

Borderline ovarian tumors: outcomes of fertility sparing surgery

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Summary

Aim: Borderline ovarian tumors (BOT) account for ten to 20 percent of all epithelial ovarian carcinomas and often occur in reproductive ages. The aim of this study was to evaluate the clinical and reproductive outcomes of patients who were diagnosed with BOT and underwent fertility sparing surgery. **Materials and Methods:** Patients younger than 40 years who underwent fertility sparing surgery for BOT from 2004 to 2012 were reviewed retrospectively and were evaluated according to the reproductive and clinical outcomes. **Results:** Twenty-eight patients younger than 40 years with BOT underwent fertility sparing surgery. Median follow up time was 42 ± 28.1 months. During the follow up period, two patients (7.1%) developed recurrence at 35 and 36 months, respectively. Five (17.9%) out of 28 patients became pregnant during the follow up period. **Conclusion:** Fertility sparing surgery should be the first choice for the treatment of BOT in patients who wish to preserve fertility.

Key words: Borderline ovarian tumors; Fertility sparing surgery; Pregnancy.

Introduction

Borderline ovarian tumors (BOT) account for ten to 20 percent of all epithelial ovarian carcinomas and often occur in reproductive age. This group of tumors are a distinct diagnostic category of ovarian tumors, which have a favorable prognosis compared with the invasive epithelial ovarian tumors. Due to the fact that one-third of the cases with borderline tumors are under the age 40, preserving of childbearing capacity and ovarian hormonal function is more important despite the proper staging procedures, including hysterectomy and bilateral salpingo-oophorectomy [1]. The treatment has to be personalized according to the fertility request of the patients. Although fertility sparing treatment modalities such as cystectomy or unilateral salpingo-oophorectomy are usually performed for maintenance of ovarian function [2, 3], preservation of uterus with ovarian cryopreservation is also an option for preserving childbearing capacity [4]. Fertility sparing surgery (FSS) is feasible in both early and advanced stages of disease [5]. The aim of this study was to evaluate the clinical and reproductive outcomes of patients who underwent FSS in the present institute.

Materials and Methods

Fifty-five patients diagnosed with BOT from 2004 to 2012 were retrospectively reviewed from the hospital records and patient charts. Patients who were younger than 40 years and underwent FSS with pathologically confirmed BOT on the definitive report were included in the study. Preservation of ovarian function and uterus was defined as FSS. Patients who were diagnosed as menopausal after surgery, who had an insufficient follow up data,

were excluded from the study. Patients' age, obstetric history, menstrual cycle, complaint, mode of surgery, type of surgical procedure, and type of BOT histology were reviewed. The laparotomies were achieved with midline incision. Regardless of the mode of surgery, peritoneal washings and inspection of the abdominal cavity were performed at the time of surgery. During the follow up period, patients were assessed with pelvic examination, CA-125 testing and ultrasonography every three months for the first two years, every six months up to five years and then annually. The proper follow up continued during pregnancy and thereafter.

Results

Twenty-eight patients younger than 40 years with BOT underwent fertility sparing surgical procedures. The median age of the patients was 29.07 ± 5.41 years. Fifteen (53.5%) of the patients were nulliparous and all of the patients had regular menstrual cycles. The most common complaint was pelvic pain (39.3%). Demographic characteristics of the patients are presented in Table 1. The mean of preoperative CA-125 value was 52.07 ± 101.24 IU/ml. Four (14.2%) patients underwent laparoscopy and the remaining underwent laparotomy. Cystectomy, cystectomy, and lymphadenectomy, unilateral salpingo-oophorectomy (USO), and USO+ lymphadenectomy were performed in eight (28.5%), five (17.9%), 13 (46.4%), and in two (7.1%) of the patients, respectively (Table 2). Omentectomy was performed in seven (25%) of the patients who also underwent lymphadenectomy. Histologic subtype of the tumor was serous in 20 (71.4%) of the patients and mucinous in eight (28.6%) of the patients. A total of 28 patients were evaluated in early stage disease, 20 (71.4%) of which were in Stage IA and the remaining eight (28.6%) were in Stage IC. None of the patients had adjuvant chemotherapy after surgery. Median follow up time was 42 ± 28.1 months. Dur-

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Table 1. — Patients' demographic characteristics.

	Mean	Standard deviation (SD)
Age (years)	29.07	± 5.41
Gravida (n)	1.17	± 1.56
Parity (n)	0.92	± 1.18
Abortion (n)	0.21	± 0.56

Table 2. — Types of surgeries performed.

Type of surgery	n (28)	% (100)
Cystectomy	8	28.6
Cystectomy + lymphadenectomy	5	17.9
Unilateralsalpingo-oophorectomy	13	46.4
Unilateralsalpingo-oophorectomy + lymphadenectomy	2	7.1

ing the follow up period, two (7.1%) of the patients developed recurrence at 35 and 36 months after the surgery. One of the recurrences developed after cystectomy and the other developed after cystectomy and lymphadenectomy. The recurrences were treated with total abdominal hysterectomy and bilateral salpingo-oophorectomy. Among 28 patients, only one (3.6%) patient was pregnant at the time of surgery and pregnancy continued uneventfully. Eight (28.6%) patients attempted to conceive and five (17.9%) of them became pregnant spontaneously during the follow up period and delivered healthy newborns at term. One of them conceived four times in total, three of which resulted in abortion. During the pregnancy, none of the patients had adverse outcomes. One of the patients delivered by cesarean section and the other four vaginally. After deliveries, the follow up continued uneventfully and no recurrences were diagnosed.

Discussion

Since BOT was first described, treatment options became more conservative with the knowledge of rare recurrence rates and excellent prognosis. In the present study the authors exposed that reproductive outcomes after FSS for BOT are promising and the recurrence rate is comparable with the previously published data [2, 3].

Various studies have suggested the oncologic safety of FSS in patients with early-stage BOT [2, 3], also feasibility of FSS in advanced stages of disease was reported [5]. In the present study, all of the patients were evaluated in early stages of disease which varied between Stage IA to IC.

As the importance of surgical staging was previously shown for patients who undergo FSS, the procedure is suggested as a complete surgical staging, except for total abdominal hysterectomy and bilateral salpingo-oophorectomy. Furthermore, systematic lymphadenectomy is not recommended for comprehensive staging surgery, unless in the presence of lymph node positivity [6]. Regardless of the

mode of surgery, either laparoscopy or laparotomy, peritoneal washings and exploration of the abdominal cavity were performed in the present study. In seven (25%) out of 28 patients in this study, lymphadenectomy was performed but lymph node positivity was not determined.

Preserving of uterus with ovarian cryopreservation was reported to be feasible in 53% of patients in which the procedure was planned before surgery [4]. Ovarian cryopreservation may be an option for patients with bilateral BOT.

The rate of spontaneous fertility was reported to be about 50% after FSS [7]. The rates of pregnancy are promising and the complication rates are not disappointing after conservative treatment [2, 8]. Neither the rates nor the ongoing of pregnancy are influenced by the disease, hence FSS is worthy for patients who wish to preserve fertility.

In a multicenter study, the recurrence rate was reported 30% for cases who underwent cystectomy [9]. Also, in the presented cases, both recurrences occurred after cystectomy and they accounted for 15.4% of the patients who underwent cystectomy. Cyst rupture, type of surgical procedure, stage, and peritoneal implants were reported to be independent prognostic factors for recurrence in several studies [9-11].

In a French multicenter study, Fauvet *et al.* recommended salpingo-oophorectomy rather than cystectomy for borderline ovarian tumors in pregnancy [12]. In this study, one of the patients who underwent salpingo-oophorectomy for BOT was pregnant and the pregnancy continued uneventfully without any adverse outcomes.

Romeo *et al.* revealed the association between the shorter time of recurrence and incomplete surgery [6]. After completion of childbearing, prophylactic removal of remaining ovary/ovaries in which most of the recurrences develop, may be recommended [13]. The time of surgery may be delayed until the diagnosis of recurrences or after menopause in younger patients [2]. To date, there is no published data evaluating the efficiency of prophylactic oophorectomy for BOT in the literature and further studies are needed.

Conclusion

FSS should be the first choice for the treatment of BOT in patients who wish to preserve fertility, but the higher recurrence rates, especially in cystectomy, should be kept in mind.

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