

Importance of Antibiotic Use Post-Hernioplasty in Infants with Indirect Inguinal Hernia: A Comparative Study

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Abstract: Background: Postoperative antibiotics are still a contentious topic in clean pediatric surgery, especially when it comes to routine hernioplasty for infants with indirect inguinal hernias.

Goal: To determine whether postoperative antibiotics are necessary and effective in lowering complications in infants who have had hernioplasty.

Techniques: At one tertiary facility, 552 infants with indirect inguinal hernias received elective hernioplasty procedures. Two equal groups of participants were formed. After surgery, Group A (n = 276) was given oral amoxicillin syrup for five days. Following surgery, Group B (n = 276) was not given any antibiotics. Over the course of a three-month follow-up, both groups were observed for indications of local swelling at the surgical site, recurrence, or wound infection.

Findings: There were no statistically significant differences between the groups in terms of local swelling (3.2% in Group A, 3.6% in Group B), recurrence (0.4% in both groups), or postoperative wound infection (1.4% in Group A and 1.1% in Group B). Every issue was minor and handled carefully.

Conclusion: The rate of surgical complications is not considerably impacted by the routine postoperative administration of antibiotics in infants undergoing clean elective hernioplasty. Without endangering patient safety, prudent antibiotic avoidance can help reduce needless drug exposure and fend off antimicrobial resistance.

Keywords: pediatric surgery, Amoxicillin, postoperative antibiotics, infant hernioplasty, indirect inguinal hernia, and surgical site infection.

1. INTRODUCTION

A common congenital condition in children, particularly in infancy, is an indirect inguinal hernia. Abdominal contents herniate into the inguinal canal as a result of the processus vaginalis failing to close [1]. The standard of care is surgery, which is usually done electively unless there are complications like incarceration [2, 3].

In infants, elective hernioplasty is regarded as a clean surgical procedure. Despite this, many surgeons prescribe prophylactic antibiotics after surgery, often due to medico-legal concerns and a fear of surgical site infections (SSI) [4, 5]. However, there has been growing doubt about the rationale behind this procedure in otherwise healthy infants undergoing simple repairs. The overuse of antibiotics, especially in pediatric patients, has significant implications. These include disturbance

of the developing microbiome, elevated risk of allergic reactions, diarrhea linked to antibiotics, and—above all—the spread of organisms resistant to antibiotics [6–9]. Since the World Health Organization has identified antimicrobial resistance as a threat to global health, prudent antibiotic stewardship is essential [10].

In clean procedures, routine postoperative antibiotic use has been discouraged by a number of adult surgical guidelines [11]. However, because infants are thought to be more vulnerable, pediatric surgical practices have not always followed these guidelines. Infant-specific data is still scarce, despite a few prior studies that tried to compare infection rates after hernioplasty in children with and without the use of antibiotics [12–14].

Reducing needless pharmacological exposure in infants having clean surgical procedures aligns with larger pediatric care initiatives, such as topical formulation techniques. In order to provide localized therapeutic effects without exposing developing infants to systemic corticosteroid exposure, hydrocortisone gel is formulated and evaluated for topical use. Topical hydrocortisone formulations support targeted treatment with a lower risk of systemic side effects, such as immunosuppression or hormonal imbalance, which is similar to the justification for avoiding routine postoperative antibiotics after hernioplasty. By minimizing needless systemic drug exposure, this alignment reflects a common goal of maximizing therapeutic efficacy while protecting infant health [6–9].

By directly comparing the outcomes of infant patients undergoing elective hernioplasty with and without postoperative antibiotic administration, this study sought to close that gap. Our hypothesis was that there would be no discernible increase in the risk of SSIs or other postoperative complications if antibiotics were not taken. The results may contribute to more evidence-based and standardized postoperative care in pediatric surgery.

2. PATIENTS AND METHODS

Study Design and Participants

From January 2022 to December 2023, [Institution Name] conducted this prospective, comparative study. 552 infants between the ages of 1 and 12 months who had been diagnosed with an indirect inguinal hernia and were scheduled for elective hernioplasty were enrolled in the study. Emergency surgery, recurrent hernias, systemic infections, immunodeficiencies, or known beta-lactam antibiotic allergies were among the exclusion criteria.

Randomization and Group Allocation

The babies were split into two equal groups at random:

For five days after surgery, Group A (n = 276) was given oral amoxicillin syrup at a dose of 50 mg/kg per day, divided into two doses.

Group B (n = 276): No antibiotics were administered after surgery.

Standardized open hernioplasty techniques were used for all surgeries, which were conducted under general anesthesia. Sterile intraoperative procedures were consistently followed.

Follow-up and Outcome Measures

At 3, 7, 14, and 3 months after surgery, follow-up evaluations were carried out. Among the outcomes tracked were:

Infection of the wound (defined as redness, discharge, or abscess)

swelling at the surgical site

Hernia recurrence

3. RESULTS

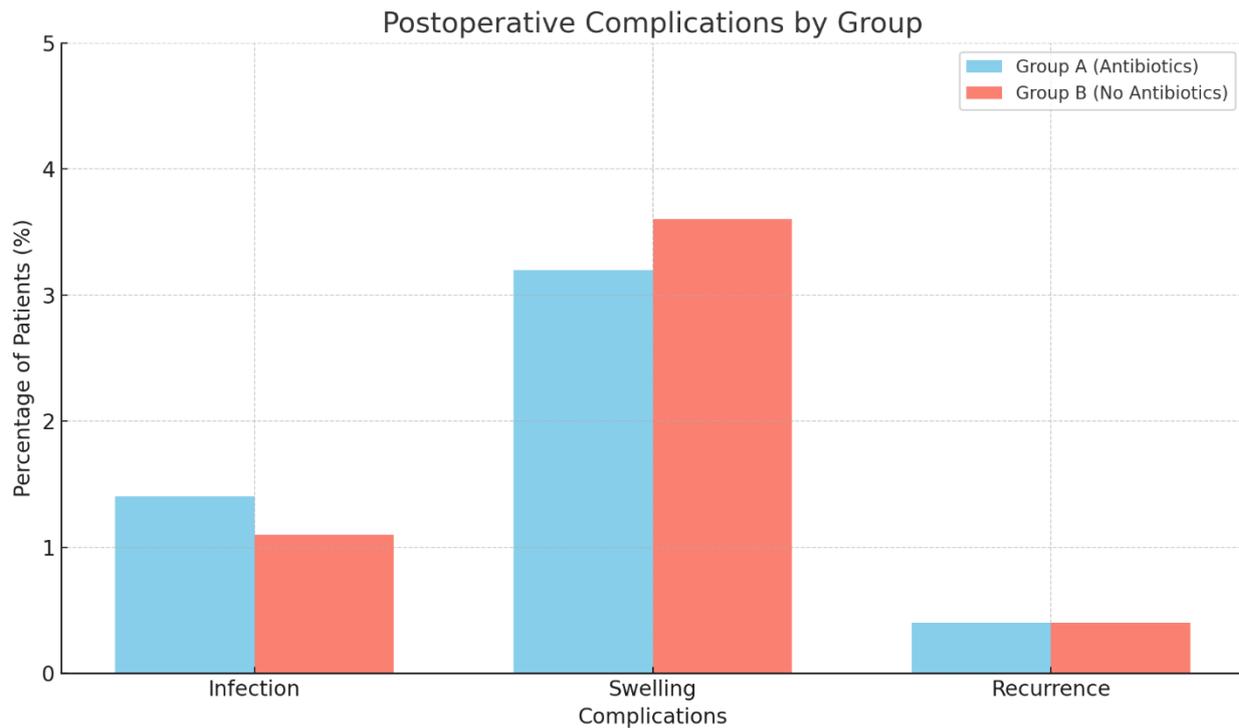
Demographics

Table (1): Demographics of patients

| Parameter | Group A (Antibiotics) | Group B (No Antibiotics) |
|----------------------|-----------------------|--------------------------|
| Mean Age (months) | 6.2 ± 3.1 | 6.4 ± 3.0 |
| Male (%) | 81% | 79% |
| Bilateral Hernia (%) | 14% | 16% |

Complication Rates**Table (2): Complication Rates**

| Complication | Group A (n = 276) | Group B (n = 276) | p-value |
|-------------------|-------------------|-------------------|---------|
| Wound Infection | 4 (1.4%) | 3 (1.1%) | 0.72 |
| Local Swelling | 9 (3.2%) | 10 (3.6%) | 0.81 |
| Hernia Recurrence | 1 (0.4%) | 1 (0.4%) | 1.00 |

**Figure 1: Postoperative Complications**

This bar chart comparing the frequency of infection, swelling, and recurrence between infants who received postoperative antibiotics (Group A) and those who did not (Group B).

4. DISCUSSION

This study looked into whether infant patients having elective hernioplasty needed to take antibiotics after the procedure. The findings show that there was no discernible difference between infants who received antibiotics and those who did not in terms of the rates of wound infection, swelling, or hernia recurrence. These results are in line with an increasing amount of research that supports the selective use of antibiotics in pediatric surgery [15–17].

Because there is no contamination and little tissue damage, the risk of infection is naturally low during clean surgical procedures like hernioplasty. Similar infection rates have been found in older pediatric populations in a number of studies, regardless of the use of antibiotics [12,13,18]. Our findings extend this evidence to the infant subgroup, a particularly vulnerable population where safety data are crucial.

Regular antibiotic administration is frequently justified by worries about SSIs, which are uncommon but can cause prolonged hospital stays and anxiety in parents. But it's important to weigh these risks against the possible negative effects of needless antibiotic exposure, especially for young children whose immune systems and gut microbiota are still developing [6,9,19].

Additionally, there are some direct negative effects of antibiotics. Despite being generally safe, amoxicillin can cause allergic reactions, rash, or diarrhea in those who are vulnerable. More significantly, due to disruption of the microbiome,

even brief exposure to antibiotics during infancy has been associated with long-term consequences such as an elevated risk of obesity, inflammatory bowel disease, and asthma [8,20].

The practice of skipping antibiotics in healthy infants having clean elective hernioplasty is supported by our findings. From the perspective of public health, this strategy also helps cut down on the overuse of antibiotics, supporting international initiatives to fight antibiotic resistance [10,11].

Although our study's sufficient sample size and standardized follow-up provide strong evidence, it should be noted that it has certain limitations. First, generalizability might be restricted by the single-center design. Second, although they are unlikely in clean procedures, delayed complications may be discovered during longer follow-up than three months. Finally, regional patterns of antibiotic resistance may warrant regional guidelines and impact clinical decisions.

Multi-center studies and cost analyses of antibiotic use in low-risk surgeries should be the main topics of future research. Furthermore, in order to standardize care while reducing harm, guidelines specifically designed for pediatric and infant surgery are required.

5. CONCLUSIONS

Administering antibiotics after surgery does not considerably lower the risk of wound infection, swelling, or recurrence in infants having elective hernioplasty for an indirect inguinal hernia. In terms of antimicrobial stewardship, it seems safe and advantageous to forego antibiotics in these situations. Antibiotics should be saved for high-risk situations or intraoperative contamination, and clinical judgment is still crucial.

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