Research Article

Recurrent Ovarian Cancer with the Involvement of Urinary Organs: is There Place for Secondary Cytoreductive Surgery?

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Abstract

The objective of the research was to estimate early and long-term results of secondary cytoreductive surgery performed for recurrent ovarian cancer with involvement of urinary organs.

Materials and methods. The study included 62 patients with recurrent ovarian cancer treated in the Institute of General and Emergency Surgery named after V.T. Zaitsev of the Academy of Medical Sciences of Ukraine during January 2009 – September 2015. Selection criteria for secondary cytoreductive surgery were the following: recurrent ovarian cancer with involvement of the bladder and/or the ureter, no urologic surgery during primary cytoreductive surgery, the ECOG performance status of 0-2. Urological surgery that had been a subject to the analysis was the following: cystoscopy with or without intraoperative urethral stenting, bladder resection, ureterectomy, ureteral reimplantation, cystectomy with further reconstruction. Evaluation criteria included the presence and the level of surgical and postoperative urological complications within 30 days after surgery, relaparatomy rates, postoperative mortality, type of cytoreduction. Long-term results were evaluated through recurrence rates after secondary cytoreductive surgery, median survival, disease-free survival and overall survival.

Results. Volumes of performed surgery (excluding urological one) were the following: lymphadenectomy (n=29; 46.7%), bowel resection (n=17; 27.4%), vascular resection (n=4; 6.5%) and others. Minimally invasive urological surgery included urethral stenting (n=6; 9.7%) and cystoscopy (n=13; 20.9%). Bladder resection was performed in 26 (41.9%) cases, cystectomy – in 17 (27.4%) cases. R0 resections were performed in all the cases. Postoperative non-urological complications were observed in 7 (11.2%) patients. Urological complications were found in 9 (14.5%) patients. Postoperative mortality was 3.2%. Recurrence was documented in 7 (11.3%) cases. Median survival was 24 months. Follow-up mortality was 30% (n=18).

Conclusions. The results of combined secondary cytoreductive surgery performed for recurrent ovarian cancer with involvement of urinary organs indicate the possibility of en bloc resection of tumor and surrounding organs at acceptable rates of postoperative complications and mortality. Extended combined surgery and even pelvic exenteration are effective in treatment of patients with recurrent ovarian cancer.

Keywords
cytoreductive surgical procedures; ovarian neoplasms; recurrence; urologic surgical procedures

Problem statement and analysis of the recent research

Treatment of recurrent ovarian cancer (ROC) with multidisciplinary approach has been developed during the last decade. The collaboration of highly qualified specialists (chemotherapists, radiologists, oncogynecologists, oncurologists, vascular surgeons, etc.) allows to extend indications for secondary cytoreductive surgery (SCRS) and to increase the rate of optimal cytoreduction which are the principal factors for improved long-term outcomes.

Topographic features of female pelvis contribute to local spread of ovarian cancer on the surrounding anatomical structures including urinary organs that, consequently, should be operated and restorated during SCRS. The involvement of urinary organs in ROC is a background of such serious complications as urinary tract obstruction with further hydronephrosis development, chronic renal failure, infectious and septic complications, bleeding, urogenital fistula formation. It significantly impairs the patients’ quality of life and may limit treatment opportunities as well as worsen long-term outcomes. Therefore, relevant complex surgical tactics can be crucial for improving treatment results and social adaptation of patients with locally advanced ROC.

The objective of the research was to estimate early and long-term results of SCRS performed for ROC with involvement of urinary organs.
1. Materials and methods

We retrospectively analyzed the data of 62 patients with ROC and involvement of urinary organs who underwent SCRS was performed in the Institute of General and Emergency Surgery named after V.T. Zaitsev of the Academy of Medical Sciences of Ukraine during January 2009 – September 2015. The privacy rights of human subjects were observed.

Selection criteria for SCRS were the following: ROC with involvement of the bladder and/or the ureter, no urologic surgery during primary cytoreductive surgery, the ECOG performance status of 0-2. Exclusion criteria for SCRS were the following: tumor spread beyond the pelvis (carcinomatosis), distant metastases, ascites, pleural effusion, serious infectious urological complications, septic foci in small pelvis, decompensated chronic renal insufficiency, severe somatic pathology.

Preoperative examination was performed in accordance with clinical standards and protocols [1]. The determination of serum creatinine level and excretory urography were mandatory. Special attention was paid when preoperative creatinine level had reached more than 150 mg/dL and nephrostomy had been present.

Urological surgery that had been a subject to the analysis was the following: cystoscopy with or without intraoperative urethral stenting, bladder resection, ureterectomy, ureteral reimplantation, cystectomy with further reconstruction. Evaluation criteria included the presence and the level of surgical and postoperative urological complications within 30 days after surgery, relaparotomy rates, postoperative mortality, type of cytoreduction. Postoperative complications were staged using the Clavien-Dindo classification [2]. Long-term results were evaluated through recurrence rates after SCRS, median survival, disease-free survival and overall survival. Survival data analyses via the Kaplan-Meier method were performed using SPSS version 17 (SPSS, Chicago, IL, USA).

2. Results

SCRS was performed in 62 patients with ROC. The mean age was 52±6.2 years (25-76 years). The elevation of creatinine level, hydronephrosis and nephrostomy were found in 2 (3.2%), 9 (14.5%) and 4 (6.4%) cases, respectively. SCRS was performed through laparotomy. Volumes of performed surgery (excluding urological one) are listed in Table 1. All the patients underwent urological surgery during SCRS (Table 2). The Bricker ileal conduit was performed with mucosa-to-mucosa anastomosis. If total pelvic exenteration was performed, 2 colostomies and ileal conduit were created separately.

R0 resections (no visible disease) were performed in all the cases. Postoperative non-urological complications were observed in 7 (11.2%) patients. Urological complications were found in 9 (14.5%) patients, level III-IV urological complications were detected in 3 (4.8%) cases. Postoperative complications are listed in Table 3.

| Surgery                        | n. (%)     |
|--------------------------------|------------|
| Lymphadenectomy                | 29 (46.7%) |
| - pelvic + paraaortic          | 22 (35.5%) |
| - paraaortic                   | 8 (12.9%)  |
| Bowel resection                | 17 (27.4%) |
| - small bowel                  | 5 (8%)     |
| - colorectal                   | 12 (%)     |
| Vascular resections            | 4 (6.5%)   |
| Other surgeries a              | 11 (17.7%) |

Note.

a - Omentectomy, peritonectomy, appendectomy

Analyzing urological complications, it should be noted that substantial part was associated with urine leakage through the anastomosis. It resulted in the formation of vesicovaginal fistula (n=1) and uretero-abdominal fistula (n=2). Relaparotomy was performed in 3 cases: small bowel obstruction, bleeding from the external iliac artery, pelvic abscess formation. 2 patients died within 30 days after surgery; postoperative mortality was 3.2%.

Recurrence was observed in 7 (11.3%) cases (locoregional recurrence was detected in 5 (8%) patients and systemic recurrence in 2 (3.2%) patients). Two cases of distant metastases were identified: lung and supraclavicular lymph node metastases. Median survival was 24 months (2-62 months). Follow-up mortality was 30% (n=18). In five cases, patient follow-up was interrupted (median follow-up was 32 months, range - 11-76 months).

3. Discussion

In past, pelvic exenteration as a palliative procedure for locally advanced pelvic tumors was proposed by Brunschwig A. (1948) [3]. Today, combined pelvic surgery is used with curative intent in order to achieve radical resection and improve treatment results. According to latest data, a 5-year survival after pelvic exenteration is more than 50% [4-7]. Goldberg JM et al. (1998) concluded that the indications for palliative exenteration should be exceptional and strictly individual, and, generally, this type of surgery should not be used for palliation [5]. Nguyen DQ et al. (2005) have not shown any survival improvement after palliative pelvic exenteration [7]. In the present study, all combined operations were performed as curative ones with R0.

The complications after pelvic exenteration are often associated with significant space in the pelvic cavity. It leads to high rates of intestinal obstruction and fistula formation in the postoperative period. According to the published data, locoregional recurrence rate is 24-6% [6, 7, 8-10]. In the present study, this rate was 11.3% (5 local and 2 systemic). There was no statistically significant effect of exenteration
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Table 2. Urological surgery during SCRS performed for ROC

| Surgery                                                                 | n, (%)     |
|------------------------------------------------------------------------|------------|
| Minimally invasive surgery:                                            |            |
| - ureteral stenting                                                    | 6 (9.7%)   |
| - cystoscopy                                                           | 13 (20.9%) |
| Resective surgery:                                                     |            |
| - bladder resection                                                    | 26 (41.9%) |
| - bladder resection without plastic procedures                         | 11 (17.7%) |
| - bladder and ureter resection with Boari flap reconstruction           | 5 (8.1%)   |
| - ureter resection with ureterocystoneostomy according to Politano-Leadbetter | 10 (16.1%) |
| - cystectomy                                                           | 17 (27.4%) |
| - anterior pelvic exenteration with the Bricker ileal conduit          | 7 (11.3%)  |
| - total pelvic exenteration with colostomy and the Bricker ileal conduit | 10 (16.1%) |

4. Conclusions

The results of combined SCRS performed for ROC with involvement of urinary organs indicate the possibility of en bloc resection of tumor and surrounding organs at acceptable rates of postoperative complications and mortality. Despite the localization of ROC involvement of the bladder and/or the ureter it could be removed. The survival rates of our study are close to those given in the world literature data. Extended combined surgery and even pelvic exenteration are effective in treatment of patients with recurrent ovarian cancer.

5. Prospects for further research

The current study indicates that it is still topically to carry out research works dedicated not only to surgery for primary cancer lesions, but also to surgery performed for secondary cancer lesions. The aggressiveness of local treatment may be beneficial for patients with ROC; more data are needed to reject or to adopt this point of view.

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Table 3. Complications after SCRS performed for ROC<sup>a</sup>

| Complication                        | Total, n (%) | Grade I-II, n (%) | Grade III-IV, n (%) |
|-------------------------------------|--------------|------------------|---------------------|
| Early non-urological complications  | 13 (21.6%)   | 10 (16.1%)       | 3 (4.8%)            |
| Bleeding                            | 1 (1.6%)     | 1 (1.6%)         | -                   |
| Sepsis                              | 2 (3.2%)     | 1 (1.6%)         | 1 (1.6%)            |
| Abdominal abscess                   | 1 (1.6%)     | 1 (1.6%)         | -                   |
| Wound infection                     | 3 (4.8%)     | 2 (3.2%)         | 1 (1.6%)            |
| Heart failure                       | 2 (3.2%)     | 2 (3.2%)         | -                   |
| Deep vein thrombosis                | 1 (1.6%)     | 2 (3.2%)         | -                   |
| Acute renal failure                 | 1 (1.6%)     | 1 (1.6%)         | -                   |
| Intestinal obstruction              | 2 (3.2%)     | -                | -                   |
| Early and late urological complications | 17 (27.4%) | 14 (22.5%) | 3 (4.8%) |
| Bladder dysfunction                 | 7 (11.2%)    | 5 (8%)           | 2 (3.2%)            |
| Fistulas                            |              |                  |                     |
| - vesicovaginal                     | 3 (4.8%)     | 3 (4.8%)         | -                   |
| - ureter-abdominal                  | 1 (1.6%)     | 1 (1.6%)         | -                   |
| Ureteral stenosis                   | 4 (6.5%)     | 4 (6.5%)         | -                   |

Note.
<sup>a</sup> - % of complication was calculated from the total number of patients. Several patients had more than one complication.

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Received: 6 July 2017

Revised: 28 Sept 2017

Accepted: 29 Sept 2017