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ORIGINAL ARTICLE

Safety of Laparoscopic Surgery in Gynecologic Emergencies: Comparative Analysis with and without Previous Abdominopelvic Surgery

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ABSTRACT

Objective: To determine the safety of laparoscopic surgery with and without history of previous abdominopelvic surgeries among women undergoing gynecological emergencies in a private tertiary care hospital of Karachi.

Methods: This analytical comparative study was conducted at Patel Hospital from Jan 2018 to Jan 2020. The study included all non-pregnant and pregnant women aged 16 years and above diagnosed with acute abdomen pain due to gynecological causes. Patients divided into two groups on the basis of their presence or absence of history of abdominopelvic surgeries. Safety was defined based on risk/frequency of organ injury, amount of blood lose, need of per-operative transfusion and surgical time. Post-operatively the safety was measure by duration of hospital stay, post operative pyrexia, and wound infection.

Results: Of 92 women, the mean age was 28.6±6.5 years. There were 36 (39.1%) women with previous abdominopelvic surgical history and 56 (60.9%) without previous abdominopelvic surgical history. No significance difference of blood loss (p-value 0.382) and duration of hospital stay (p-value 0.475) were observed in both groups. However, duration of surgery was the only variable which was found significantly different in both groups (p-value 0.018). Among 56 patients with no previous abdominopelvic surgery, pre-operative transfusion was found in 14 (25%) and post-operative pyrexia in only 2 (3.6%) patients. Whereas none of the patients in both groups reported wound infection or organ injury.

Conclusion: Laparoscopic procedures are safe to use in gynecological emergencies for both diagnostic and therapeutic purposes regardless of presence of history of abdominopelvic surgeries.

Keywords: Gynecologic, Laparoscopic, Safety, Surgeries.

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INTRODUCTION

Laparoscopy, a minimal access surgery is now the preferred mode of gynecological surgery. It fulfils both diagnostic and therapeutic purposes. This novel venture was started 25 years back and has now extended its arms to a wide range of gynecological surgical indications.[1] Gynecological emergency conditions now have emerged as a strong and valid indication for the diagnosis as well as for management. Almost all gynecological surgical procedures are performed by laparoscopy including radical hysterectomy and uterine transplant.[1] This is because of cosmetic small wounds, less pain, quicker recovery, and short hospital stay.

Laparoscopy plays an important role in emergencies where none of the confirmed diagnosis is reached even after maximum workup in patients with acute abdomen due to gynecological problems.[2] Laparoscopy has three roles: first to validate the pathophysiologic diagnosis (diagnostic laparoscopy), second to help decision making for the next step in management i.e. should the surgeon use laparoscopic assisted open approach or treat the disease fully by laparoscopic approach and finally, the surgical procedure via laparoscope in most cases. But somehow this still raises questions of safety and feasibility when compared to open laparotomy, especially in countries like ours where conventional laparoscopy has yet to become frequent and popular.[2]

One more noticeable concern about laparoscopy that has been for years is its increased risk in patients with a history of abdominopelvic surgeries.[3] This is also known now that this fits better with entry-related injuries.[4] Now when surgeons have gained years of experience and with rapid and high-tech advancements in the field, this dictum is losing its weight.[5] The common gynecological emergency conditions needing surgery include ruptured ectopic pregnancy, ovarian cyst accidents with or without pregnancy, pelvic inflammatory disease, cesarean scar pregnancy, and certain non-gynecological conditions in pregnancy like appendicitis.[2]

The rationale of our study is as laparoscopic surgery is not common in our country with the fear that this is unsafe in emergencies situation and patients with previous surgery. To support or negate this concept the study was conducted to determine the safety of laparoscopic approach in emergencies, also the establishment of its safety profile in patients with a history of abdominopelvic surgery.

METHODS

This analytical comparative study was conducted at Patel Hospital Karachi from Jan 2018 to Jan 2020. Ethical Committee of Patel Hospital Karachi had approved the study formally (PH/IRB/2018/112). Moreover, signed informed consent had been taken prior conducting the study.

The study included all non-pregnant and pregnant women aged 16 years and above diagnosed with acute abdominal pain due to gynecological causes. The patients presenting in an emergency or clinic with lower abdominal pain, with or without associated symptoms were examined and evaluated whenever needed, with trans-vaginal pelvic scan, ßhcg, urine analysis, and other specific investigations. All those found to have any surgical pathology and needed surgery on an emergency basis were included, and those with the uncertain diagnosis were included as well. The patients were categorized into groups A and B. Group A included all patients with no previous surgical history and group B included those with such history. All the patients who did not need to operate within 24 hours were excluded from the study. The term emergency denotes the admission to surgery duration to be less than 24 hours. Laparoscopy was aimed to confirm or exclude the presumptive diagnosis, diagnose a new pathology, and then to operate accordingly. The safety of any surgical procedure including laproscopic surgery Is determined by the risk/frequency of organ injury amount of blood loss, need for per-operative transfusion, and surgical time. Post-operatively the safety is measured by duration of hospital stay, post-operative pyrexia, and wound infection.

All cases were performed under general anesthesia. The port placement was almost the same for each procedure; little customization was required per each case, depending upon the site and estimated difficulty assessment. This customization was mostly in the number of ports and use of Palmers point entry in patients with previous midline scar surgery. The optical port was 10 mm supra umbilical, one 5 mm on assistant side just above the Mc Burney's point and two 5 mm on surgeon side: one little above the anterior superior iliac spine and the other in between the previous two. For ruptured ectopic pregnancy, salpingectomy was the principal procedure. Detorting and cystectomy were done for ovarian torsion. Peritoneal wash and adhesiolysis were done in acute PID cases.

Patients were observed for intraoperative blood loss, entry-related complications, organ/vascular injury, duration of surgery, need of blood transfusion, wound infection, post-operative fever, and duration of postoperative stay. The difference in pre-operative and post-operative diagnosis was also assessed.

Data entry and analysis were done using Statistical Package for Social Sciences (SPSS) version 20.0. Mean ± SD were computed for quantitative variables like age while frequency and percentages were computed for categorical variables like surgical history, histopathology, procedure of laparoscopy, blood loss, per-operative transfusion, gravida, duration of hospital stay, pre and post operative indications. Inferential statistics were explored using Chi-square/Fisher exact test to compare previous abdominopelvic surgery with baseline/clinical characteristics and safety of laparoscopy. The p-value of ≤ 0.05 was considered statistically significant.

RESULTS

Of 92 women, the mean age was 28.6 ± 6.5 years. There were 36 (39.1%) women with previous surgical history and 56 (60.9%) women without previous surgical history. The most common procedure was laparoscopic salpingectomy presented with 66 (71.7%). During laparoscopy blood loss was observed in 84 (91.3%) patients. Majority of the patients stayed in the hospital with ≤1 day 84 (91.3%).

The most common histopathology of laparoscopic patients was serious cystadenoma 64 (69.6%) followed by corpus luteal cyst 16 (17.4%), ectopic 2 (2.2%), salpingitis 2 (2.2%), cyst adenofibroma 2 (2.2%), mucinous cystadenoma 2 (2.2%), benign cystadenoma 2 (2.2%), and ovarian ectopic 2 (2.2%). (Table 1)

Previous abdominopelvic surgery was found significantly higher in age > 30 years as compared to age ≤ 30 years i.e., 20 (52.6%) vs. 16 (29.6%) (p-value 0.032). Moreover, previous abdominopelvic surgery was found significantly higher in women with second and third gravida i.e., 12 (46.2%) and 10 (62.5%) (p-value 0.012). The most common pre and post-operative indication in previous abdominopelvic surgery was ruptured ectopic i.e., 18 (34.6%) and 16 (29.6) respectively. (Table 2) Of 56 patients with no previous abdominopelvic

surgery, per-operative transfusion was found in 14 (25%) and post-operative pyrexia in only 2 (3.6%) patients. Whereas none of the patients with history of abdominal surgery required per-operative transfusion or reported post-operative pyrexia.

In addition, wound infection and organ injury were found in none of the patients. No significant difference in blood loss (p-value 0.382), and duration of hospital stay (p-value 0.475) was observed in both groups. While, the duration of surgery was the only variable which was found significantly different in both groups (p-value 0.018). (Table 3)

Table 1: Histopathology of laparoscopic patients (n= 92)

	n (%)
Ectopic	2 (2.2)
Salpingitis	2 (2.2)
Corpus Luteal Cyst	16 (17.4)
Cyst Adenofibroma	2 (2.2)
Serious Cystadenoma	64 (69.6)
Mucinous Cystadenoma	2 (2.2)
Benign Cystadenoma	2 (2.2)
Ovarian Ectopic	2 (2.2)

Table 2: Comparison of previous abdominopelvic surgery with baseline and pre-post operative clinical characteristics of the patients (n = 92)

	Total	Previous Abdominopelvic Surgery		p-value
		Yes (n=36)	No (n=56)	
Age, years				
≤ 30	54	16 (29.6)	38 (70.4)	0.032^*
> 30	38	20 (52.6)	18 (47.4)	
Procedure				
Laparoscopic Salpingectomy	66	22 (33.3)	44 (66.7)	0.097^
Ovarian Cystectomy	26	14 (53.8)	12 (46.2)	
Gravida				
Unmarried	16	4 (25.0)	12 (75.0)	0.012~*
G1	24	4 (16.7)	20 (83.3)	
G2	26	12 (46.2)	14 (53.8)	
G3	16	10 (62.5)	6 (37.5)	
G4+	10	6 (60.0)	4 (40.0)	
Pre-operative indications				
Ruptured Ectopic	52	18 (34.6)	34 (65.4)	0.076~
Ovarian Cyst	12	2 (16.7)	10 (83.3)	
Pelvic/Abdominal Pain	18	10 (55.6)	8 (44.4)	
Miscellaneous	10	6 (60.0)	4 (40.0)	
Post operative diagnosis				
Ruptured Ectopic	54	16 (29.6)	38 (70.4)	0.168~
Ovarian Cyst	14	6 (42.9)	8 (57.1)	
Haemorrhagic Corpus Luteal Cyst	8	4 (50.0)	4 (50.0)	
Ovarian Ectopic	10	6 (60.0)	4 (40.0)	
Miscellaneous	6	4 (66.7)	2 (33.3)	
Hemodynamic Status				
Stable	74	32 (43.2)	42 (56.8)	0.115^
Unstable	18	4 (22.2)	14 (77.8)	

G: Gravida
^Chi-Square/~Fisher exact test applied, *p-value ≤ 0.05

Table 3: Comparison of previous abdominopelvic surgery with safety of laparoscopy (n = 92)

	Total	Previous Abdominopelvic Surgery		p-value
		Yes (n=36)	No (n=56)	
Blood loss				
Yes	84	32 (38.1)	52 (61.9)	0.382~
No	8	4 (50.0)	4 (50.0)	
If Yes (n= 84)				
≤ 100 mL	18	6 (33.3)	12 (66.7)	0.916^
101 – 500 mL	26	10 (38.5)	16 (61.5)	
>500 mL	40	16 (40.0)	24 (60.0)	
Time from Admission to Surgery				
≤ 6 hours	46	12 (26.1)	34 (73.9)	0.018^*
> 6 hours	46	24 (52.2)	22 (47.8)	
Duration of Hospital Stay				
≤ 1 day	84	34 (40.5)	50 (59.5)	0.475~
> 1 day	8	2 (25.0)	6 (75.0)	

- Per-operative transfusion was found in 14 patients with no previous abdominopelvic surgery
- Post-operative pyrexia was found in only 2 patients with no previous abdominopelvic surgery
- Wound infection and organ injury was found in none of the patients

^Chi-Square/~Fisher exact test applied, *p-value ≤ 0.05

DISCUSSION

The advent of laparoscopy in late 1980's as a convincing therapeutic intervention, prefigured a new surgical epoch. After viral spread of gynecologic laparoscopic surgery, considerable work has also been done on over emergency laparoscopy, as well as in cases with previous surgeries. The countries with low resources and slow learning curves like ours still have concerns about safety from both aspects. There is limited literature available from our country. The solution to these concerns is ways that guide minimizing morbidity while maintaining its superior benefit over open surgery. Such cases as acute abdomen due to gynecological cause, hemodynamic instability and with previous surgeries should be dealt with experienced surgeon. The setups with intensive care, provision of blood facilities and multiple disciplines should be entertaining such patients. The anticipation of presence of adhesions also needs specific safety protocols. Laparoscopic access is the crucial part of the surgery where Veress needle is blindly inserted followed by primary trocar. The majority of complications (30–50%) occur during surgical access[4] with vascular and bowel injuries being the most serious sequelae.[6] Adhesions involve mainly omentum (96%) and bowel (29%).[7] The use of alternate points and safety tests[8] on veress insertion, the deviation angle, adequate thrust and adequate incision size are few guidelines which need to be followed up in each case. The overall incidence of major injuries at the time of entry is 1.1/1000. Bowel injuries have occurred in 0.7/1000 laparoscopies and major vascular injuries in 0.4/1000 laparoscopies.[8] Various studies reported that every surgeon's experience is must in dealing such cases.[9-11]The difference in age between two groups was insignificant. The previous surgeries ranged from one Lower (Uterine) Segment Caesarean (LSCS) to four LSCS and laparotomies too. Magos AL *et al*. have also reported similar indications.[12] As a good auxiliary diagnostic tool, direct vision helped in diagnosing the condition in 8 patients (8.7%). It modified the pre-operative diagnosis in 22 cases (24%) and confirmed in 61 (67%). S N Aulesti *et al* had different results, 22% were diagnosed, 31 % were modified and 45% were confirmed.[13] In comparison to our study, although the result is different, however it is important to notice that the proportion of each group remains the same. Thus, it saves time by expediting the definitive treatment and expenses for more sophisticated investigations. Both the groups A and B had surgery after 6 to 8 hours since the admission. This period is in accordance with the guideline recomended by the EAES (European Association for Endoscopic Surgery), according to which the laparos-copic surgery is recommended to be performed in gynecological problems in less than 48 hours.[14]

Our results showed that there was no difference in the intraoperative and post-operative complications between both the groups. There was no trocar related

injury, vascular or organ injury in either group. However, a study conducted by Brill and Nezhat et al.in which they studied 360 women undergoing operative laparoscopy after a previous laparotomy showed different results.[15] According to their study, 28% patients suffered direct injury to the adherent omentum and bowel during the laparoscopic procedure.

There was no wound infection or wound gaping in either group. Similarly, only one patient in group A had post-operative pyrexia. Negoei *et al*, also had similar results for post-operative morbidity.[5] The incidence of peri-operative and post-operative complications were not significantly different (p-value 0.700) whether or not patient had previous abdominal surgery.[7] All these smaller studies results can be challenged by a recent large study of over 2888 surgeries. This larger study ended up with evidence of higher risk of complications with previous abdominal surgery; these results are irrespective of being done electively or as an emergency.[16] A higher post-operative complication rate of 13.4% was reported in a recent study of similar nature.[17] However Maccio et al reported complications in 3.45% of the cases.[18] Tanos et al reported 5.7% and Sizzi et al reported complications in 11.1% of the cases.[19,20] All fourteen (15%) patients had to be transfused. The criterion of transfusion does not imply much in this study as the commonest indication was ruptured ectopic pregnancy with eighteen patients (19.7%) being hemo dynamically unstable. Around fourteen (25.0%) patients that required transfusions were all hemo dynamically unstable patients and all of them fell in group A. Thus presence of surgical history had no impact on the need for transfusion.

As we know that laparoscopic surgery leads to shorter hospital stay, the patients in both group had on average 24 hours of post-operative stay. There was no conversion. Conversion is to an extent related to the in-experience.[14]

The strength of the study is that it is first ever from the country. All surgeries were performed by experienced gynecologists. Our study also compares the two arms. The limitations of the study are its small sample size and a single center study.

CONCLUSION

The increasing trend of laparoscopy has brought advancement in the field of surgery worldwide and its role in gynecological emergencies has been plausible so far. This research demonstrates that there was no difference between the emergency laparoscopic procedures performed in patients with a previous history of surgeries and patients with no previous history of surgery. It is safe to use in both the groups as both of the groups demonstrated lesser chances of vascular and tissue trauma, accurate diagnosis and treatment of patients with minimal complications and short hospital stay. Hence, gynecologists should use laparoscopic techniques for the management of gynecological emergencies in patients regardless of their previous history of abdominal surgeries.

ETHICAL APPROVAL: This study was approved by the Hospital's Ethics Committee of the Patel Hospital Karachi with the No (PH/IRB/2018/112).

AUTHORS' CONTRIBUTIONS: SS: Study concept and design, analysis and interpretation of data and drafting of manuscript. AB: Critical revision of manuscript. Final approval of the version to be published. SK: Drafting the work, Approval final version of the manuscript.

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