

Possible role of palliative surgery for bowel obstruction in advanced ovarian cancer patients

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Summary

Objectives: Bowel obstruction is a relatively common event (30-40%) in advanced or recurrent ovarian cancer patients. No definitive data are available on the optimal management of this serious complication and treatment is generally limited to adoption of palliative measures. These modalities include both surgical and medical procedures. The aim of this study was to define selection criteria for subjects who would benefit from palliative surgery. **Study design:** Out of 270 epithelial ovarian cancer patients treated in the period 1984-2005, 75 (28%) developed bowel obstruction related to progression/recurrence of the disease. Palliative treatment – both medical and surgical – was applied on an individual basis. A new score developed by these authors was retrospectively applied to this group of patients with the aim of defining a subgroup that could benefit from surgical treatment. **Results:** Fifty cases (66.7%) were medically treated whereas 25 patients (33.3%) underwent surgery. Mean and median survival rates were 34 and 28 weeks in the surgical group versus 12 and four weeks in the medical group. Distribution according to score showed 53 cases (71%) in the low score group (< 14) and 22 (29%) in the high score group (> 14). A significantly better survival was observed in the low-score group ($p < 0.0001$) and in the surgically treated patients ($p < 0.001$). According to the risk score variables patients treated surgically for obstruction with low scores had a longer survival ($p < 0.005$) compared to medical treatment but this difference was not found in the high-risk group ($p < 0.05$). **Conclusions:** The prognosis of patients with bowel obstruction in relation to advanced ovarian cancer is best determined by comprehensive assessment of all prognostic parameters to define a subgroup of patients in a low-risk group that may benefit from surgical treatment.

Key words: Ovarian cancer; Palliative surgery; Prognostic factors.

Introduction

Bowel obstruction is a relatively common event in advanced or recurrent ovarian cancer patients. Different authors have shown an incidence of bowel obstruction of up to 30-40% in these patients [1, 2]. This serious and often life-threatening complication is mainly caused by progressive intraabdominal tumor growth leading to extrinsic occlusion of the bowel lumen, intraluminal occlusion due to pelvic, mesenteric or omental disease, and/or intestinal motility disorders due to infiltration of the mesentery or bowel muscle and nerves [2].

No definitive data are available on the optimal management of this serious complication and treatment of ovarian cancer-related bowel occlusion is still generally limited to the adoption of palliative measures.

Different modalities of treatment have been proposed in these patients, including both surgical (bypass procedures, colostomy, ileostomy, percutaneous endoscopic gastrostomy (PEG), and, rarely, bowel resection) and medical procedures (nasogastric tube decompression, intravenous fluid hydration, and drug administration) [2]. Specifically, PEG consists of the construction of a tube stoma, and it has shown to be superior to both nasogastric suction and operative gastrostomy for palliation of small bowel obstruction in terminal patients [2-4].

Significant morbidity and mortality are related to the surgical treatment of ovarian cancer related-bowel obstruction and different studies have shown major complications in 31% to 43% of these patients [3, 5-7]. Mortality rates within 30 days of surgery range from 10% to 25% [2, 8-12] and median postoperative survival ranging from 10-20 weeks [1-3, 13, 14] are reported in the scientific literature (Table 1). Although successful surgical relief of bowel obstruction can often be achieved, selection of those subjects who will benefit from palliative surgery should be carefully evaluated.

The aim of this study was to evaluate the possible clinical benefit deriving from a surgical approach in advanced ovarian cancer patients affected by cancer-related bowel obstruction.

Material and Methods

From 1984 to 2005, 270 patients with epithelial ovarian cancer were diagnosed and treated at the Department of Obstetrics and Gynecology, University of Brescia. Seventy-five (28%) cases developed bowel obstruction related to progression/recurrence of disease.

All clinical records of ovarian cancer-related bowel obstruction were retrospectively reviewed and the necessary clinical data obtained. All the histopathological sections were reviewed. All patients underwent surgery as the primary treatment. Tumor stage was assigned according to the criteria of the International Federation of Gynecology and Obstetrics (FIGO). Criteria defined by the World Health Organization (WHO) were employed for histologic diagnoses.

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Table 1. — Comparison of data in the literature and results of the present study: perioperative deaths and survival of surgically treated ovarian cancer patients with bowel obstruction.

Authors	Total patients n°	Surgically-treated Patients n°	Perioperative death n° (%)	Mean survival (weeks)
Tunca (1981)	127	90	13 (14)	28
Piver (1982)	60	49	11 (22)	10
Krebs (1983)	98	92	26 (18)	12
Clarke-P. (1987)	49	49	7 (14)	18
Redman (1988)	38	24	4 (17)	11
Rubin (1989)	52	43	9 (21)	23
Larson (1989)	33	19	3 (16)	14
Lund (1989)	41	19	8 (42)	11
Bais (1995)	31	19	0	16
Jong (1995)	53	53	?	13
Gadducci (1998)	34	22	2 (9)	17
Present study	75	25	2 (25)	34

The median age of patients was 56 years (range: 30-80 years). Four patients (5.3%) were initially diagnosed with FIGO surgical Stage I disease, 50 (67%) were Stage III, and 15 (20%) Stage IV. Six cases were referred from other institutions as advanced stage but without adequate staging procedures. The study included 50 serous carcinomas, nine mucinous, nine endometrioid, six undifferentiated and one mixed form. All 75 patients received platinum-based first-line chemotherapy.

Bowel obstruction (BO) was diagnosed on the basis of clinical symptoms and/or physical findings, and it was confirmed by a supine and upright abdominal X-ray showing dilated loops of small bowel and/or air fluid levels. A few patients (9/75, 12%) underwent other investigations such as radiographic contrast evaluation of the small and/or large intestine, abdominal computed tomography (CT) scan or ultrasound (US).

The choice of surgical or medical treatment of the BO was not based on a clinical protocol, but rather the type of therapy was individually tailored. The conservative medical approach treatment included nasogastric suction, intravenous fluid hydration, and/or drug administration, mainly consisting of hyoscine butylbromide, haloperidol, corticosteroids, somatostatin, and morphine. Parental nutrition was seldom administered in the perioperative period (3/25, 12%). The surgical treatment consisted of bowel resection and anastomosis, bypass procedures, explorative laparotomy, colostomy, ileostomy, and explorative laparotomy with resection of the tumor mass. In the group of surgically treated patients, the surgical team included a gynaecologic oncologist and a general surgeon.

An updated proposed risk score [15] was retrospectively applied to our patients to better define the characteristics of patients who could benefit from surgical treatment and to identify any possible correlation with their prognosis (Table 2).

The Pearson chi-square test was used to compare different groups of patients. Survival from relapse curves were plotted using the Kaplan-Meier method and analyzed by the log-rank test.

Results

In this study 75 advanced ovarian cancer patients experienced bowel obstruction related to their disease. The site of obstruction was the large bowel in 13 cases (17.3%), small bowel in 13 cases (17.3%), and both in the remaining 49 patients (65.4%).

Table 2. — Risk score prognostic variables in bowel obstruction.

Parameters	Risk score	Parameters	Risk score
<i>Age</i>		<i>Previous RT</i>	
< 45	0	None	0
45 - 65	1	RT to pelvis	1
> 65	2	RT to abdomen	2
<i>Free-interval (yrs)*</i>		<i>Previous CT</i>	
> 2	0	None	0
1-2	1	Single drug	1
< 1	2	Multiple drugs	2
<i>Hematocrit (%)</i>		<i>Tumor status</i>	
> 30	0	No palpable intrabdominal masses	0
25-30	1	Palpable masses	1
< 25	2	Distant metastases	2
<i>Albumin (g/dl)</i>		<i>Ascites (l)</i>	
> 3.06	0	0.1-1	0
2.55-3.06	1	1.1-3	1
< 2.55	2	> 3	2
<i>Lymphocytes (cell/mm³)</i>		<i>Site of obstruction</i>	
< 1350	0	Large bowel	0
< 1125	1	Small bowel	1
< 900	2	Both	2
<i>PSK (%)</i>		<i>Vomiting</i>	
> 80	0	No	0
60-70	1	Occasional	1
< 60	2	Persistent	2
<i>Previous operations</i>		<i>Pain</i>	
Standard	0	No	0
Others	1	Yes	2
None	2		

* From diagnosis to onset of obstruction.

Mean and median survival since obstruction was 19.6 weeks and eight weeks, respectively.

Fifty cases (66.7%) were medically treated, whereas the remaining 25 patients (33.3%) underwent surgery. In the latter group the sites of obstruction were large bowel in nine cases (36%), small bowel in seven (28%), and both in the remaining nine patients (36%).

The types of surgical procedure performed to cure bowel obstruction included: bowel resection and anastomosis in 14 cases (56%), bypass procedures in four cases (16%), explorative colostomy in one case (4%), ileostomy in another two cases (8%) and one explorative laparotomy with resection of the tumor mass (4%); three cases underwent exploratory laparotomy and were intraoperatively considered as inoperable (16%) (Table 3).

Median operative time was 180 minutes (range: 120-480 min). The peri-operative mortality rate, expressed as death within four weeks of surgery, was 8% (2/25); one patient died within a week after surgery and her death was directly related to the surgical procedure, while the second one died after three weeks because of a pulmonary complication in a different institution.

Twelve out of 25 patients submitted to surgery (48%) received further chemotherapy, whereas only six (12%) of the 50 cases that were medically treated underwent further antineoplastic treatment.

Table 3. — Surgical procedure, score and survival for surgically treated patients.

Surgical procedure	Score	Survival (weeks)
1 Ileal-cecal bypass, permanent colostomy, multiple biopsies	13	36
2 T AH, left salpingo-oophorectomy, recto-sigmoid resection, low colonic end-to-anastomosis	12	54
3 Ileal-traverse colon anastomosis	9	42
4 Ileal-traverse colon by-pass, multiple biopsies	9	6
5 I leal resection, end-to-end anastomosis	9	6
6 Recto-sigmoid resection, low colonic end-to-end anastomosis, mesenteric lymphadenectomy	4	91
7 Exploratory laparotomy (in a different institution)	9	< 1
8 Traverse colostomy	9	33
9 Exploratory laparotomy,multiple biopsies	13	20
10 Adhesionlysis, ileal resection, ileal colonic bypass, permanent colostomy	14	8
11 Adhesionlysis, resection of ileal metastasis, ileal-traverse colon anastomosis, colostomy	12	5
12 Adhesionlysis, resection of tumor mass	11	64
13 Ileal-colonic anastomosis	11	14
14 Exploratory laparotomy	16	10
15 Ileal-traverse colon anastomosis, permanent colostomy	14	11
16 Ileostomy	9	46
17 Resection of descending colon, latero-lateral anastomosis	13	11
18 Exploratory laparotomy,resection of tumor mass	11	5
19 Ileal-colonic anastomosis	17	3
20 Adhesionlysis, resection of bowel with end-to-end anastomosis	10	72
21 Omentectomy,resection of sigma, left salpingo-oophorectomy	12	56
22 Ileo-traverse colostomy	10	28
23 Ileal resection, latero-lateral anastomosis adhesionlysis	8	76
24 Ileal resection, terminal ileostomy	12	44
25 Ileal-ascending colon bypass, latero-lateral anastomosis, multiple biopsies	16	15

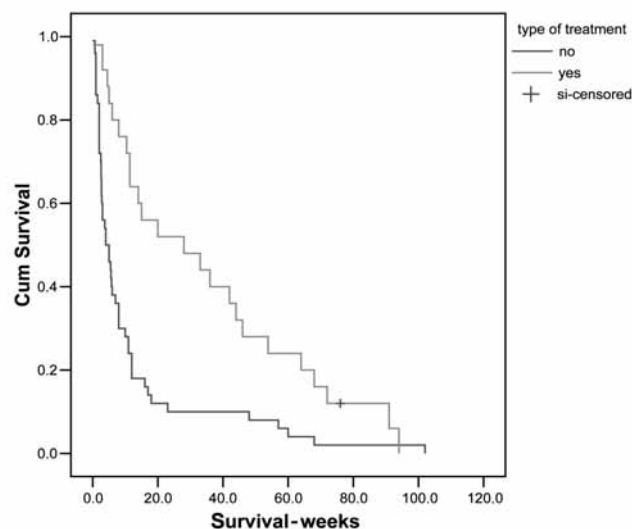
Table 4. — Survival of low score (≤ 14) and high score (> 14) patients by type of treatment.

Score	Treatment	Patients n°	Mean survival (weeks)	Range (weeks)
> 14	Surgical	3	10	3-15
	Medical	19	4	
≤ 14	Surgical	22	37	< 1-94
	Medical	31	17	< 1-102

Mean and median survival were 34 and 28 weeks, respectively (range: 0-94 weeks) in the group of patients who underwent surgery and 12 and four weeks, respectively (range: 0-102 weeks) in the medically treated group. A significant difference was observed in terms of survival for the obstruction in the medically and surgically treated patients, with a prognostic advantage in the surgical group ($p < 0.001$) (Figure 1).

A significantly higher percentage of cases (80%, 20/25 patients) survived longer than eight weeks after the surgical procedure, compared to an 8-week survival rate of 34% (17/50 cases) in the conservative treatment group ($p < 0.0001$). Two out of three patients who survived less than eight weeks had been intraoperatively evaluated as inoperable. After having excluded the patients that were

Survival function



no: no surgery; yes: surgery

Figure 1. — Survival by type of treatment.

not candidates for surgical therapy, a survival higher than eight weeks was observed in 18/22 cases (81%).

Patient distribution according to a recently defined score (Table 3) showed that 53 cases (71%) had a low score (≤ 14) and the remaining 22 cases (29%) had a high score (> 14).

Median survival was 23 weeks (range: 0-102) in the low-score group and four weeks (range: 0-15) in the high-score group. Significantly better survival was observed in the low-score group ($p < 0.0001$).

The correlation between the new prognostic score and the type of treatment of ovarian cancer-related bowel obstruction (surgical versus medical) was evaluated. Twenty-two out of the 25 (88%) surgically treated patients had a low score, and 3/25 (12%) had a high score ($p < 0.05$), while 31/50 (62%) and 19/50 (38%) medically treated patients had low and high scores respectively ($p < 0.05$) (Table 3). Among the 22 surgically treated patients with a low score, two (9%) were intraoperatively defined as inoperable and 18 (81.8%) showed survival longer than eight weeks. Conversely, among the three surgically treated patients with a high score, one (33.3%) was intraoperatively defined as inoperable and two (66.7%) survived longer than eight weeks.

In the surgically treated group of patients, mean and median survival were 38 and 33 weeks, respectively (range: 0-94) when the score was 14 (22 cases), compared to nine and ten weeks, respectively (range: 3-15) in the high-score group (3 cases). In the medically treated group, mean and median survival of patients with a low score was 17 and eight weeks, respectively (range: 0-102) compared to four and three weeks (range: 0-12) in the high-score group, respectively (Table 3). A significant difference in survival for obstruction both in the surgically and medically treated groups of patients according to

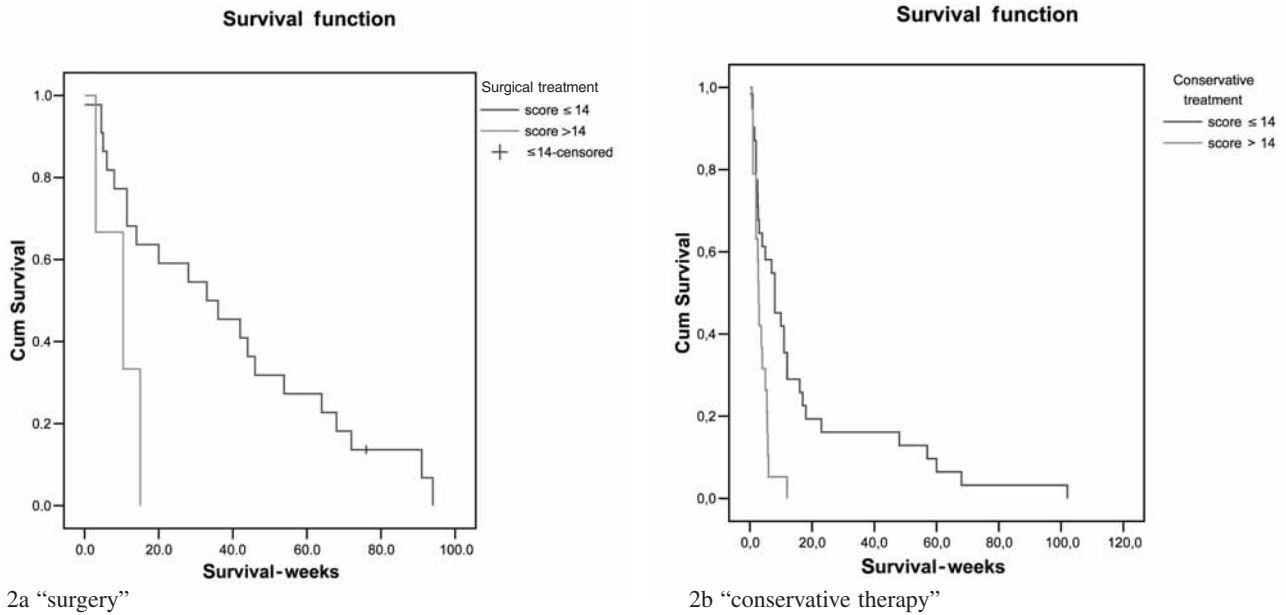


Figure 2. — Survival of patients treated with (a) surgery and with (b) conservative therapy by different scores.

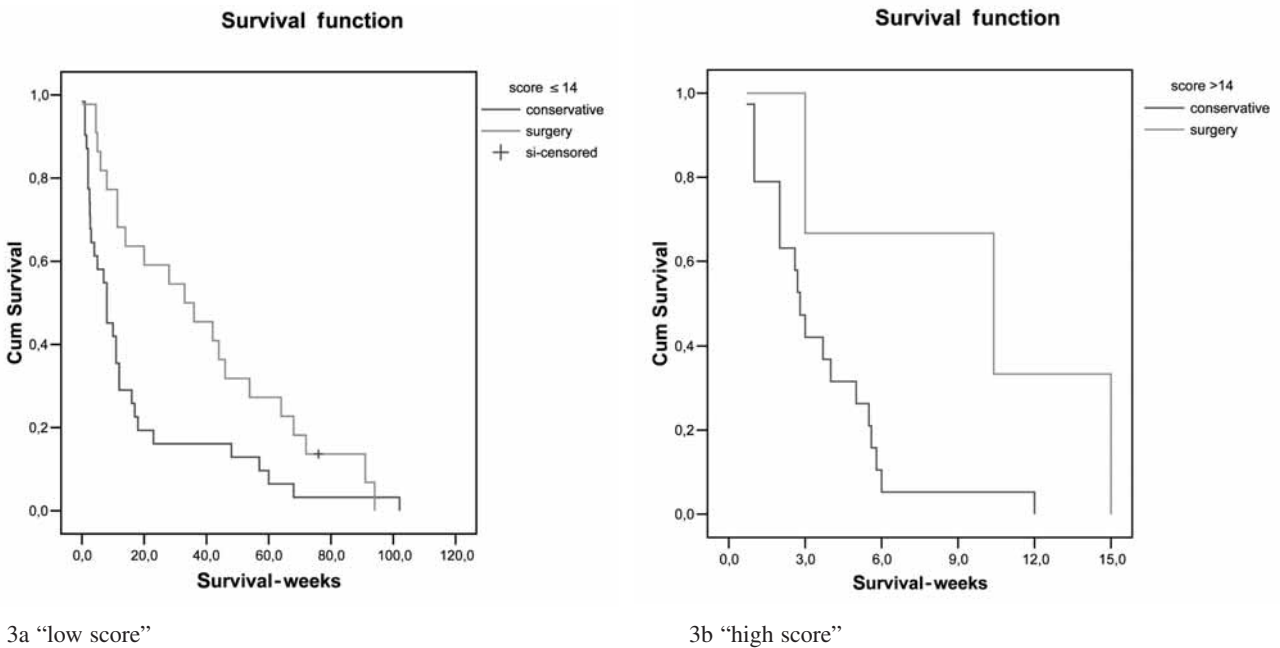


Figure 3. — Survival of patients with (a) low score (≤ 14) and with (b) high score (> 14) by modality of treatment.

the score was observed ($p < 0.05$ and $p < 0.001$ respectively) (Figure 2a and 2b).

Among the patients with low scores, survival according to the medical versus surgical treatment of obstruction is shown in Figure 3a; significant differences were observed in the different groups ($p < 0.05$). Conversely, patients with a high score did not show a marginally significant difference in survival since onset of obstruction in the medically and surgically treated groups ($p = 0.06$) (Figure 3b).

Discussion

The main goal of treatment of ovarian cancer-related bowel obstruction is to obtain some benefit of the quality of life for these patients in terms of both palliation of symptoms and relief of obstruction.

Different studies showed that survival of ovarian cancer patients with bowel obstruction receiving conservative management is shorter when compared to subjects who undergo surgery, and mean survival time ranged from

four to nine weeks and from 12 to 30 weeks, respectively [1, 2, 13, 16].

The selection of the ideal candidate for surgery is still under debate. Palliative surgery should be considered when relief from symptoms is not obtained within three to seven days after one of the medical procedures mentioned above [2]. It has been suggested by the scientific literature [2, 3] that surgical intervention is of unlikely benefit in advanced ovarian cancer patients with bowel obstruction whose life expectancy in less than two months, and/or radiographic contrast of the bowel shows a free passageway with prolonged passage indicative of intestinal motility problems with functional obstruction due to extensive intraperitoneal carcinomatosis [2, 5, 14, 17].

In our study, according to data from the scientific literature, 28% of patients (75/270) with ovarian cancer experienced cancer-related bowel obstruction.

The operative mortality rate was 8% (2/25), lower than that observed in other studies (10 to 25%); moreover, only one death was directly related to the surgical procedure (4%) (Table 1).

It has commonly been experienced that palliative surgery sometimes cannot be performed because of the unexpected intraoperative finding of extensive tumor involvement at exploratory laparotomy. Piver *et al.* [7] reported that 18% of the 60 subjects who underwent surgery for bowel obstruction were actually inoperable. In the series of Krebs and Goplerud [14], 12% of the ovarian cancer patients with bowel obstruction who underwent surgical intervention could not be operated on. In our series, three patients (16%) underwent exploratory laparotomy and were intraoperatively considered as inoperable; still, a significantly better survival was observed in the surgically treated patients compared to the medically treated group ($p < 0.001$). A relatively long mean and median survival in the surgically treated patients was observed (35 and 28 weeks, respectively, compared to data from other studies, ranging from 12 to 30 weeks and from 10 to 20 weeks, respectively). Eighty percent of surgically treated cases survived longer than eight weeks.

The prognostic role of several clinical variables has been evaluated in the scientific literature [1, 2, 5, 6, 14] that could help the clinician to tailor the proper management of advanced ovarian cancer patients with bowel obstruction. Krebs and Goplerud [14] proposed a prognostic score that seemed to offer reliable eligibility criteria for those patients who would be optimal candidates for surgery. A recent study evaluating more prognostic variables than those included in the Krebs and Goplerud score seems to show interesting results in terms of both a better prognostic definition of cases with bowel obstruction and a better selection of the cases that could undergo successful palliation or benefit from surgery [15]. A significantly different survival rate was observed according to this newer score, and the difference remained significant when it was analyzed in both surgically and medically treated groups of patients.

When the comparison between surgical and medical treatment of bowel obstruction was performed in different

groups of patients according to the new score value, it was interesting to observe that the prognostic advantage deriving from a surgical approach to bowel obstruction remains significant in the low-score group of patients, while subjects with a high score did not show a significant benefit from surgery.

In conclusion, from both data in the literature and our results, surgical palliation of ovarian cancer patients with bowel obstruction seems to have an important role to achieve significant relief of symptoms that cannot be expected from non-operative modalities of treatment. Surgical procedures show longer survival from the time of diagnosis of bowel obstruction compared to medical treatment. The prognosis of patients with bowel obstruction related to advanced ovarian cancer is best determined by comprehensive assessment of all prognostic parameters that can be synthesized in different risk scores. One which has been fairly recently defined shows to be highly predictive of the outcome and, therefore, to be very helpful in the selection of patients who are most likely to benefit from surgical intervention. This assessment seems to be supported by the observation that patients with a good prognostic value of this score significantly benefit from surgery, while no significant differences on survival can be observed in the medically treated group of patients with a negative prognostic score.

References

- [1] Bais J.M.J., Schilthuis M.S., Slors J.F.M., Lammes F.B.: "Intestinal obstruction in patients with advanced ovarian cancer". *Int. J. Gynecol. Cancer*, 1995, 5, 346.
- [2] Gadducci A., Iacconi P., Fanucchi A., Cosio S., Miccoli P., Genazzani A.R.: "Survival after intestinal obstruction in patients with fatal ovarian cancer: analysis of prognostic variables". *Int. J. Gynecol. Cancer*, 1998, 8 (3).
- [3] Malone J.M., Koonce T., Larson D.M., Freedman R.S., Carrasco C.H.O., Saul P.B.: "Palliation of small bowel obstruction by percutaneous gastrostomy in patients with progressive ovarian carcinoma". *Obstet. Gynecol.*, 1986, 68, 431.
- [4] Campagnutta F., Cannizzaro R., Gallo A., Zarrelli A., Valentini M., De Cicco M., Scarabelli C.: "Palliative treatment of upper intestinal obstruction by gynaecologic malignancy. The usefulness of percutaneous endoscopic gastrostomy". *Gynecol. Oncol.*, 1996, 62, 103.
- [5] Fernandes J.R., Seymour R.J., Suissa S.: "Bowel obstruction in patients with ovarian cancer: a search for prognostic factors". *A.J. Obstet. Gynecol.*, 1988, 158, 244.
- [6] Jong P., Sturgeon J., Jamieson C.G.: "Benefit of palliative surgery for bowel obstruction in advanced ovarian cancer". *J.C.C.*, 1995, 38, 454.
- [7] Piver M.S., Barlow J.J., Lele S.B., Frank A.: "Survival after ovarian cancer induced intestinal obstruction". *Gynecol. Oncol.*, 1982, 13, 44.
- [8] Castaldo T.W., Petrilli E.S., Ballon S.C., Lagasse L.D.: "Intestinal operations in patients with ovarian carcinoma". *Am. J. Obstet. Gynecol.*, 1981, 139, 80.
- [9] Clarke-Pearson D.L., Chin N.O., De Long E.R., Rice R., Creasman W.T.: "Surgical management of intestinal obstruction in ovarian cancer. I Clinical features, postoperative complications, and survival". *Gynecol. Oncol.*, 1987, 26, 11.
- [10] Larson J.E., Podczaski E.S., Manetta A., Whitney C.W., Mortel R.: "Bowel obstruction in patients with ovarian carcinoma: analysis of prognostic factors". *Gynecol. Oncol.*, 1989, 35, 61.
- [11] Lund B., Hansen M., Lundvall F., Nielsen N.C., Srensen B.L., Hansen H.H.: "Intestinal obstruction in patients with advanced carcinoma of the ovaries treated with combination chemotherapy". *Surg. Gynecol. Obstet.*, 1989, 169, 213.

- [12] Salomon H.J., Atkinson K.H., Coppleson J.V.M., Elliott P.M., Houghton C.R., Tattersall M.H., Green D.: "Bowel complications in the management of ovarian cancer". *Aust N.Z. J. Obstet. Gynecol.*, 1983, 23, 65.
- [13] Tunca J.C., Buchler D.A., Mack E.A., Ruzicka F.F., Crowley J.J., Carr W.F.: "The management of ovarian-cancer-caused bowel obstruction". *Gynecol. Oncol.*, 1981, 12, 186.
- [14] Krebs H.B., Goplerud D.R.: "Surgical management of bowel obstruction in advanced ovarian carcinoma". *Obstet. Gynecol.*, 1983, 61, 327.
- [15] Rubin S.C., Hoskins W.J., Benjamin I., Lewis J.L.: "Palliative surgery for intestinal obstruction in advanced ovarian cancer". *Gynecol. Oncol.*, 1989, 34, 16.
- [16] Redman C.W.E., Shafi M.I., Ambrose M., Lawton F.G., Blackledge G.R.P., Luesley D.M. *et al.*: "Survival following intestinal obstruction in ovarian cancer". *Eur. J. Surg. Oncol.*, 1988, 14, 383.
- [17] Sartori E., Chiudinelli F., Pasinetti B., Zavagnolo V.: "Palliative care in advanced ovarian cancer patients with bowel obstruction". *Gynecol. Oncol.*, 2005, 99, s215.

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