

Laparoscopy In Pediatric Surgery At Laquintinie Hospital: Descriptive And Analytical Study In A Limited-Resource Setting

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ABSTRACT

Laparoscopy represents a major advancement in pediatric surgery, allowing a significant reduction in postoperative morbidity and faster recovery. However, its implementation in low-resource countries continues to face major material and training constraints.

To describe the initial experience of laparoscopy in pediatric surgery at Laquintinie Hospital in Douala and to analyze factors associated with postoperative outcomes.

Methods: This was a descriptive and analytical cross-sectional study conducted from January 2024 to March 2025 in the pediatric surgery department of Laquintinie Hospital in Douala. Included were children aged ≥ 8 years who underwent laparoscopic surgery for a condition considered laparoscopically curable. Ethical considerations were respected, with written informed consent obtained from parents or legal guardians, and ethical authorization provided by the hospital institution. Statistical analyses used Chi-square, Fisher, Mann-Whitney, or Kruskal-Wallis tests, with significance set at $p < 0.05$. Thirty-nine patients were included, with a mean age of 11.9 ± 2.1 years and a slight male predominance. Appendicular conditions were the main indication. The time to management was significantly associated with the length of postoperative hospital stay ($p = 0.014$). Postoperative outcomes were uncomplicated in the majority of cases.

Keywords

Laparoscopy, Pediatric surgery, Low-resource countries, Surgical innovation.

Introduction

Minimally invasive surgery, and particularly laparoscopy, has progressively established itself as a standard technique in pediatric

surgery [1]. Its benefits are widely documented and include reduced postoperative pain, faster functional recovery, and a significant reduction in length of hospital stay [2].

Despite these advantages, the expansion of pediatric laparoscopy in low-resource countries remains hindered by several obstacles, including the high cost of dedicated pediatric equipment,

insufficient specialized training, and the need for a progressive learning curve to ensure patient safety [3,4].

In sub-Saharan Africa, several teams have reported encouraging experiences based on adapting available equipment and strict selection of surgical indications [5].

In Douala, pediatric laparoscopy is in a phase of gradual implementation, relying on a technical platform initially designed for adult surgery. To our knowledge, few structured data have been reported in Cameroon regarding the introduction of laparoscopy in pediatric surgery in such a context.

The objective of this study was to describe the laparoscopic experience in pediatric surgery at Laquintinie Hospital and to analyze factors associated with postoperative outcomes.

Results

This was a descriptive and analytical cross-sectional study conducted from January 2024 to March 2025 in the pediatric surgery department of Laquintinie Hospital in Douala, a reference hospital center.

Included were children aged 8 years and older, operated through laparoscopic approach for a condition considered laparoscopically curable.

The chosen age threshold was explained by the morphological adaptation required to use the available adult laparoscopy equipment, particularly a 10 mm scope. In the context of the learning curve, only indications corresponding to technically simple procedures were selected, in an approach aimed at optimizing patient safety and progressively standardizing pediatric laparoscopic practice.

The study was performed after ethical authorization approved by the competent hospital authorities, in compliance with patient confidentiality and anonymity. Written informed consent was systematically obtained from parents or legal guardians.

Qualitative variables were expressed as frequencies and percentages, and quantitative variables as mean \pm standard deviation or median depending on distribution. Comparisons used Chi-square or Fisher tests for qualitative variables, and Mann–Whitney or Kruskal–Wallis tests for quantitative variables, with the significance level set at $p < 0.05$.

Thirty-nine patients were included. Mean age was 11.9 ± 2.1 years, with ages ranging from 8 to 15 years. A slight male predominance was observed, with a sex ratio of 1.17.

Clinically, all patients were attending school. General condition according to the WHO classification was mostly classified as stages I (38.5%) and II (46.2%). Appendicular conditions were the main indication for laparoscopy in 66.7% of cases. Explorations

for undescended testicles were performed in 15.4% of cases, and four cases of symptomatic acute calculous cholecystitis were managed.

Therapeutically, patients were classified as ASA I (43.6%) and ASA II (56.4%). The procedures performed were dominated by appendectomy, with or without tubular surgical drainage (66.7%), followed by orchidopexy (15.4%) and cholecystectomy (10.3%) (Table 1).

Postoperative outcomes were uncomplicated in the vast majority of cases. No perioperative deaths were recorded.

Analytically, a statistically significant association was observed between time to management and length of postoperative hospital stay ($p = 0.014$) (Table 2). No significant association was found between postoperative complications and ASA classification, WHO general condition, or type of procedure performed, suggesting good overall tolerance of laparoscopy in this selected population.

Table 1: Therapeutic procedures performed.

Therapeutic procedure	Number	Percentage (%)
Appendectomy \pm drainage	26	66,7
Orchidopexy	6	15,4
Cholecystectomy	4	10,3
Others	3	7,6
Total	39	100

Table 2: Association between time to management and postoperative length of hospital stay.

Time to management	Median length of stay (days)	Statistical test	p-value
≤ 1 jour	3	Kruskal–Wallis	0,014
2–3 jours	4		
> 3 jours	5		

Discussion

This study describes one of the first structured experiences of laparoscopy in pediatric surgery in Douala. Our results confirm the feasibility and safety of this approach in a context marked by the lack of dedicated pediatric equipment, consistent with recent observations from other low-resource countries [5-7].

The choice of an age threshold ≥ 8 years and the selection of simple procedures are part of a pragmatic strategy recommended during the initial implementation phase of pediatric laparoscopy [8]. Recent studies published between 2024 and 2025 emphasize that adapting adult equipment, combined with progressive team skill development, makes it possible to obtain outcomes comparable to those in better-equipped centers [7,9].

The significant association between time to management and length of postoperative hospital stay observed in our study confirms the impact of diagnostic and organizational delays, which are frequently reported in sub-Saharan Africa [6,9].

Beyond clinical results, our experience highlights a dynamic of local innovation based on optimizing available resources and progressively integrating minimally invasive surgery into pediatric healthcare services in Douala.

Limitations

The limited sample size, single-center design, and lack of long-term follow-up are the main limitations of this work. Furthermore, the absence of long-term follow-up prevents evaluation of late complications or long-term functional outcomes.

Conclusion

Pediatric laparoscopy is feasible and safe at Laquintinie Hospital in Douala, despite the use of equipment initially designed for adults. This experience illustrates surgical innovation adapted to the local context and provides a foundation for the future development of pediatric minimally invasive surgery in Cameroon.

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