in the majority of patients with advanced ovarian cancer, primary surgery can lead to complete gross cytoreduction with substantial subsequent rates of disease-free and overall survival.

Keywords: Ovarian cancer; Cytoreductive surgery; Multivisceral cytoreductive surgery; Primary surgery; Interval debulking surgery

Introduction

Ovarian cancer continues to be one of the major causes of death from cancer among women in the western world [1]. The majority of patients present with stage III or IV disease and the advanced stage of disease at the time of diagnosis is the main factor contributing to the overall poor prognosis. The concept of cytoreductive surgery in ovarian cancer dates back to the work of Munnell [2] and Griffiths et al. [3,4] who were the first to demonstrate that the success of subsequent chemotherapy in advanced disease is significantly affected by the extent of cytoreductive surgery. Numerous subsequent studies have confirmed the benefits on survival of extensive cytoreduction at primary surgery for both stage III and stage IV disease [4–7].

The present study reviews our 5-year results with extensive, multivisceral cytoreduction in patients with FIGO stages IIIC and IV ovarian cancer.

Materials and methods

During the five-year period from January 1995 to December 1999, 101 patients with primary epithelial ovarian cancer FIGO stages IIIC and IV had cytoreductive surgery at our department. During the study period, only two patients did not undergo surgery because of disease extent.

All patients were operated by one of four gynecologic surgeons. The aim of the surgery was a maximum cytoreduction. Standard procedure was a modified posterior exenteration, i.e. a retroperitoneal exstirpation of uterus, adnexe, rectosigmoid bowel and pelvic peritoneum en bloc [8], infragastric total omentectomy, a complete peritonectomy of the middle and upper abdomen including the complete diaphragm [9] and a systematic pelvic and paraaortic lymphadenectomy. In addition we tried to remove all tumor-infiltrated tissue thus necessitating partial resection of small bowel, large bowel, liver, pancreas, urinary bladder and diaphragm. Further procedures included splenectomy, cholecystectomy and resection of the renal capsule.

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"Primary surgery" was defined as surgery for those of our patients who primarily presented at our department at the time of diagnosis and had received neither previous chemotherapy nor major surgery (i.e. only laparoscopy or exploratory laparotomy) before definitive radical surgery. "Interval debulking surgery" was defined as surgery in patients who had received some incomplete tumor reductive surgery and/or chemotherapy at another hospital before surgery at our department.

Patients' history, surgery data, staging, recurrence and survival data were abstracted from the patients' records.

Statistical analysis was performed with Pearson's chi-square test, Fisher's exact test in contingency tables. For quantitative comparisons, the Student's *t*-test and the Wilcoxon test were applied. The analysis of time-to-event data in the case of survival and recurrence was done with the Kaplan–Meier estimator, the log–rank test and the Cox proportional hazard model with backward variable elimination using the Wald statistic. A p-value<0.05 was regarded as statistically significant. For correlation analysis Spearman's correlation coefficient was used. All analysis was done with SPSS 13 (SPSS Inc. Chicago, IL).

Results

The mean age of our 101 patients was 60 years (range, 31–81). Forty-eight patients (48%) had FIGO stage III and fifty-three patients (52%) had FIGO stage IV disease. Fifty-five patients (54%) had primary surgery, forty-six (46%) patients received interval debulking surgery. Forty-three of these forty-six patients had received a platinum based neoadjuvant chemotherapy, five patients had received an additional taxane based neoadjuvant chemotherapy. The mean number of cycles of neoadjuvant chemotherapy was four (range 1–11). The surgical procedures are listed in Table 1. Forty-five (82%) patients with primary surgery and thirty-nine (85%) with interval debulking surgery had no gross residual disease after the complete surgical procedure ($p=0.793$). No significant correlation between FIGO stage and postoperative abdominal residual tumor was found ($p=0.117$).

Table 1
Surgical procedures in 101 patients undergoing cytoreductive surgery for FIGO stages IIIC and IV ovarian cancer

	($n=101$) no. (%)
Modified posterior exenteration (MPE)	82 (81)
Omentectomy, infragastric	97 (96)
Lymphadenectomy pelvic/Paraaortic	88 (87)
Small bowel resection and anastomosis	9 (9)
Ileocoecal resection and anastomosis	19 (19)
Appendectomy alone	21 (21)
Large bowel resection other than MPE	7 (7)
Large bowel anastomosis (including anastomosis in MPE)	87 (86)
Peritonectomy, partial	20 (20)
Peritonectomy, complete	78 (77)
Ileostomy	0 (0)
Colostomy	3 (3)
Splenectomy	57 (56)
Cholecystectomy	22 (22)
Partial hepatectomy	11 (11)
Glisson capsule resection	39 (39)
Renal capsule resection	37 (37)
Diaphragm resection right	19 (19)
Diaphragm resection left	2 (2)
Urinary bladder resection (partial)	3 (3)
Ureter resection	0 (0)
Thoracic drain	21 (21)

Table 2
Details of surgery in 101 patients undergoing cytoreductive surgery for FIGO stages IIIC and IV ovarian cancer (55 patients had primary surgery and 46 patients had interval debulking surgery)

	Primary surgery ($n=55$) no. (%)	Interval debulking surgery ($n=46$) no. (%)	p
Duration of surgery, minutes, mean (range)	372 (160–590)	379 (195–660)	0.688
Use of red blood cell transfusions (RBCT)/Fresh frozen plasma (FFP)			
RBCT intraoperatively, mean (range)	9 (2–22)	11 (2–32)	0.047
FFP intraoperatively, mean (range)	8 (0–24)	10 (0–36)	0.094
RBCT postoperatively, mean (range)	2 (0–9)	4 (0–22)	0.044
FFP postoperatively, mean (range)	3 (0–20)	3 (0–26)	0.372
Surgery-associated mortality			0.137
Intraoperatively	0 (0)	0 (0)	
Postoperatively within 28 days	0 (0)	0 (0)	
Postoperatively within 6 months	2 (4)	6 (13)	
Reoperation	5 (9)	14 (30)	0.010
Leakage of anastomosis	2 (4)	5 (11)	
Removal of tamponade	0 (0)	4 (9)	
Bleeding/Hematoma	1 (2)	3 (7)	
Bowel leakage	1 (2)	1 (2)	
Lymphocyst	0 (0)	1 (2)	
Stomach lesion	1 (1)	0 (0)	
Duration of hospitalization, days, mean (range)	35 (13–73)	40 (19–120)	0.107

Mean duration of surgery was 375 min (range, 160–660). All 101 patients received intraoperatively red blood cell transfusions (RBCT) and 94 (93%) fresh frozen plasma (FFP) (Table 2). Eighty-four (82%) postoperatively received RBCT and 65 (64%) FFP (Table 2). A mean of 25 pelvic lymph nodes (range 4–77) was removed in 83 patients and a mean of 19 paraaortic lymph nodes (range 1–65) in 86 patients. In patients with gross residual disease, no systematic lymphadenectomy was performed. Thirty-seven (37%) of our patients had pelvic and paraaortic lymph node involvement, ten (10%) had pelvic involvement alone without paraaortic involvement and seventeen (17%) had paraaortic involvement alone without pelvic involvement. Postoperatively, thirty-one patients (31%) had lymphocysts requiring drainage and one (1%) had a lymphocyst requiring revision. Thirteen patients (13%) had a thromboembolic event. No patient died within 28 days of surgery. Eight patients died within 6 months postoperatively (Table 2). The mean duration of hospitalization including the first cycle of chemotherapy postoperatively was 37 days (range 13–120). Duration of hospitalization was significantly associated with duration of surgery ($p=0.002$) and with the amount of the intraoperatively applied red blood cell transfusions ($p<0.001$).