

PERIOPERATIVE OUTCOME IN GYNECOLOGICAL ONCOLOGY SURGERIES: A SINGLE CENTRE STUDY

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ABSTRACT

Background

Gynaecological cancers constitute a major cancer burden globally. So the service demand in gynaecology oncology is increasing day by day. The gynecological cancers where surgical intervention may be needed are cervical, uterine or endometrial, ovarian, vulvar, and vaginal cancers and the procedures may range from staging, debulking surgeries involving multiple visceral organs resections, total/radical hysterectomy, lymphadenectomy, vulvectomy and vaginectomy. Due to the complexity of these surgeries and patient-related factors, complications are common. This study evaluates intraoperative and postoperative complications in gynecological cancer surgeries at Purbanchal Cancer Hospital, Birtamode.

Methods

This prospective study was conducted in the Department of Gynecology Oncology at Purbanchal Cancer Hospital from July 2023 to January 2025. A total of 70 patients diagnosed with or suspected of having gynecological cancer were included. Data were collected from the hospital electronic medical records regarding patients profile, surgery type, operative time, intraoperative events, blood loss, complications, and hospital stay. The primary outcomes were intraoperative and postoperative morbidity, measured through the Clavien-Dindo classification of surgical complications. The secondary outcome were patient profile, average hospital stay and blood loss.

Results:

Among the 70 surgeries performed, the most common were staging laparotomies (34), debulking surgeries (17), and radical hysterectomies (11). The average patient age was 51-60 years, with 88% being parous and 60% menopausal. The mean operative time was 270 minutes, with majority (38.5%) of patients experiencing blood loss between 200-300 ml. Clavin Dindo scoring for surgical complications stratification was done and 68% of the patients had CD score 1 followed by CD 2 which constituted 32%. Intraoperative complications included bowel injury (7.1%), bladder injury (5.5%), and vessel injury (1.3%). Postoperative complications included urinary tract infections (5.5%), paralytic ileus (2.6%), chest infections (4.2%), chyluria (1.3%) and secondary haemorrhage (1.3%). The average hospital stay was 8 days.

Conclusion:

Gynecological oncology surgeries are complex, with notable intraoperative and postoperative complications. Multidisciplinary care, prehabilitation, and proper postoperative management are essential in reducing morbidity and improving outcomes. The surgical complication rates in this study are consistent with similar large studies.

Keywords: *Gynecological cancers, gynecological oncology surgeries, surgical outcomes, intraoperative complications, postoperative complications.*



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INTRODUCTION

Gynaecological cancers constitute a major cancer burden globally. In 2022, gynaecological cancers accounted for 1,473,427 new cases and 680 372 deaths worldwide [1]. GCs include vulvar cancer, vaginal cancer, cervical cancer, uterine cancer, ovarian cancer, and fallopian tube cancer depending on the location of the tumour. Endometrial cancer, ovarian cancer, and cervical cancer represent the highly occurring cancers and account for more than one-third of the newly diagnosed cancers globally in females [2]. In Nepal, the most common cancer in female is breast cancer followed by cervix uteri [3]. There are various modalities of treatment for each GCs that includes surgery, chemotherapy, radiotherapy and immunotherapy. Surgical modality is one of the important modality of treatment and the procedures may range from staging, debulking surgeries involving multiple visceral organs resections, total/radical hysterectomy, unilateral/bilateral salpingo-oophorectomy, omentectomy, lymphadenectomy (pelvic, para aortic and inguinal), vulvectomy and vaginectomy. All surgical procedures are associated with certain risks. Complications can be anaesthesia related, medical or surgical and it depends upon the general condition of the patient, the diagnosis and any previous treatment (chemotherapy or any past surgeries). The adjacent structures to the uterus like ureters, bowel, urinary bladder, vessels and nerves are prone to injury during gynaecological surgery. Due to the extensive surgical procedure, distorted anatomy and also patient related factors in a cancer patient, surgical complications are common in gynaecological cancers surgery. We conducted this study to evaluate the intraoperative and postoperative complications of gynaecological cancer surgeries at Purbanchal cancer hospital. A standardized scoring system (Clavien Dindo scale of surgical complications) was applied to assess perioperative complications. This scoring system is based on the type of therapy needed to correct the complication. The scale consists of several grades (Grade I, II, IIIa, IIIb, IVa, IVb and V).

METHODS

It is a prospective study conducted in the Department of Gynecology Oncology in Purbanchal Cancer Hospital, Birtamode from July 2023 to January 2025 after ethical approval from IRC. In total, 70 patients were included in the study. All patients with diagnosed or suspected gynaecological cancer were included in the study. Data regarding the patients, operative time, intraoperative critical events, blood loss, total hospital stay, post operative complications were retrieved from the hospital electronic medical record (EMR). The postoperative complications were graded according to the Clavien–Dindo classification (CDC).

RESULTS

Table 1: Different types of gynaecological oncology surgeries

Total surgery	Number	Percentage
Staging laparotomy	34	49
Debulking Surgery	17	24.5
Open and close	2	2.7
Radical Hysterectomy BPLND	11	15.5
MIS/Open surgery for Ca endometrium	5	7
MRV with b/I ILND	1	1.3
Total	70	100%

In total 70 patients were included in the study. As shown in Table 1, among them 49% were staging laparotomy, 24.5% were debulking surgery, 2.7% were open and close, 15.5% were radical hysterectomy, 7% were staging surgery for endometrial carcinoma, 1.3% was modified radical vulvectomy with bilateral inguinal lymph node dissection. Figure 1 shows the number and percentage of various surgeries.

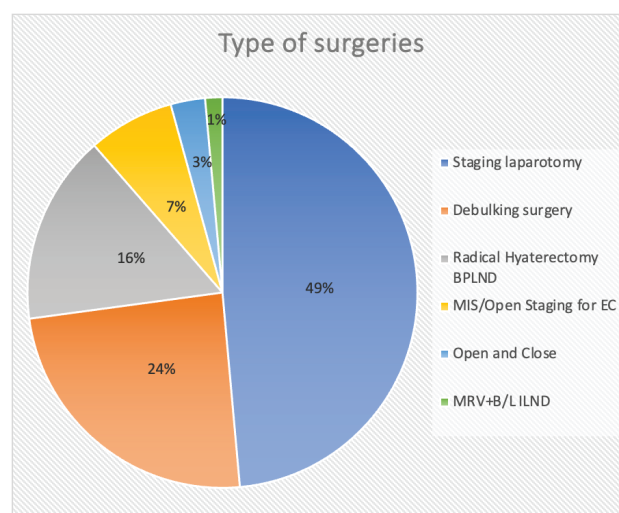


Figure 1: Different types of gynaecological oncology surgeries

Table 2: Gynaecological oncology surgeries in different age group

Age group	Number	Percentage
11-20	1	1.3
21-30	6	8.5
31-40	9	13
41-50	18	26
51-60	21	30
61-70	13	18.5
71-80	2	2.7

Table 2 shows different age group of females undergoing gynaecological oncology surgeries. Majority(30%) of the patients were in the age group 51-60years, followed by age group 41-50(26%), 61-70(18.5%), 31-40(13%), 21-30(8.5%), 71-80(2.7%), 11-20(1.3%).

Table 3: Various types of gynaecological oncology surgeries in different age group

Age group	Staging Laparotomy(n)	Debulking surgery (n)	Open and close(n)	Radical Hysterectomy(n)	Staging for endometrial cancer(n)	MRV ILND(n)	Total
11-20	1	-	-	-	-	-	1
21-30	4	-	-	2	-	-	6
31-40	4	4	-	1	-	-	9
41-50	6	6	1	2	2	1	18
51-60	9	5	-	5	2	-	21
61-70	9	1	1	1	1	-	13
70-80	1	1	-	-	-	-	2

Table 3 demonstrates the various types of gynaecological oncology surgeries in different age group. The most common age group to undergo gynaecological oncology surgeries were 51-60 years. Among them 9(42.86%) underwent staging laparotomy, 5(23.8%) underwent debulking surgery, 5(23.8%) had radical hysterectomy and 2(9.52%) had staging surgery for endometrial cancer.

Table 4: Parity of the patients undergoing gynaecological oncology surgeries

Parity	Staging Laparotomy, n (%)	Debulking surgery, n (%)	Open and Close, n (%)	Radical Hysterectomy, n (%)	Staging for endometrial cancer, n (%)	MRV ILND, n (%)	Total, n (%)
Nulligravida	6(75)	1(12.5)	-	-	1(12.5)	-	8(11.43)
Parous	28(45.17)	16(25.8)	2(3.23)	11(17.75)	4(6.45)	1(1.62)	62(88.58)

Above table 4 demonstrates that majority (88.58%) of the patients undergoing gynaecological oncology surgeries were parous and 11.43% of patients were nulligravida. Among parous ladies 45.17% had undergone staging laparotomy, 25.8% underwent debulking surgery, 17.75% underwent radical hysterectomy, 6.45% underwent staging surgery for endometrial cancer, 3.23% were opened and closed and 1.62% of the parous patient had modified radical vulvectomy with inguinal lymph node dissection.

Table 5: Reproductive status of patients

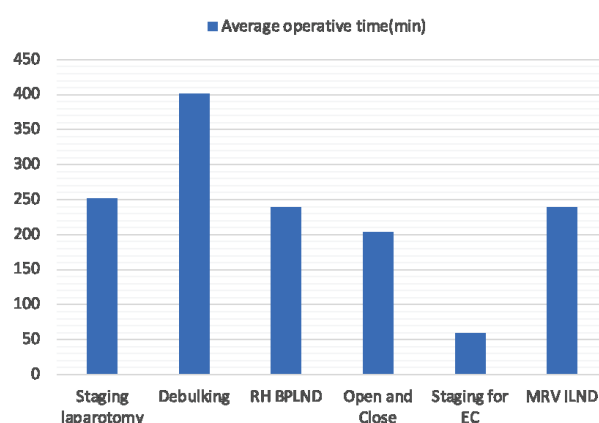
Reproductive status	Number(n)	Percentage (%)
Reproductive	28	40
Menopause	41	60

Table 5 shows the reproductive status of the patients undergoing gynaecological oncology surgeries. It shows that 60% of the patients already attended menopause and 40 % were in reproductive status.

Table 6: Operative time of various surgeries

Gynaeco Surgeries	Average operative time(min)
Staging laparotomy	252
Debulking surgery	402
Radical hysterectomy	240
Open and Close	60
Staging for endometrial cancer	204
MRV ILND	240

Table 6 shows the operative time in minutes for the different surgeries. The maximum time was 402 minutes which was for debulking surgery done for ovarian carcinoma. The operative time was 252 minutes for staging laparotomy, 240 minutes for radical hysterectomy and modified radical vulvectomy with inguinal lymph node dissection, 204 minutes for staging surgery for endometrial cancer and 60 minutes for open and close. The mean operative time was 233mins. Figure 2 shows the average operative time for the various gynaecological oncology surgeries.

Average operative time(min)**Figure 2: Operative time for various surgeries****Table 7: Average Blood loss for different surgeries**

Blood loss in ML	Staging laparotomy	Debulking surgery	Open and Close	RH	Ca endo Sx	MRV	Total
50-100	2	-	-	-	-	-	2
101-200	5	2	2	3	2	-	14
201-300	15	8	-	4	-	-	27
301-400	6	4	-	3	1	1	15
401-500	-	2	-	1	1	-	4
501-600	2	3	-	1	-	-	6
601-700	1	-	-	-	-	-	1
701-800	-	-	-	-	-	-	-
801-900	-	-	-	-	-	-	-
>1000	1	-	-	-	-	-	1

Table 7 shows the blood loss in millilitres in various surgeries. Most of the surgeries had blood loss between 200-300ml, 15 patients of staging laparotomy, 8 patients of debulking surgery, 4 patients of radical hysterectomy. One patient had blood loss more than 1 litre which was done for a large abdominopelvic mass with pregnancy.

Table 8: Intraoperative blood transfusion in various surgeries

Surgery	Staging Laparotomy, n (%)	Debulking surgery, n (%)	RH BPLND, n (%)	Staging surgery for EC, n (%)	MRV ILND	Open and close	Total, n (%)
Number of patients	4(20)	10(50)	4(20)	2(10)	-	-	20(28.5)

Table 8 shows the number and percentage of intraoperative blood transfusion in various surgeries. It showed that 50% of the patient who underwent debulking surgery required intraoperative blood transfusion which was followed by staging laparotomy (20%), radical hysterectomy (20%) and staging surgery for endometrial cancer. 28.5% of the patients received intra operative blood.

Table 9: Postoperative blood transfusion in various surgeries

Surgery	Staging Laparotomy, n (%)	Debulking surgery, n (%)	RH BPLN, n (%)	Staging surgery for EC, n (%)	MRV ILND	Open and close	Total, n (%)
Number of patients	2(28.5)	4(57)	-	1(14.5)	-	-	7(10)

Table 9 shows the number and percentage of the patient who had received postoperative blood transfusion. Among those who received postoperative blood transfusion 57% had debulking surgery. 28.5% had staging laparotomy and 14.5 % had staging surgery for endometrial cancer. 10% of the patient had post operative blood transfusion.

Table 10: Average hospital stay for the different surgeries

Type of surgery	Staging Laparotomy	Debulking surgery	Open and Close	Radical hysterectomy	Staging surgery for endometrial cancer	MRV ILND	Average hospital stay(days)
Average Hospital Stay	7	10	6	9	5	7	8

Table 10 shows the average hospital stay for the different surgeries. It was maximum for debulking surgery which was 10 days, 9 days for radical hysterectomy, 5 days for staging surgery for endometrial cancer, 7 days for modified radical vulvectomy with inguinal lymph node dissection. The average hospital stay was 8 days. There was one readmission within 30 days of surgery which was on 7th postoperative day following total laparoscopic hysterectomy with bilateral salpingo-oophorectomy with bilateral pelvic lymph node dissection done for endometrial carcinoma. There were no mortality within 30 days of the surgery.

Table 11: Intraoperative Complications

Complications	Number	Percentage
Primary haemorrhage	1	1.3
Bladder Injury	4	5.5
Bowel Injury	2	2.6
Vessel injury(Ext Iliac Vein)	1	1.3

Table 11 shows the percentage of intraoperative complications. The most common was bladder injury

(5.5%), then bowel injury (2.6%) followed by primary haemorrhage (1.3%) and vessel injury (1.3%).

Table 12: Postoperative Complications

Post op complication	Number	Percentage
Urinary tract infection	4	5.5
Paralytic ileus	2	2.6
Chest Infection	3	4.2
Wound Infection	3	4.2
Chyluria	1	1.3
Secondary haemorrhage	1	1.3

Table 12 shows the percentage of postoperative complication. The most common was urinary tract infection (5.5%). Other complications were chest infection (4.2%), wound infection (4.2%), paralytic ileus (2.6%), chyluria (1.3%) and secondary haemorrhage (1.3%)

Table 13: Clavin- Dindo scoring in this study

CD score	Number	Percentage
CD 1	48	68
CD 2	22	32
CD 3	-	-
CD 4	-	-

Table 14: Clavien- Dindo scoring for different surgeries

	Staging laparotomy	Debulking surgery	Open and close	Radical hysterectomy	Staging surgery for endometrial surgery	MRV ILND	Total
CD1	25	7	2	9	4	1	48
CD2	9	10	-	2	1	-	22
CD3	-	-	-	-	-	-	-
CD4	-	-	-	-	-	-	-

Table 13 shows the clavien-dindo scoring in this study. Clavien-dindo scoring for surgical complications stratification was done and 68% of the patients had CD score 1 followed by CD 2 which constituted 32%. Table 14 shows that 25 patients with staging laparotomy, 7 with debulking surgery, 2 with open and close, 9 with radical hysterectomy, 4 with staging surgery for endometrial cancer and 1 with MRV ILND had CD score 1. 9 patients with staging laparotomy, 10 patients with debulking surgery, 2 patients with radical hysterectomy, 1 patient with staging surgery for endometrial cancer had CD score 2. This is also illustrated in figure 3. None of the patients had CD score 3 and 4.

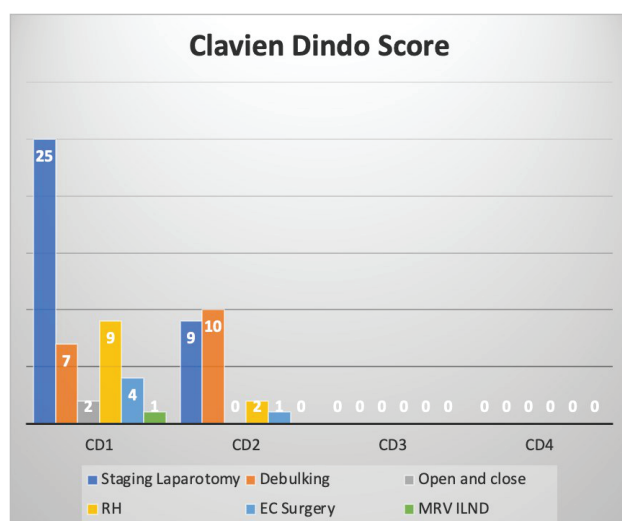


Figure 3: Clavien-Dindo scoring

DISCUSSION

In our study, all major gynaecological oncological surgeries were included. Among them, staging laparotomy which was done for a suspected adnexal mass was the common surgery that constituted 49% of the total surgeries. Overall, the intraoperative and postoperative complications rate was 34%. The average duration of hospital stay was 8 days. The average longest hospital stay was after debulking surgery done for ovarian cancer which was 10 days followed by radical hysterectomy (9days). Total 20 patient received intra operative blood transfusion, out of which 10 patients were patients who underwent debulking surgery. Out of 7 patients who received post operative blood transfusion 4 were patients who had debulking surgery. In this study the majority of the patient (68%) had CD score 1 followed by CD 2 which constituted 32%. 17 patient had CD score 2, out of these 10 patients underwent debulking surgery. Compared to study done by Charlotte et al. CD I-IV was registered in 29% and CD > III in 11% [4]. This shows that the surgical complications in this study was less. Among all surgeries, debulking surgery for ovarian cancer is the most complex gynaecological surgery which involves removal of as much tumor tissue as possible. And it is shown in many studies that maximal cytoreduction improves the survival outcome of the patient [5]. In this study the mean operative time for debulking surgery was 402minutes and 87% of the patient achieved complete cytoreduction which is comparable to such similar study. Mohamed A. Mlees et al evaluated impact on patient's survival after interval debulking surgery following neoadjuvant chemotherapy for advanced ovarian carcinoma, where the complete cytoreduction was achieved in 54.2% and optimal debulking 45.8% [6]. Similarly in a study conducted by Philippe Morice et al complete resection was observed in 51% (29 of 57) of patients in the IDS group [7]. In this study the

most common intraoperative complication was bowel injury which was 7.1% followed by bladder injury (5.5%) and vessel injury (1.3%). Bowel injury is a common complication in gynaecology oncological surgeries. It can occur during initial surgical access, during bowel handling and removal of the adnexal mass. This can land up to bowel resection and anastomosis and even creating a stoma for diversion or simply repair of the injured part. Timely recognition of such complications can prevent the future chances of bowel leak, fistula formation increasing the morbidity and mortality rate of the patient. Purwoto G et al studied the complications of ovarian cancer surgery in 78 patients. The most prevalent was bowel injury (12.8%) followed by bladder injury (2.6%) and ureter injury (1.3%) [8]. Majority (54%) of iatrogenic ureter injury occurs during hysterectomy followed by colorectal surgery (14%), pelvic procedures such as ovarian tumor removal (8%), transabdominal urethropepy (8%), and abdominal vascular surgery (6%) [9]. In this study the incidence of bladder injury was 5.5%(N-4), there was no ureteral injury. The injury also depends upon the types of surgery. A review of several studies across gynecological cancer types found urinary system complications in 1.9% of robotic-assisted surgeries, 4.7% of laparoscopic surgeries and 3.3% of abdominal cases [10]. Lymphadenectomy plays an essential role in the staging protocols for gynecological cancers and this is done in almost all gynaecological cancer. It can cause postoperative complications like lymphocele, lymphedema and ascites. Lymphoceles are a reported complication in 1–50% of gynecological surgeries. They generally appear 7–15 days postoperatively and most resolve spontaneously [11,12]. Thitima et al. has studied the overall complications following pelvic and paraaortic lymphadenopathy in 399 patients with cervical, endometrial and ovarian cancer. It showed that the overall complication rate was 42.4%, with intra-operative, acute postoperative, and long-term rates of 26.1%, 11.0%, and 14.0%, respectively [13]. In this study almost all patients underwent lymphadenectomy or lymph node sampling and one patient had external iliac artery injury intra operatively and one patient had chyluria. Any kind of postoperative infection (urinary tract infection, wound infection, chest infection) have shown to decrease response to chemotherapy, leading to a shorter progression-free survival in ovarian cancer (median time: 8.4 vs 17.6 months in infected vs not infected in postoperative period, respectively; $p=0.001$) [14]. Among all infections, urinary tract infection have been shown to complicate a third of the surgeries [15]. In our study the urinary tract infection rate was 5.5%. Wound infection is also common after gynaecologic cancer surgeries (5-35%) [16] but its rate is decreased after prophylactic use of antibiotics

[17]. In this study the wound infection rate was 4.2% which is a better result than other similar studies. In a Study done by O'Donnell RL et al in 339 women who underwent laparotomy for suspected gynaecological cancer showed an SSI rate of 16% [18]. In another study done by Nugent EK et al the wound complications after gynaecologic surgeries was evaluated and it occurred in 34% of the patients [19]. Intraoperative bowel injury, small bowel obstruction and ileus each complicate approximately 2% of all gynaecological cancer surgeries but are significantly more common in open surgery compared with minimally invasive approaches [20-22]. Ileus is the most common cause of readmission after a gynaecological cancer surgery [23-25]. In our study the rate of bowel injury was 2.6% and paralytic ileus was 2.6%. In a study done in 240 patients undergoing gynaecological cancer surgeries the incidence of postoperative ileus was found to be 11.3% [26].

CONCLUSION

Gynecological oncology surgeries are complex with notable intraoperative and postoperative complications. Documenting each and every complication following gynaecological oncological surgeries helps show the quality of surgery and helps in the surgical care of the patient in future. Multidisciplinary care, prehabilitation, and proper postoperative management are essential in reducing morbidity and improving outcomes. The surgical complication rates in this study are consistent with similar large studies.

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