SRYAHWA PUBLICATIONS

Open Journal of Surgery
ISSN: 2639-3611 | Volume 7, Issue 1, 2026
https://doi.org/10.22259/2639-3611.0701003

RESEARCH ARTICLE

Epidemiological, Clinical, and Surgical Outcomes of Laparoscopic Surgery for Postoperative Adhesions : A Retrospective Study at Panzi General Reference Hospital

MANDA KISIMBA Emmanuel[1], Glory to God BYABENE KADUKU[2], KIBONGE MUKAKALA Augustin[3], WAKUNGA UNEN Eric[1], RAHA MAROY Kenny[4], MUKANIRE NTAKWINJA[4], ARUNG KALAU Willy[1], MUKENGERE MUKWEGE Denis[4]

[1] Department of Surgery, Lubumbashi University Clinics, Faculty of Medicine, University of Lubumbashi, Haut Katanga Province, Democratic Republic of Congo.

[2] Digestive Surgery Unit, Department of Surgery, Panzi General Reference Hospital, Evangelical University in Africa, South Kivu Province.

[3]Department of Surgery, Bukavu University Clinics, Faculty of Medicine, Official University of Bukavu.

[4]Gynecology and Obstetrics Department, Panzi General Reference Hospital, Evangelical University in Africa, South Kivu Province.

Received: 03 February 2026 Accepted: 20 Febuary 2026 Published: 06 March 2026

Corresponding Author: MANDA KISIMBA Emmanuel, Department of Surgery, Lubumbashi University Clinics, Faculty of Medicine, University of Lubumbashi, Haut Katanga Province, Democratic Republic of Congo.

Abstract

Introduction: Peritoneal adhesions represent a major clinical challenge in digestive surgery and are currently the most common complication of abdominal surgery and one of the biggest unresolved problems in colorectal surgery to date.

Methodology: This is a descriptive study with retrospective data collection on postoperative adhesions observed in patients who underwent laparoscopic surgery between January 1, 2023, and August 31, 2024, at the Panzi General Reference Hospital in North Kivu, Democratic Republic of Congo.

Results: Adhesions were observed in 73 of the 103 patients with a history of laparotomy who underwent laparoscopic surgery, representing a frequency of 70.87%. The median age was 42 years. The sex ratio was 11.1, with a predominance of females. 79.45% of patients had one to three previous surgeries in their history. Cesarean section, laparotomy, and appendectomy were the most frequently cited previous surgeries. The most common indications were infertility and lithiasiccholecystitis. The intraoperative findings revealed the presence of lithiasiccholecystitis and uterine fibroids. The most common types of adhesions were adhesions between the omentum and the wall. Adhesiolysis was performed in 91.78% of cases. The median operating time was 92.5 minutes, ranging from 25 to 165 minutes. The conversion rate was 1.37%. In 90.41% of cases, no intraoperative incidents were reported.

Conclusion: Postoperative adhesions remain common in our setting. They generally require intraoperative adhesiolysis. The conversion rate is low and acceptable. Laparoscopic management reduces postoperative morbidity. Widespread use of minimally invasive surgery will reduce the occurrence of adhesions in surgery.

Keywords: Laparoscopic Surgery, Postoperative Adhesions.

Citation: MANDA KISIMBA Emmanuel, Glory to God BYABENE KADUKU, KIBONGE MUKAKALA Augustin, *et al.* Epidemiological, Clinical, and Surgical Outcomes of Laparoscopic Surgery for Postoperative Adhesions : A Retrospective Study at Panzi General Reference Hospital. Open Journal of Surgery. 2026; 7(1): 21-27.

1. Introduction

Peritoneal adhesions are pathological connections that usually form between the omentum, small intestine, colon, abdominal wall, and other intra-abdominal organs. They represent a major clinical challenge in digestive surgery(2). Today, they are the most common complication of abdominal surgery and represent one of the biggest unresolved problems in colorectal surgery to date (3).

The prevalence of adhesions after major abdominal surgery has been estimated at between 63% and 97%(4). They are a major cause of morbidity and represent the most common cause of intestinal obstruction and secondary female infertility. (5) (6).

2. Methodology

This is a descriptive study involving the collection of retrospective data on postoperative adhesions observed in patients who underwent laparoscopic surgery between January 1, 2023, and August 31, 2024, at the Panzi General Reference Hospital in Bukavu, North Kivu, Democratic Republic of Congo. Our study included all patients with a history of laparotomy in whom laparoscopy revealed adhesions during our study period. We excluded from our study all patients with a history of laparotomy but in whom no adhesions were observed during laparoscopy. Our data were encoded in Epi Info 7.2, processed and verified in Microsoft Excel, and entered into Microsoft Word. The reference was generated by Zotero.

3. Results

3.1 Epidemiological and Clinical Aspects

During our study period, we performed 103 laparoscopies on patients with a history of laparotomy, and among them, adhesions were observed in 73 patients, representing a frequency of 70.87%.

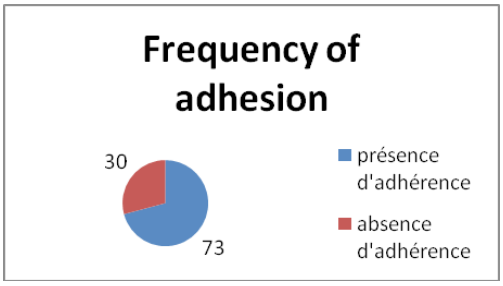

Figure 1. *Frequency of adhesion*

The age group most represented in our study is 34 to 43 years old, accounting for 24.66% of respondents, with a median age of 42 and extremes ranging from 18 to 70 years old.

Table 1. *Distribution of respondents by age group, workforce category, and corresponding percentage.*

Age groupe	Workforce	Pourcentage
18 - <26	6	8,22
26 - <34	12	16,44
34 - <42	18	24,66
42 - <50	14	19,18
50 - <58	11	15,07
58 - <66	10	13,70
66 - <70	1	1,37
70	1	1,37
TOTAL	**73**	**100,00**

The sex ratio was 11.1, meaning that 91.78% of the sample was female.79.45% of patients reported having undergone one to three previous surgeries, with a mode of two. Cesarean section, laparotomy, and appendectomy were the most frequently cited previous surgeries, at 49.32%, 41.1%, and 38.36%, respectively.

Table 2. *Distribution of clinical aspects among the workforce (n=73), expressed as percentage.*

Clinical aspects	Workforce (n=73)	Pourcentage
1° Number of previoussurgeries		
1 à 3	58	79,45

4 à 6	13	17,81
7 à 8	2	2,74
2° Types of anteriorsurgery		
césarienne	36	49,32
laparotomie	30	41,1
kystectomie ovarienne	20	27,4
appendicectomie	28	38,36
cure d'hernie	3	4,11

In terms of the type of scar observed during abdominal examination, Mac Burney scars were the most common in 38.36% of cases, followed by midline scars below and above the umbilicus in 35.62% of cases. The most common preoperative diagnoses indicating laparoscopy were infertility (31.51%), lithiasiccholecystitis (15.07%), and adhesive syndrome (15.07%).

Table 3. *Distribution of clinical aspects among the workforce , expressed as percentage.*

Clinical aspects	workforce	Pourcentage
4° types of abdominal scars		
Mac burney	28	38,36
Below and above the umbilical cord	26	35,62
Pfanentiel	22	30,14
subumbilical	18	24,66
5° Preoperative diagnostics		
infertility	23	31,51
Gallstonecholecystitis	11	15,07
adhesion syndrome/pelvic pain	11	15,07
uterinefibroid	7	9,59
Eventration	5	6,85
inguinal/umbilicalhernia	3	4,11
intestinal obstruction	2	2,74

3.2 Operative aspects

Apart from adhesions, the operative findings revealed the presence of a dilated and lithiasic gallbladder in 15.07% of cases and uterine myomas in 9.59% of cases. The most common types of adhesions were adhesions between the omentum and the wall in 39.81% of cases.

Table 4. *Distribution of operational aspects among the workforce (n=103), expressed as percentage.*

Operational aspects	Workforce (n=103)	%
1° Intraoperativefindings		
Gallbladder stones	11	15,07
Uterinefibroid	7	9,59
Ripping bag	6	8,22
Hernia point	3	4,11
Ovariancyst	3	4,11
2° Types of adhesion		
Parietalomentum	41	39,81
Inter-annexial	23	22,33
Grelo/parietal colo	22	21,36
adnexalparietal	17	16,5
Adnexal and digestif	17	16,5
Parietal and uterine	12	11,65

With regard to the most common intraoperative proceduresperformedduringlaparoscopy,adhesiolysis was performed in 91.78% of cases, cholecystectomy in 15.07%, and hysterectomy in 9.59%.

Table 5. *Operative procedures performed by the workforce (n=103), expressed as percentage.*

Operativeproceduresperformed	workforce (n=103)	Pourcentage
Adhesionremoval	67	91,78
Cholecystectomy	11	15,07
Hysterectomy	7	9,59
Herniarepair	9	12,33
Ovariancystectomy	4	5,48

In terms of operating time, 30.14% of operations lasted between 31 and 60 minutes, with a median operating time of 92.5 minutes and extremes ranging from 25 to 165 minutes. The conversion rate was 1.37%. In 90.41% of cases, no intraoperative incidents were reported.

Table 6. *Operating time (minutes), operative conversion, and operating room incidents among the workforce, expressed as percentage.*

OPERATING TIME in minutes.	workforce	%
0-30	11	15,07
31 - 60	22	30,14
61 - 90	17	23,29
91 - 120	17	23,29
121 - 150	5	6,85
151 - 165	1	1,37
OPERATIVE CONVERSION		
No	72	98,63
Yes	1	1,37
OPERATING ROOM INCIDENTS		
None	66	90,41
Intestinal perforation	5	6,85
hemorrhage	2	2,74

4. Discussion

Postoperative adhesions are a common and often serious complication of abdominal and gynecological surgery, which can cause infertility, chronic pain, and intestinal obstruction (7).

From a pathophysiological perspective, the balance between fibrin deposition and degradation is crucial in determining normal peritoneal healing or the formation of adhesions. If fibrin is completely degraded, normal peritoneal healing can occur. In contrast, incompletely degraded fibrin can serve as a scaffold for fibroblasts and growing capillaries to form peritoneal adhesions(2).

From an epidemiological and clinical perspective: 70.87% of the 103 patients in our study developed postoperative adhesions. This could be explained by the fact that laparotomy surgery is a major cause of postoperative adhesions (8). Our data are higher than those of James Didier L et al, who found that multiple adhesions or bands were observed in 43.07% of cases (9). In terms of gender, the sex ratio in our study is 11.1 in favor of women. This could be explained by the fact that our study combines two departments, including gynecology and obstetrics, which only concerns women, not counting patients who consulted and were treated in the surgery department.

The mode of our series of previous laparotomy surgeries is 2. Our data are higher than those of Togni R. et al (10), who report that most women had already undergone at least one previous surgery (60%), most often a cesarean section. Compared to the types of previous surgeries reported in the medical history, the most common in our study were cesarean section, laparotomy, and appendectomy. Our data are consistent with those of Akyurek N et al (11), which show that gynecological operations such as hysterectomy, oophorectomy, and cesarean section accounted for 53% of surgical history, followed by conventional appendectomy. In terms of the type of scar observed during abdominal examination, Mac Burney scars were the most common, followed by midline scars below and above the umbilicus. In fact, the most prevalent surgical histories in our study were cesarean sections, exploratory laparotomy, and appendectomy. This explains why these scars were found more frequently in our study.

The most common indications for laparoscopy are infertility, lithiasiccholecystitis, and adhesion

syndrome. Laparoscopy remains the gold standard in the management of lithiasiccholecystitis. In gynecology and obstetrics, infertility is the most common indication. This is in line with the opinion of most authors, notably Carbonnel M et al, who concluded that laparoscopy remains the gold standard for diagnostic examinations in pelvic anatomical abnormalities associated with infertility.

With regard to operative aspects, the intraoperative findings were dominated by the presence of adhesions in 70.87% of cases. This could be explained by the fact that laparotomy surgery is a major cause of postoperative adhesions and that the minimally invasive approach reduces the risk of adhesions developing and forming (8,12). Our data are higher than those of Bouasker I et al (13), who reported that adhesions were found in only 40% of patients and were considered numerous in half of the cases.

The most common types of adhesions are those between the omentum and the wall, accounting for 39.81% of cases. Our data corroborate the findings of the study on intestinal obstructions secondary to adhesions by Menzies D et al (14), which describes that the most frequently encountered adhesions are those between the omentum and the wall. However, they differ from those of Andrew I. Brlll et al (15), who report that 84.37% of adhesions were located at the level of the omentum and intestine and conclude that intra-abdominal adhesions and underlying viscera are a consequence of laparotomy.

With regard to the most common intraoperative procedures performed during laparoscopy, adhesiolysis was performed in 91.78% of cases, cholecystectomy in 15.07% and hysterectomy in 9.59%. These data can be explained by the fact that the intraoperative findings consisted largely of adhesions and that the intraoperative diagnoses were more marked by lithiasiccholecystitis and infertility.

Our data are similar to those of James Didier L et al, whose study reveals that adhesiolysis was performed in 26 patients, or 40%, which was the most frequent procedure. (9). This is lower than that reported by Akyurek N et al (11), who describe that adhesiolysis was performed in 64 of the 83 patients (77.1%) in whom adhesions were found during laparoscopic cholecystectomy.

Operating time has always been a key factor in laparoscopy. Indeed, daily practice of this surgical approach increases experience and reduces operating time compared to conventional laparotomy(16). The operating time for laparoscopy is generally slightly longer in people who have had previous surgery(17). In our study, 30.14% of operations took between 31 and 60 minutes, with a median operating time of 92.5 minutes and extremes ranging from 25 to 165 minutes. This timing can be explained by the fact that in most cases, we had to perform adhesiolysis and then the actual surgery itself.

Conversion to laparotomy should not be considered a failure or complication, but rather a recognition of the limitations imposed by technology, surgical expertise, or factors specific to a particular patient or pathological process(18). The conversion rate in our study is 1.37%. This low conversion rate can be explained by the expertise of the surgical team, which is well trained in laparoscopic surgery, facilities and equipment designed to ensure a continuous power supply, and state-of-the-art technical facilities that guarantee the practice of laparoscopic surgery.

With regard to intraoperative incidents, we note that in 90.41% of cases no intraoperative incidents were observed. Our data corroborates certain literature, notably Bouasker I et al.(13), who report that 4 out of 233 patients had incidents during surgery: namely, a small intestine wound, a bile duct wound, a gastric wound, and an unrecognized colonic wound.

Akyurek N et al(19), in their study of laparoscopic cholecystectomies in patients with a history of laparotomy, report that they encountered no intraoperative complications.

5. Conclusion

Post operative adhesions remain common in our setting. They generally require intraoperative adhesiolysis. The conversion rate is low and acceptable. Laparoscopic management reduces postoperative morbidity. Widespread use of minimally invasive surgery will reduce the occurrence of adhesions in surgery.

6. Reference

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Appendix

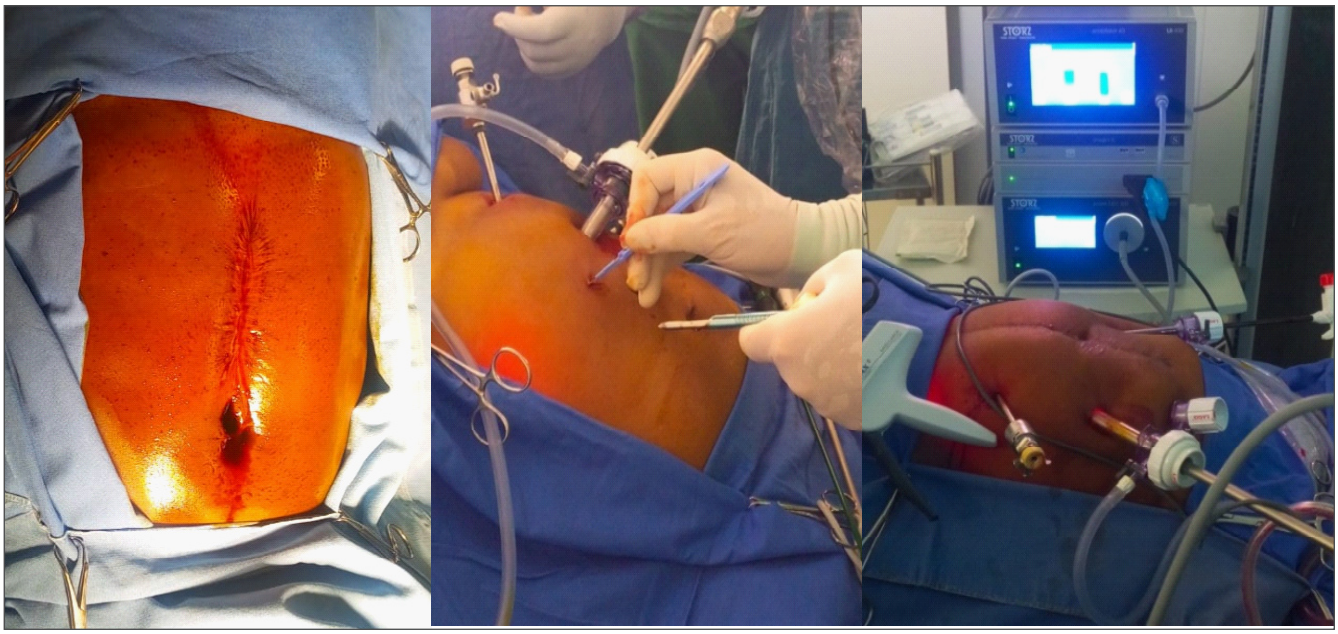

Figure 1. *Introduction and placement of trocars on a scarred abdomen*

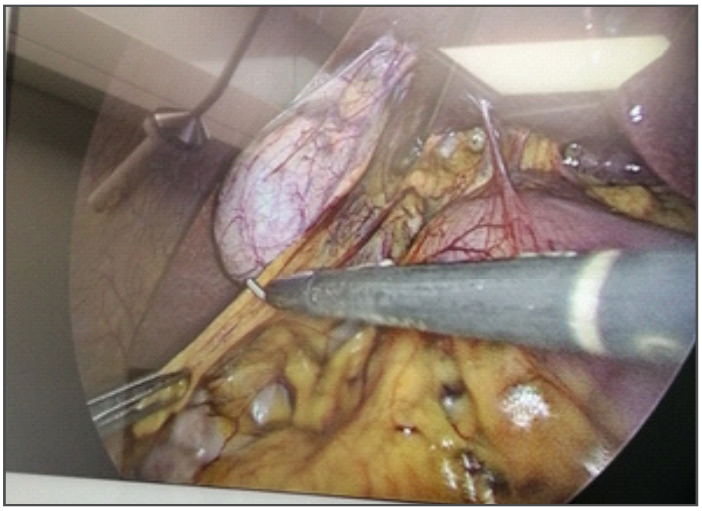

Figure 2. *Inflamed gallbladder with omental-vesicular adhesions*

Figure 3. *Epiploic-parietal and uterine-parietal adhesion*