

Laparoscopy in Low-Income Countries

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Laparoscopy is an expensive procedure to adopt as it requires new equipment and specialized trained health workers. However, it could reduce post-operative costs and complications, especially in terms of infections. It is crucial to increase its accessibility, acceptability, and quality particularly in LMICs, especially during this COVID-19 era when the reduction of patient hospitalization is essential.

Keywords: laparoscopy ; low-income countries ; minimal invasive surgery

1. Introduction

Laparoscopy is defined as a type of surgical procedure that allows medical doctors to access the abdomen, pelvis, or thorax through small incisions on the skin ^[1]. The main advantages are: (I) to shorten the hospital stay and the recovery time, (II) to reduce pain and post-surgery bleeding, and (III) to minimize scarring ^[1]. Laparoscopy can be used to perform both diagnostic and treatment procedures, and it is mainly used in gynecology, gastrointestinal surgery, and urology ^[1].

The laparoscopic approach is preferred for a number of surgical procedures in high-income countries (HICs), while it is still not available in many low- and middle-income countries (LMICs) due to the high cost of purchasing and maintaining the equipment, and the lack of trained surgeons ^[2]. The equipment costs are not the only limit for implementing laparoscopy in LMICs. Appropriate training is also difficult due to the lack of dry and wet lab facilities and unaffordable trained specialists ^[3]. Moreover, in many LMICs it is difficult to promote new ideas in surgery, not only among patients but also among local surgeons due to cultural and social barriers ^[4].

However, initiatives are being implemented in LMICs in order to train dedicated health workers and to promote laparoscopy, especially in order to minimize post-surgical infection and to reduce recovery time ^{[5][6]}. More importantly, the advantages of laparoscopy compared to open surgery could be even more evident in settings with limited access to blood transfusion, clean water, and poor healthy living conditions ^[7]. Moreover, diagnostic laparoscopy may also be more economical and clinically effective in LMICs considering the lack of modern diagnostic imaging ^[8].

2. Laparoscopy in Low-Income Countries

The laparoscopic approach is an increasingly common procedure in LMICs, owing to more training activities and support programs that secure the required equipment for the operation ^[9]. In the studied hospitals, more than 350 laparoscopic surgeries both for diagnostic and therapeutic purposes were performed in a span of ten years. This number would have likely been higher if the COVID-19 pandemic had not reduced the number of surgeries, allowing only urgent open procedures; Cyclone Idai also destroyed sections of the registers, thus resulting in missing data. Our cases mainly included gynecological diseases, cholelithiasis, and appendectomy that are also the main reasons for laparoscopy in other LMIC studies. HIV status was reported in 25 cases and more than 70% of these cases were positive. Although these data do not reflect the HIV prevalence in the general population, Mozambique has one of the highest incidence of HIV worldwide, with an estimated prevalence in adults between 15 and 49 years of 12.5%; HIV is one of the main causes of morbidity and mortality, especially in children ^[9]. This aspect, which is not covered by any of the 55 studies included in the systematic review, is one of the major arguments for supporting the application of laparoscopy in HIV-endemic areas; the reduced intra- and post-operative bleeding, and its potentially lower risk for health workers makes it the ideal medical procedure. Moreover, considering the COVID-19 pandemic, the laparoscopy approach represents a safer procedure for surgeons as it is performed in a closed cavity, enabling the containment of aerosols ^[10].

The American Society of Anesthesiologists Classification includes the following six classes: (I) normal, healthy patients, (II) patients with mild systemic diseases, (III) patients with severe systemic diseases, incapacitating but not life threatening, (IV) patients with severe systemic diseases that are a constant threat to life, (V) moribund patients who are not expected to survive without an operation, and (VI) declared brain-dead patients ^[11]. Interestingly, the laparoscopic

approach allowed surgery in patients belonging to ASA classes III and IV—those who likely could not undergo open surgery. In the majority of the patients (76.9%), the procedure was performed in less than 2 h, while only 5 cases took more than 3 h. The time of surgery is influenced by the fact that the majority of the cases were diagnostic procedures. Data from the systematic review suggest that, in general, the amount of time required for laparoscopy is greater than that required for open surgery, but the hospitalization period is significantly lower for laparoscopy, highlighting the benefit of the minimal invasive approach. This is especially significant in a limited-resource setting where the hygienic conditions are generally poor.

In conclusion, laparoscopy could be introduced in low-resource settings without increasing complication rates, operation time, and hospital stay. In fact, although laparoscopy is an expensive procedure requiring adequate equipment and specialized well-trained health workers, it could reduce the post-operative costs and complications. In particular, in limited-resource settings with generally poor hygienic conditions, it could be effective in reducing infections and thus, in fighting antibiotic resistance. Although more effective efforts should be put in place in order to increase its accessibility, acceptability, and quality, laparoscopic surgery should be considered safe, effective, and feasible also in LMICs, especially in this COVID-19 era, during which it is essential to reduce the hospitalization of patients.

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