

Surgical Management of Epithelial Ovarian Cancer at Community Hospitals: A Population-Based Study

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Background and Objectives: Accurate surgical staging and maximal tumor reduction are the basic management principles of epithelial ovarian cancer (EOC). The purpose of our study is to report on staging practices and the primary surgery of EOC in a region that has no tertiary oncological referral center and no surgical gynecological oncologist.

Methods: Between 1 January 1989 and 30 December 1995, the Valais Cancer Registry had registered 157 patients with ovarian cancer stage I–IV. Hospital case notes were reviewed retrospectively and patients who did not have a surgical abdominal exploration (n = 20), with borderline (n = 12) or non-epithelial tumors (n = 13), operated upon in other regions (n = 8) and without complete medical records (n = 2) were excluded. Therefore 102 patients were evaluated.

Results: The interventions have been performed in 7 regional hospitals and 1 private clinic by 24 obstetricians-gynecologists and 8 general surgeons. In early EOC, 9% random peritoneal biopsies and 3% retroperitoneal lymph node samplings have been performed. In advanced EOC, 40% of patients had total abdominal hysterectomy, bilateral salpingo-oophorectomy and omentectomy and 42% had cytoreductive surgery with a residual tumor of ≤ 2 cm.

Conclusions: The present study is a population-based study over a 7-year period within a region that has only community hospitals. Patients with early EOC had incomplete staging and patients with advanced EOC an insufficient rate of radical surgery. Women with a suspicion of ovarian cancer should be referred to centers with experienced tumor surgeons.

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KEY WORDS: neoplasm; ovary; surgery; staging; care patterns

INTRODUCTION

Epithelial ovarian carcinoma (EOC) is, in the Swiss canton Valais as in most western countries, the leading cause of death due to gynecologic malignancy [1]. In Valais (135,000 women), 22 new cases of ovarian cancer are diagnosed annually with approximately 9 (39%) cases with early FIGO stage I–II and 14 (61%) with advanced FIGO stage III–IV [1]. The region under study is a region geographically and politically well-defined, located in the Swiss Alps, without gynecologic oncol-

gist and without tertiary referral center. Currently, few patients are referred to University Medical Centers located outside of the canton because of insurance and administrative policies that require that available treatments are performed in the canton of residence of the patient. Transfers to extracantonal institutions need medical justifications and administrative approval by the cantonal health authorities.

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The basic principle of EOC management is to accurately assess surgical stage and obtain maximal tumor cytoreduction. These procedures are widely recognized as a crucial determinant in the proper treatment of ovarian cancer [2–6]. Several studies have reported deficiencies of ovarian cancer surgery. These studies emphasize that management of ovarian carcinoma requires knowledge of the pattern of spread in this disease and also technical skills [7–12].

The advent of managed care stimulated considerable interest in regionally different patterns of care in cancer patients, to show whether centralization of treatment allows for optimal surgical treatment, a better quality of life and a survival advantage [13–16]. The aim of our study was to assess the adequacy of primary surgery and staging evaluation of EOC performed in a region without a tertiary oncological referral oncology center.

MATERIALS AND METHODS

A retrospective analysis of all patients with histologically proven ovarian cancer registered from 1 January 1989 to 31 December 1995 at the Valais Cancer Registry was undertaken. Based on the registry data, we have reviewed all medical records in each hospital, including pathology, operative, hospital and oncological reports. Permission to examine the records was obtained from the consultants. Data collected on each patient included age at diagnosis, tumor histology, grade of differentiation and FIGO stage. Management data collected included the hospital where the patient was treated, the *specialty* of the operating surgeon (obstetrician/gynecologist or general surgeon or if the patient was referred to a surgical oncologist), the *operative procedures* (unilateral salpingo-oophorectomy or bilateral (BSO) with or without total abdominal hysterectomy (TAH) (and with or without omentectomy (total or partial), the diameter of largest remaining nodule [≤ 2 or >2 cm]) and the *staging practice* for FIGO stage I–II. For this, we have abstracted the following procedures: type of skin incision, presence of frozen section during surgery, presence of peritoneal washing cytology, biopsy(ies) of pelvic side wall peritoneum, biopsies of right and left paracolic gutters, biopsy(ies) or smear of the right hemidiaphragm, pelvic and para-aortic lymph node sampling. If one or more procedures listed were not reported, it was assumed it was not performed. Missing or insufficiently detailed information was allocated to a not-known category. The percentage of patients was calculated from only those patients with available data.

RESULTS

Patients Characteristics

Between 1989–95, 157 patients with ovarian cancer were registered at the Cantonal Cancer Registry of the Valais. We have excluded from our analysis all patients:

TABLE I. Characteristics of Patients Operated for Epithelial Ovarian Cancer at Community Hospitals (n = 102)

	FIGO stage I–II	FIGO stage III–IV
Number of patients	37	65
Patient age (years)		
Median age (years)	56	63
<50	9	14
55–70	19	29
>70	9	22
Tumor Stage		
I	27	
IA	14	
IB	4	
IC	9	
II	10	
IIA	1	
IIB	2	
IIC	7	
III		50
IV		15
Tumor histology		
Serous	13	33
Mixed	10	6
Mucinous	9	13
Endometrioid	3	6
Clear cell	1	5
Adenocarcinoma (unclassified)	1	2
Tumor grade		
G1	19	15
G2	10	28
G3	5	16
Unknowns	3	6

who did not undergo a surgical abdominal exploration (n = 20), were operated upon in other regions (n = 8), with borderline tumors (n = 12), with non-epithelial tumors (n = 13) and without complete medical records (n = 2). The patients (n = 20) who did not have surgical abdominal exploration had their diagnosis established on the basis of liver or lymph node biopsies or abdominal or pleural fluid cytology. These 20 patients were mainly elderly (11 patients were 80 years old or over) with comorbidity. Among the patients operated in other regions (n = 8), 5 were referred to a gynecologic oncologist (tertiary medical center), 4 had TAHBSO and omentectomy and 2 of them had retroperitoneal lymph node sampling. One patient had a conservative surgery because fertility was a consideration. A total of 102 patients including 37 patients with FIGO stage I–II and 65 patients with FIGO stage III–IV treated in the canton “Valais” form the basis of the present review. Patient’s characteristics are summarized in Table I.

Specialty of the Primary Surgeon and Hospitals Characteristics

The interventions have been performed in 7 regional hospitals (96 interventions) and 1 private clinic (6 inter-

TABLE II. Staging Procedures of Patients Operated for Epithelial Ovarian Cancer (FIGO Stage I–II) at Community Hospitals (n = 37)

	n (%)
Abdominal Incision	
Pfannenstiel	9 (25%)
Midline subumbilical	14 (39%)
Midline subumbilical extending above umbilicus	13 (36%)
Not known	1
Biopsies	
Peritoneal washing	30 (81%)
Pelvic side wall peritoneum	5 (14%)
Right and left paracolic gutter	3 (9%)
Smear of the right hemidiaphragm	5 (14%)
Para-aortic lymphadenectomy	1 (3%)
Pelvic lymphadenectomy	1 (3%)

ventions), mean 13.2 interventions per hospital (range 6–31) and less than 2 interventions per hospital and per year. A total of 32 different surgeons have performed these interventions, including 24 obstetricians-gynecologists and 8 general surgeons. In 35 cases, both a gynecologist and a general surgeon operated. There is only one pathology institute in the area that can examine frozen section and some hospitals are located more than 30 miles from this institute.

Surgical Procedures for Early Stages

Types of skin incisions are reported in Table II. A Pfannenstiel incision was performed in 9 patients (25%) and none were converted into a Churney incision or incision of an other type. A peritoneal cytology collected from peritoneal fluid or from washing was collected in 30/37 cases (81%). Seven patients had no cytology, and 6 of them were referred with stage IA or IB. Two patients did not undergo TAHBSO because of fertility considerations. Multiple biopsies including pelvic side-wall peritoneum, right and left paracolic gutters and right hemidiaphragm was performed in 3 patients (9%); all of them had a midline incision extending above the umbilicus. All patients who had multiple biopsies had a TAHBSO and omentectomy. No biopsies were performed on patients without peritoneal cytology. With the exception of 1 patient with residual disease after surgery of >2 cm, all the others were considered to harbor no macroscopic residual disease. A frozen section during surgery was performed in 8 patients. All patients had peritoneal cytology and 63% had TAHBSO and omentectomy vs. 19% for the patients without frozen section. None of the insufficiently staged patients has been re-operated to accurately define the extent of the disease.

Surgical Procedures for Advanced Stage

Initial surgical procedures are listed in Table III. Only 40% of the patients had HTABSO and omentectomy.

TABLE III. Operative Procedures and Residual Tumor of Patients Managed at Community Hospitals for Epithelial Ovarian Cancer (FIGO Stage I–IV) (n = 102)*

	(n = 37) FIGO Stage I–II	(n = 65) FIGO Stage III–IV
Resections		
TAH + BSO + OM	12 (32%)	26 (40%)
TAH + BSO	18 (49%)	7 (11%)
BSO (with or without OM)	3 (8%)	22 (34%)
USO	4 (11%)	
Mass excisions and/or biopsy (ies) for histology		10 (15%)
Diameter of Residual Tumor after Primary Surgery		
≤2 cm	36	26 (42%)
>2 cm	1	36 (58%)
Not known		3

*TAH, total abdominal hysterectomy; BSO, bilateral salpingo-oophorectomy; OM, omentectomy; USO, unilateral salpingo-oophorectomy.

Seven patients had pelvic or para-aortic lymph node sampling. Bowel surgery included 3 small bowel resections and 9 large bowel resections. Primary surgery resulting in the debulking to ≤2 cm was performed in 42% of cases. Ten patients (15%) had abdominal involvement consistent with the description of “inoperable” or “frozen pelvis” and these patients underwent a laparotomy with only biopsies or mass excision.

We have not considered survival rates and statistical testing of differences in cases managed by obstetrician-gynecologists and general surgeons because of the small sample size and because of the dilution of the statistical significance (102 patients operated in 8 different hospitals or clinics by 32 gynecologists or surgeons over a 7 years period).

CONCLUSIONS

Our study was based on a regional cancer registry and reflects the overall surgical management of the complete ovarian cancer population within a politically and geographically well-defined region that has no university hospital and no experienced gynecological oncologist. Appropriate staging of early EOC is an important subject in that accurate staging is crucial for prognosis and treatment decisions. Several previous studies have concluded that surgical staging of apparently early ovarian cancer is often incomplete [7–13]. Young and colleagues in the Ovarian Cancer Study Group reported results from 100 patients with presumed early-stage (IA–IIB) ovarian cancer who underwent re-staging procedures [7]. Nearly a third (31%) of the patients were found to have a more advanced stage and 23 of these 31 patients (77%) had stage III disease. Other reports have pointed that specialization of the operating surgeons influence the patient’s management and survival [5,17–20]. Regarding our data

about early EOC, it consistently shows serious deficiencies from the recommended standards of care.

The following 3 considerations can be made. First, too many patients had an insufficient skin incision (25% with Pfannenstiel). Such a type of incision do not allow a full access to the abdominal cavity and several studies have reported an improper staging associated with an inadequate surgical incision [7,11,12]. Our present study confirms this observation; patients who had multiple peritoneal biopsies, had all a midline subumbilical incision extending above the umbilicus.

Second, the randomized peritoneal biopsies and the node sampling rate is very poor. Of all gynecological malignancies, ovarian cancer has the highest rate of positive retroperitoneal nodes, that may be present even in cases with little or no apparent intraperitoneal involvement. It has been reported that between 9.5–30% of apparent stage I–II have paraaortic or pelvic node involvement [21–25]. Ultrasonography and computerized axial tomography scans have been used increasingly to diagnose and stage ovarian tumors, but these procedures have serious limitations for the evaluation of retroperitoneal spread, like intraoperative palpation that is incorrect in 33–60% of cases with early ovarian cancer [25–28]. In our study only 1 patient (1/37) had a sampling of retroperitoneal node.

Third, there is a low rate of frozen section with only 8 out of 37 patients who had such an exam during surgery that is partly due to the distance between the hospitals and the Central Institute of Pathology. We have observed that patients, who had a per-operative histological exam, were better staged and our impression is that in several cases the surgical status was not clearly suggestive of ovarian cancer, the malignancy has not been recognized by the surgeon and consequently some intraoperative evaluations have been omitted. We think that the surgeons should anticipate a malignant diagnosis and should request a frozen section during surgery of cases of potentially malignant disease. Understaging may be of critical importance if inadequate treatment is initiated on the basis of misinformation. In our study, cytological analysis of peritoneal fluid was not done in 6 patients referred with stage IA or IB. Peritoneal cytology may be positive in 36% of patients with apparent stage IA and if it is positive the stage would be IC and these patients should receive potentially curative adjuvant therapy [29]. Peritoneal washing, however, is still debated after the report of Finn et al. who found that peritoneal washings may increase the risk of tumor dissemination and had a negative effect on survival [30].

Standard surgery for advanced EOC should include TAHBSO, omentectomy and maximal cytoreductive surgery. The therapeutic value of obtaining a disease-free or minimal residual tumor is widely accepted and it improve both prognosis and quality of life for patients.

Piver et al. in a prospective study at a tertiary medical center performed TAH in 98% of cases, BSO in 100%, omentectomy in 86% of cases, and a cytoreductive surgery to residual tumor of ≤ 2 cm in 76% of cases [31]. In our series, TAHBSO, omentectomy and cytoreduction were performed respectively in 40% and 42% of cases and 15% of the patients were considered as inoperable. It is clear that not all patients are suitable for extensive surgery and the decision to perform the procedure is influenced by the patient's age and medical condition, moreover the removal of some tumor masses was impossible. In our study we felt that too many patients with advanced stage EOC had conservative surgery. Our impression is that some surgeons have been discouraged at the time of laparotomy when they were confronted with widespread ovarian cancer and the only surgery performed resulted in omental or abdominal tumor biopsy of only the most accessible tumor nodules.

The main reason why surgical staging is incomplete is probably the risk of intraoperative and postoperative complications. Omissions were more frequent for procedures with an increased risk or difficulty, such as lymphadenectomy, than for very simple procedures, such as washing for peritoneal cytology. In the series reported by the American Gynecologic Oncology Group with patients who had comprehensive surgery, 29% of patients had at least one operative complication, including injuries to the bowel, Cava vein, spleen, ureter, bladder, diaphragm and postoperative lymphocysts [12]. This suggests that surgeons must be skilled in the repair of vascular, gastrointestinal and genitourinary injuries when performing comprehensive staging. In our study, many of the surgeons perform less than one radical operation per year and therefore do not have sufficient surgical experience to manage this disease.

In conclusion, our study indicates that early EOC had an incomplete staging assessment and advanced EOC, an insufficient rate of radical surgery. Reasons for these deficiencies include 1) most surgeons do not have the possibility to obtain frozen sections and diagnose the malignancy during surgery; and 2) many surgeons are not trained to perform such extended surgery. We have no proof that centralization of treatment would improve the quality of life and survival of these women, but there is now evidence that a critical number of patients is needed to maintain a multidisciplinary team and an acceptable practice in the management of ovarian cancer. We believe our results support the view that all patients with a suspicion of ovarian cancer should be centralized in specialized gynecological oncology units. For this, we suggest the use of a "risk of malignancy" index to triage patients with adnexal masses between local community hospital and referral oncological center [32]. The Swiss Society of Gynecology is currently developing a special-

ized curriculum for surgical gynecological oncologists—a specialty not currently existing in Switzerland.

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