RECENT ADVANCES IN MINIM ALLY INVASIVE GENERAL SURGERY A RETROSPECTIVE STUDY

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ABSTRACT

OBJECTIVES

To evaluate the outcomes of minimally invasive general surgery (MIGS) and determine the indications for MIGS and its success rate.

METHODOLOGY

This retrospective study was conducted at the surgery unit of Hayatabad Medical Complex (HMC) Hospital, Peshawar, from January 2021 to December 2022. All the 200 patients who underwent MIGS were included in the study. Data regarding demographic characteristics, clinical presentation, type of MIGS, and intraoperative and postoperative complications were collected from the medical records and analyzed. The outcome of the study was assessed based on the success rate of the MIGS procedure and the occurrence of any postoperative complications.

RESULTS

The mean age of the patients was 43.3 years (range 10–75 years). The most common indication for MIGS was cholecystectomy (33.5%). Other indications included appendectomy (17.5%), hernia repair (12%), small bowel resection (10%), and gastrectomy (7%). The overall success rate of MIGS was 97.5%. The most common postoperative complication was wound infection (6.5%). There were no deaths due to MIGS.

CONCLUSION

The study findings suggest that MIGS is a safe and effective procedure for managing various surgical diseases and can be performed with minimal morbidity and mortality. Further randomized controlled trials are needed to confirm the safety and efficacy of MIGS in different settings.

KEYWORDS: *Minimally Invasive General Surgery, MIGS, HMC Hospital Peshawar,Outcomes*

INTRODUCTION

Minimally invasive general surgery (MIGS) is a modern and advanced surgical procedure method with minimal invasiveness and reduced morbidity and mortality.[1] It is a safe and cost-effective treatment form and is increasingly used to manage various surgical diseases. Minimally invasive surgery (MIS) is considered superior in terms of short hospital stay, early restart of routine activities and work and early turn over the beds and reducing the burden on hospitals. MIGS become standard for appendicitis and cholecystitis after the European Association for Endoscopic Surgery statement issued in 2006. A recent research conducted in Italy explored the effectiveness of laparoscopic techniques in treating acute abdominal conditions. The study revealed that the adoption of national guidelines has led to a significant rise in the use of minimally invasive surgery (MIS) approaches in various emergency scenarios, including appendicitis, cholecystitis, diverticulitis, and small bowel obstruction. This means that more surgeons are opting for laparoscopic methods in managing these conditions, potentially resulting in improved patient outcomes and recovery.[2] MIGS procedures involve using laparoscopy or thoracoscopy to visualize and access the surgical site.[3] Using laparoscopic and thoracoscopic techniques has been shown to reduce postoperative pain, length of hospital stay, and recovery time.[4] MIGS is increasingly used to manage various surgical diseases such as cholecystectomy, appendectomy, hernia repair, small bowel resection, and gastrectomy. Laparoscopy is a surgical technique that has shown potential advantages in certain cases of emergency bowel surgery. Some evidence suggests that it can lead to shorter hospital stays and lower postoperative mortality rates. While laparoscopy is commonly used in planned or elective bowel surgeries, its benefits in emergencies are not as well understood.[5] Other findings indicate that open surgical procedures have a higher risk of mortality compared to laparoscopic procedures across all time points. Laparoscopic procedures, particularly for biliary disease and appendicitis, have become the standard of care in Europe and are also expected to be the preferred approach in a large integrated healthcare system in the USA. On the other hand, open procedures were predominantly performed for diagnoses related to colorectal and small bowel obstruction. However, it has been demonstrated that laparoscopy can also be a safe and viable initial approach for these diagnostic groups.

In summary, the findings highlight that laparoscopic procedures generally carry a lower risk of death compared to open procedures. Laparoscopy has gained acceptance as the standard practice for specific conditions, while its potential benefits for other diagnoses, such as colorectal and small bowel obstruction, are being recognized.[6] In comparison to patients who underwent open surgery, those who received laparoscopic treatment demonstrated a lower overall operative risk. This was evidenced by a lower percentage of patients in the laparoscopic group having a higher American Society of Anesthesia (ASA) physical status classification of 3 or above (54.3% vs. 66.9%, p=0.03). Furthermore, a smaller proportion of patients in the laparoscopic cohort presented with systemic inflammatory response syndrome (SIRS), sepsis, or shock (58.6% vs. 69.5%), although this difference did not reach statistical significance (p=0.06). Although the duration of the operation did not differ significantly between the two procedures (132 ± 65 minutes for laparoscopic vs. 124 ± 52 minutes for open surgery, p=0.72), the laparoscopic approach to the Hartmann's procedure was associated with fewer dirty wounds (68.6% vs. 80.6%, p=0.02) and less involvement of resident physicians (47.1% vs. 64.2%, p=0.004). These findings suggest that laparoscopic treatment for this procedure carries a lower operative risk and may offer advantages such as reduced incidence of dirty wounds and decreased resident participation.[7,8] Evaluating the outcomes of MIGS, identifying appropriate indications, and assessing the success rate of this approach is essential for guiding clinical decision-making and optimizing patient outcomes. Through comprehensive evaluation, healthcare providers can better understand the benefits and limitations of MIGS, refine patient selection criteria, and ensure that the utilization of minimally invasive techniques aligns with best practices in general surgery. This rationale emphasizes the significance of investigating these aspects to advance the field of MIGS and improve patient care in the realm of general surgery. People still prefer open surgery compared to laparoscopic surgery. Moreover, there has been no previous study in Peshawar in the last couple of years.

METHODOLOGY

The study was conducted at the surgery unit of Hayatabad Medical Complex (HMC) Hospital, Peshawar, from January 2021 to December 2022. All the 200 patients who underwent MIGS were included in the study. Data regarding demographic characteristics, clinical presentation, type of MIGS, and intraoperative and postoperative complications were collected from the medical records and analyzed. The outcome of the study was assessed based on the success rate of the MIGS procedure and the occurrence of any postoperative complications. A total of 200 patients underwent MIGS during the study period. Data analysis was carried out using SPSS 23.0. The data was analyzed using descriptive statistical methods. A p-value of ≤0.05 was taken as statistically significant. Data regarding demographic characteristics, clinical presentation, type of MIGS, and intraoperative and postoperative complications were collected from the medical records. Data were collected for two years, from January 2021 to December 2022.

RESULTS

The overall success rate of MIGS was 97.5%. The most common postoperative complication was wound infection (6.5%). There were no deaths due to MIGS. This study showed that MIGS is a safe and effective procedure with an overall success rate of 97.5%. The most common indication for MIGS was cholecystectomy (33.5%), followed by appendectomy (17.5%), hernia repair (12%), small bowel resection (10%), and gastrectomy (7%). The most common postoperative complication was wound infection (6.5%). There were no deaths due to MIGS.

Table 1: Gender-Wise Distribution of Patients

Males	115	57.5%
Females	85	42.5%

Table 2: Finding of Indications for MIGS

Indication	No of Patients	%Age
Cholecystectomy	67	33.5%
Appendectomy	39	19.5%
Hernia Repair	35	17.5%
Laparoscopic Adhesiolysis	29	14.5%

Table 3: Postoperative Complications

Complications	No of Patients	%Age
Wound infection	13	6.5%
Intra-operative bleeding	03	1.5%
Postoperative ileus	02	1.0%
Mortality	0	0%

DISCUSSION

In recent years, surgeons have become increasingly fond of minimally invasive general surgery (MIGS), an advanced surgical technique.[9] Studies have shown that this treatment method results better than the traditional approach.[10] Patients experience less pain after surgery, spend less time in the hospital, and recover more quickly. The present retrospective study aimed to evaluate the outcomes of minimally invasive general surgery (MIGS) and determine its indications and success rate. The study was conducted at the surgery unit of Hayatabad Medical Complex (HMC) Hospital in Peshawar over two years from January 2021 to

December 2022. A total of 200 patients who underwent MIGS were included in the study, and their demographic characteristics, clinical presentation, type of MIGS, and intraoperative and postoperative complications were analyzed. The findings of this study demonstrated that MIGS is a safe and effective procedure for managing various surgical diseases. The overall success rate of MIGS was 97.5%, indicating a high rate of successful outcomes. The most common indication for MIGS in this study was cholecystectomy, followed by appendectomy, hernia repair, laparoscopic adhesiolysis, and gastrectomy. These results are consistent with the increasing utilization of MIGS for common surgical conditions such as gallbladder and appendix diseases. In terms of postoperative complications; wound infection was the most common complication, occurring in 6.5% of patients. However, it is important to note that there were no deaths associated with MIGS in this study. These findings highlight the favourable safety profile of MIGS, with minimal morbidity and no mortality observed in the study population. The results of this study support the growing body of evidence indicating the benefits of MIGS in terms of reduced invasiveness, shorter hospital stays, and faster recovery compared to traditional open surgery. The use of laparoscopic and thoracoscopic techniques in MIGS has been shown to decrease postoperative pain, minimize scarring, and accelerate the return to normal activities. These advantages contribute to improved patient outcomes and increased patient satisfaction. This study's results align with previous research that has demonstrated the safety and effectiveness of MIGS as a treatment option for various surgical conditions. Studies have indicated that MIGS is linked to decreased postoperative discomfort, shorter hospitalization periods, and quicker recovery times.[11] In addition, it has been discovered that MIGS is more cost-effective than open surgery because it requires a shorter hospital stay and incurs lower hospital expenses. It is important to remember that MIGS may not be the best option for every surgical situation and should only be utilized when suitable. According to the study, MIGS appears to be a secure and efficient method for treating different surgical conditions, and it can be carried out with minimal risks of complications or death.[12] According to the literature, laparoscopy is used in less than 20% of major emergency operations: the results of a recent research study from the National Emergency Laparotomy Audit (NELA) of England and Wales described that only 14.6% of cases were approached by laparoscopy with a conversion rate of 46.4%. A research study from the USA reported a higher proportion of minimally invasive surgery in general surgery (69.4%).[13,14] but most interventions were appendectomy and cholecystectomy, which was like our results. Regarding major colorectal emergency surgery, several reports describe feasibility and safety; moreover, the promotion of the use of MIGS is proved by a lot of didactic articles; however, in a large report, the proportion of patients treated with MIGS was only 5.66%.[15,16,17,18]

LIMITATIONS

Despite the positive findings, it is important to acknowledge the limitations of this retrospective study. The study was conducted at a single centre, which may limit the generalizability of the results. Additionally, the study design did not include a control group for comparison, and the data collection relied on medical records, which may have introduced some degree of bias or missing information. To further validate the safety and efficacy of MIGS, future research should consider prospective randomized controlled trials involving larger sample sizes and multiple centres. Comparative studies between MIGS and open surgery can provide more robust evidence regarding the benefits and limitations of each approach in different surgical scenarios. Furthermore, long-term follow-up studies assessing patient outcomes, such as recurrence rates and quality of life measures, would provide valuable insights into the sustained benefits of MIGS.

CONCLUSIONS

In conclusion, this retrospective study demonstrates that MIGS is a safe and effective procedure for various surgical diseases. The high success rate and low incidence of complications observed in this study support the growing adoption of MIGS in general surgery. However, further research is warranted to strengthen the evidence base and establish the optimal indications and long-term outcomes of MIGS in different clinical settings. The findings of this study contribute to advancing the field of MIGS and improving patient care in general surgery.

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