

## A study of Surgical Complexity in the Management of Epithelial Ovarian Cancer

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**Abstract:** Surgery plays a major role in ovarian cancers. Successful cytoreductive surgery is significantly associated with improved survival. As the disease load increases, the surgical complexity also increases. Complex surgical procedures require specialized training. This study aims to determine the need for complex surgical procedures in the management of epithelial ovarian cancers. A retrospective analysis of hospital records of cases of ovarian cancers, from May 2015 to June 2017 was done . 54 cases of surgically treated Epithelial Ovarian Cancers were taken for final analysis .Interval cytoreduction was the most common surgical procedure performed , accounting for 75.9% of cases. Optimal cytoreduction , defined as less than 1 cm residual disease , was achieved in 77.7% of cases. Routine surgery , defined as Type I hysterectomy, BSO, Omentectomy, Pelvic lymphadenectomy , Para aortic nodal sampling and peritoneal biopsies was done in one third of the cases. Additional surgical procedures were needed in 66.6% of cases. Extensive radical surgical procedures were necessary in 33.3% of cases. Thus, ovarian cancer requires complex surgery in two thirds of the cases . Hence, surgical management of suspected and proven ovarian cancers are to be undertaken only in high volume centers and are to be performed only by qualified and trained surgeons

**Keywords:** Complex Surgery, Interval cytoreduction, Optimal debulking, Ovarian cancer

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### I. Introduction

Ovarian cancer is the eighth most frequent cancer in women and is the most lethal gynecologic malignancy worldwide. The majority of ovarian cancer patients present at the advanced stage. Primary cytoreductive surgery and adjuvant platinum and taxane based combination chemotherapy or Neoadjuvant chemotherapy followed by Interval cytoreductive surgery are the standard treatments for advanced ovarian cancer. A number of studies have consistently shown that successful cytoreductive surgery and the resultant minimal residual disease are significantly associated with improved survival in patients with ovarian cancer. Surgery plays a major role in the management of Epithelial Ovarian Cancers. The Objectives for surgery are, diagnosis, staging, cytoreduction and palliation. Ovarian cancers are staged surgically and an apparent Stage I tumor can be upstaged to Stage III in 30% of the cases.[1] Secondly, in the presence of extraovarian disease , maximal cytoreduction has a survival advantage.[2]. The main goal of cytoreductive surgery is to resect all visible tumor. Surgical cytoreduction for ovarian cancer typically includes the performance of a total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy and resection of all metastatic lesions. However, advanced ovarian cancer often results in a tumor mass involving both adnexae, the uterus, rectosigmoid, cecum, ileum and bladder .In addition , there may be omental caking and disease involving peritoneal surfaces, liver, spleen , lesser sac and paraaortic and pelvic nodes. In general, every effort should be made to remove as much tumor as possible, since survival correlates inversely with extent of residual disease. As the disease load increases, the surgical complexity also increases. Complex surgical procedures require specialized training and cannot be performed by surgeons who lack such exposure. This study aims to determine the need for complex surgical procedures in the management of epithelial ovarian cancers.

### II. Aim Of Study

This study aims to determine the need for complex surgical procedures in the management of epithelial ovarian cancers.

### **III. Materials And Methods**

This study was a retrospective study conducted at the Department of Surgical Oncology, Tamilnadu Government Multispeciality hospital, Omandurar. The hospital records of ovarian masses between May 2015 and June 2017 were retrieved. From these, patients who had benign pathology and non epithelial ovarian malignancies on final histopathology were excluded from analysis. Only histologically proven epithelial ovarian cancers were included for the study.

It is to be noted that, all the surgical procedures were performed by qualified Surgical Oncologists.

The following data were retrieved for analysis. The age of the patient, type of surgical procedure, whether it was staging laparotomy with primary cytoreduction or interval cytoreduction or secondary cytoreduction. The outcomes of the procedures, whether it was inoperable / suboptimal cytoreduction or optimal cytoreduction performed were noted. For the purpose of study, Optimal cytoreduction was defined as, less than 1 cm residual tumor size, at the end of surgery. Detailed analysis of the intraoperative surgical procedures was done to assess the complexity of the surgery. Type I hysterectomy with BSO, Omentectomy, Pelvic and para aortic lymph node sampling and peritoneal sampling, appendectomy were considered as routine surgical procedures in carcinoma ovary. Those cases which additionally required Small bowel release, Rectum release, Appendix and caecum release, Bowel resection, Ureteric dissection, Retrograde hysterectomy, Pelvic peritonectomy, Paraaortic lymphadenectomy, Diaphragmatic stripping, partial cystectomy and splenectomy were analysed. Those patients who required multiple combinations of the additional procedures were also noted. The final histopathologies of the patients were also analyzed.

The additional procedures mentioned add to the complexity of the surgical procedure. The actual percentage of cases requiring such additional procedures were calculated to decipher the surgical skill warranted in managing these patients.

### **IV. Results**

The records of 73 cases of Ovarian masses who had undergone surgery, were retrieved. Of these 19 cases were excluded since they were benign or non epithelial on final histopathology. 54 cases of surgically treated Epithelial Ovarian Cancers were taken for final analysis. The most common age group was 51 to 60 years contributing to 40.7% of cases, followed by 41 to 50 years, accounting for 27.7% of cases. [TABLE 1] The most common pathology was Serous papillary cystadenocarcinoma, accounting for 55.5% (30 cases). The other pathologies were Endometrioid carcinoma 18.5% (10 cases), Poorly differentiated carcinoma in 14.8% (8 cases), Mucinous adenocarcinoma in 5.5% (3 cases) and Borderline mucinous tumor in 5.5% (3 cases). The most common surgical procedure done was Interval cytoreduction, accounting for 75.9% (41 cases). Staging Laparotomy and primary cytoreduction was done in 22.2% (12 cases) and Secondary cytoreduction for 1 case. 14.8% of cases (8 cases) were inoperable. The most common reason for inoperability was extensive upper abdominal disease and extensive peritoneal disease. Optimal cytoreduction was achievable in 77.7% of cases (42 cases). In 4 cases, a suboptimal cytoreduction was performed.

The 42 cases who underwent Optimal Cytoreduction were taken for analysis of complexity of surgical procedures necessary. Routine Surgical procedures (Combinations of Procedures including Type I hysterectomy with bilateral salpingoophorectomy, Omentectomy, Pelvic Lymphadenectomy, Paraaortic nodal sampling and peritoneal sampling, appendectomy) was done in 33.3% (14/42 cases), Additional surgical procedures were needed in 66.6% of cases.

The most common additional surgical procedure necessary was Ureteric dissection after creation of para rectal space in 35.7% of cases (15 cases) Release of Sigmoid and Rectum by sharp dissection from the mass was necessary in 30.9% (13 cases). The other surgical procedures done were Small bowel release in 7% (3 cases), Caecum release and appendectomy in 14.2% (6 cases), Bowel resection and anastomosis in 4.7% (2 cases), Mesocolon resection in 4.7% (2 cases), Diaphragmatic stripping in 2.3% (1 case), Pelvic peritonectomy in 19% (8 cases), Retrograde hysterectomy in 9.5% (4 cases), Complete para aortic lymphadenectomy in 2.3% (1 case) [TABLE II] Multiple complex procedures were needed in the same patient in 33.3% (14 cases). The two most common additional surgical procedures necessary in addition to routine surgery were Release of sigmoid and rectum and ureteric dissection.

**Table I**

Age group	Number
< 30 years	2
31 to 40 years	4
41 to 50 years	15
51 to 60 years	22
61 to 70 years	8
71	3
<b>Total</b>	<b>54</b>

S. No	Surgical Procedure	Number	Percentage
1	Sigmoid and Rectum release	13	30.9%
2	Small Bowel release	3	7%
3	Caecum and appendix release	6	14.2%
4	Ureteric dissection	15	35.7%
5	Diaphragmatic stripping	1	2.3%
6	Mesocolon resection	2	4.7%
7	Bowel resection and anastomosis	2	4.7%
8	Pelvic peritonectomy	8	19%
9	Retrograde hysterectomy	4	9.5%
10	Complete Paraaortic lymphadenectomy	1	2.3%

## V. Discussion

In our study, 19 cases were excluded for final analysis since their final histopathologies were benign or non epithelial. The relative proportion of benign cases is less in our study. This can be explained by the fact that our institution is a referral oncology center and only cases of suspected or proven ovarian malignancies are referred to us. The obvious benign lesions are managed in the respective gynaecology units. The age-specific incidence rate for ovarian cancer revealed that the disease increases from 35 years of age and reaches a peak between the ages 55 and 64.[3] . The Median age of diagnosis of Epithelial Ovarian Cancer is 55 years [ 4 ] This is in concordance with our study , where 40% of cases belonged to the 51 to 60 year age group.

The most common histopathological type of Epithelial ovarian cancer is Serous papillary cystadenocarcinoma, followed by endometrioid and mucinous carcinomas. [ 4 ][5] .In our study also ,Serous cystadenocarcinoma accounted for 55% of cases. Endometrioid carcinoma accounted for 19% and mucinous carcinoma 5.5% of cases.

Interval cytoreduction was the most common surgical procedure performed. It is a known fact that epithelial ovarian cancers present at an advanced stage and neoadjuvant chemotherapy improves operability rates[6] .Hence, when patients presented with large tumor burden or poor performance status , a decision to neoadjuvant chemotherapy and reassessment after three cycles is a routine policy at our department. This accounted for Interval cytoreductive surgery being the most common surgical procedure performed .

Optimal cytoreduction , with a definition of residual tumor size less than 1 cm, was achievable in 77.7% of cases. This is similar to the optimal cytoreduction rates of 80% following neoadjuvant chemotherapy of the EORTC trial [6] and 73% optimal cytoreduction rates of the CHORUS trial [ 7] But this rate falls down to 25% when the surgeries were performed by non specialists [8]Optimal cytoreduction is more achievable when the surgery is performed by trained gynaec oncologists. [ 9, 10,11 ]. In our institution , all the procedures are performed by qualified surgical oncologists .In our study, Routine surgery was applicable only in one third of cases ( 33.3 % ). In 73.8% additional advanced surgical procedures were necessary .In one third of patients ( 33.3% ), highly complex surgeries were necessary .This is similar to studies of surgical management of ovarian cancer , where complex surgeries were needed in more than 50% of cases.[ 12,13 ]There is strong literature evidence to support the fact that implementing aggressive surgical approach is associated with a significant increase in the complete debulking rate and improved OS in patients with advanced ovarian cancer.[ 14, 15 ]The volume of residual disease and the performance of radical surgery were found to be independent factors affecting survival outcome after controlling for other factors [ 16,17]Most evidence suggests that advanced ovarian cancer patients treated at the high-volume ovarian cancer hospitals and by high-volume surgeons have better outcomes than those treated at the low-volume hospitals and by low-volume surgeons[ 18-23 ]This study implies complex surgical procedures are necessary in the surgical management of epithelial ovarian cancers in more than 70% of cases. Since aggressive surgical approach has been consistently proven to improve survival in

ovarian cancer, it is suggested that these patients be operated only by trained surgeons and at high volume centers.

## VI. Conclusion

Complex and radical surgical procedures are necessary in the management of epithelial ovarian cancers in two thirds of the patients. Maximal and complete cytoreduction are independent prognostic factors in ovarian cancers and they directly improve the overall and progression free survival. Hence, surgical management of suspected and proven ovarian cancers are to be undertaken only in high volume centers and are to be performed only by qualified and trained surgeons, to offer the best opportunity for achieving extended survival in women with advanced ovarian cancer..

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