E-ISSN: 2708-1508
P-ISSN: 2708-1494
Impact Factor (RJIF): 5.39
IJCRS 2025; 7(2): 215-219
www.casereportsofsurgery.com
Received: 26-07-2025
Accepted: 29-08-2025

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Understanding the spectrum of paediatric surgical cases: Insights into elective and emergency interventions

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DOI: https://www.doi.org/10.22271/27081494.2025.v7.i2d.222

Abstract
This retrospective study was conducted at Sheth Lallubhai Gordhandas Municipal Corporation Hospital, Ahmedabad, over two years to understand the spectrum of pediatric surgical cases. A total of 589 procedures were performed on 567 patients aged 0–14 years, with a male-to-female ratio of 5:1 and a median age of 9 years. The most common conditions were phimosis (26.16%), congenital inguinal hernia (18.24%), and acute appendicitis (15.32%). Elective surgeries made up 69.61% of the cases, while 30.39% were emergencies. Most circumcisions and herniotomies were elective, whereas appendectomies were mainly emergencies. The findings highlight the predominance of elective surgeries but also emphasize the continued burden of emergency cases, especially acute appendicitis and trauma. Strengthening pediatric surgical services, early referral systems, and specialized care facilities can help improve outcomes and reduce morbidity in pediatric patients.

Keywords: Pediatric surgery, elective surgery, emergency surgery, phimosis, inguinal hernia, appendicitis, pediatric health services

Introduction
Pediatric surgery is a specialised field that deals with several conditions, ranging from congenital malformations and developmental anomalies to acquired diseases and traumatic injuries. It is imperative to get a clearer understanding about the array of surgical procedures performed and the factors that influence the urgency of the intervention to improve the quality of care for pediatric patients by ensuring effective resource allocation [1]. Elective and emergency surgeries in pediatric patients differ in their clinical approach and time-sensitivity. Elective surgeries require in-depth pre-operative assessment and integrated planning. On the other hand, emergency cases deal with more time-critical presentations. Inguinal hernias, phimosis and gastrointestinal malformations are some of the common elective cases while examples of emergency conditions include intestinal obstruction, acute appendicitis and trauma.
Pediatric surgical conditions require prompt attention and appropriate surgical care to prevent morbidity and mortality [2]. Surgical diseases in the pediatric population are under-addressed globally due to the shortage of surgeons specialised in pediatric surgery, especially in developing countries like India, even though surgical intervention is often the only answer to several pediatric surgical conditions [3].
This study aims to study the spectrum of pediatric surgical cases and to examine the distribution of elective and emergency cases in pediatric patients.

Subjects and Methods
This was a retrospective observational study of all pediatric patients over a period of 2 years from January 2023 to December 2024 at a Sheth Lallubhai Gordhandas Municipal corporation hospital, Maninagar, Ahmedabad, Gujarat, India. The data was collected using existing hospital records from surgical operation theatre. The obtained data included patients' age, sex, diagnosis, surgery performed, urgency of the procedure i.e., elective or emergency and the type of anaesthesia used. All patients aged 0 - 14 years with complete records for the relevant variables were included in the study. The study excluded patients with incomplete or missing data. Data obtained was presented using tables and charts. Descriptive analysis was done using Microsoft Excel. The aim of this study is to understand the spectrum of surgeries performed, distinguish between elective and emergency interventions, and identify patterns in diagnoses and surgical procedures.

Patient confidentiality was maintained throughout the study. No identifiable information was included in the dataset. This study was observational in nature and does not involve any interventions or prospective data collection.

Results

Five hundred and eighty-nine procedures were performed on 567 patients over a period of 2 years. There were 472 (83.25%) boys and 95 (16.75%) girls, giving a male-to-female ratio of approximately 5:1, indicating a notable male predominance. The median age of all the patients at surgery was 9 years, with the ages ranging from 2 months to 14 years. Figure 1 shows the age and sex distribution of the patients at the time of each procedure.

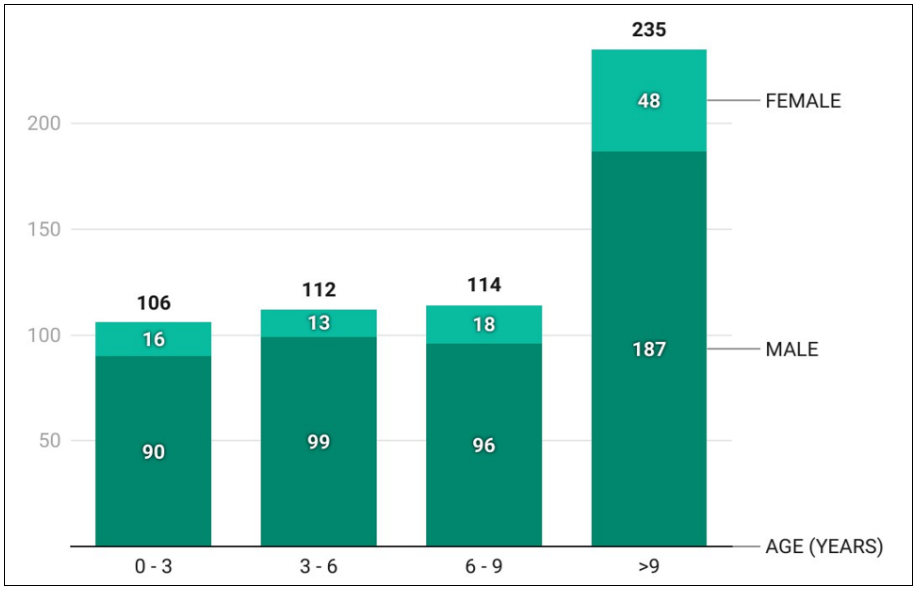


Fig 1: Age and sex distribution of the patients as at the time of each procedure

Phimosis (152, 26.16%), Congenital inguinal hernia (106, 18.24%) and Acute appendicitis (89, 15.32%) accounted for the majority of the cases. [Table 1] The most common condition affecting boys was phimosis, while acute appendicitis was the most common in girls. Nine (~1.6%) patients had unplanned re-operation (s) related to their initial presentation, while six (1.1%) had staged procedures. Trauma accounted for 16 (2.8%) procedures performed at the hospital. Others in the table also include some rare cases like choledochal cyst, Hirschsprung's disease, rectal polyps which requires super speciality pediatric surgical units for their management.

Table 1: Pattern of paediatric surgical cases managed at Sheth Lallubhai Gordhandas Municipal General Hospital, Maninagar, Ahmedabad, Gujarat, India between January 2023 and December 2024

Diagnosis	Frequency (%)	Male	Female
Phimosis	152 (26.16)	152	0
Congenital inguinal hernia	106 (18.24)	94	12
Acute appendicitis	89 (15.32)	74	15
Benign swelling	23 (3.96)	15	8
Hydrocele	19 (3.27)	19	0
Epidermoid/Ganglion/Sebaceous cyst	12 (2.07)	2	10
Liver abscess	10 (1.72)	10	0
Polydactyly	8 (1.38)	6	2
Undescended testis	8 (1.38)	8	0
Testicular torsion	8 (1.38)	8	0
Umbilical hernia	7 (1.2)	3	4
Abscess	6 (1.03)	4	2
Fibroadenoma	6 (1.03)	0	6
Inguino-scrotal hernia	6 (1.03)	6	0
Others	121 (20.83)	81	40

One hundred and seventy-nine (30.39%) cases were emergency procedures, while 410 (69.61%) were elective cases [Figure 2].

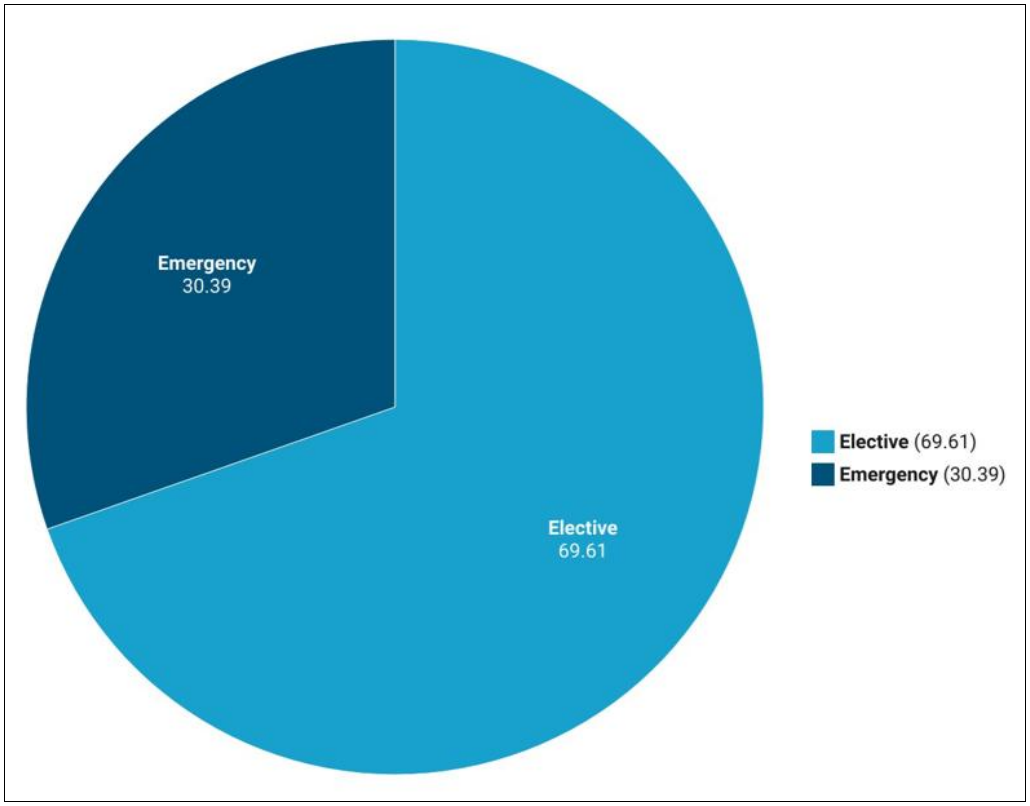


Fig 2: Percentage of elective vs. emergency surgeries

Figure 3 depicts the number of elective and emergency surgeries by procedure. Majority of open appendectomy procedures were performed as emergencies - 84 out of 89, while majority of circumcision (154 out of 158) and inguinal herniotomy (127 out of 132) were elective surgeries.

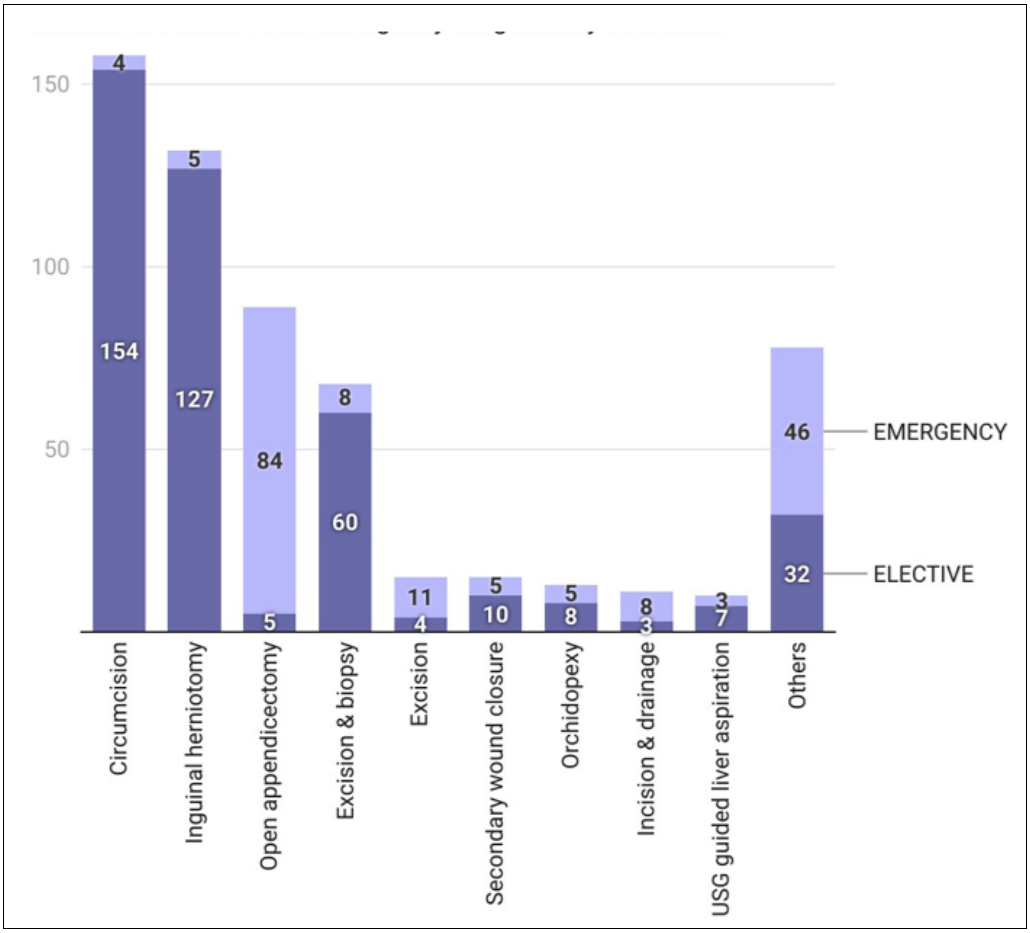


Fig 3: Number pf elective and emergency surgeries by procedure

Discussion

Despite the significance of pediatric surgery, the specialty is largely overlooked at the global level [4]. This study provides a broad view of pediatric surgical practice, emphasizing the dominance of elective procedures but also highlighting the persistent burden of emergency interventions.

The male predominance observed, aligns with known anatomical and physiological predispositions such as inguinal hernias, phimosis and undescended testes.

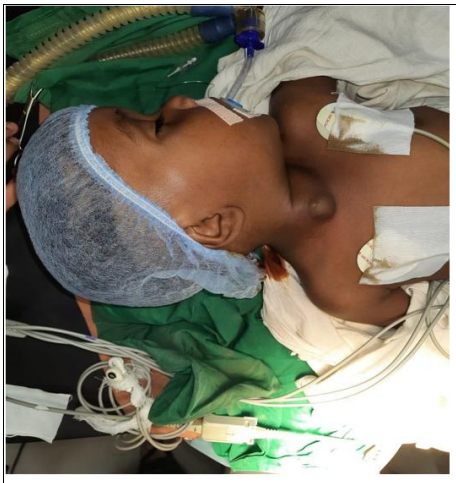
The high proportion of elective surgeries such as circumcision, herniotomy and orchidopexy reflects effective screening and referral mechanisms for common pediatric conditions.

In contrast, emergency surgeries often involved late-presenting cases, requiring urgent care. The data highlights that acute appendicitis remains the common cause of emergency interventions. The significant number of emergency cases underscores the need for early detection and rapid referral systems.

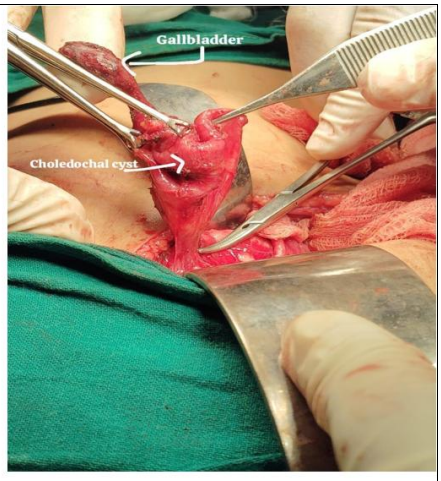
Phimosis, congenital inguinal hernia and acute appendicitis are the most common causes of surgery in the pediatric age group at our institution. The most common condition affecting boys was phimosis, while acute appendicitis was the most common in girls. Majority of open appendectomy procedures were performed as emergencies, while the majority of circumcision and inguinal herniotomy were elective surgeries.

The findings call attention to the pressing need for:

- Improved community awareness about pediatric surgical conditions
- Better referral infrastructure
- Strengthening of pediatric emergency services and neonatal surgical care capacity



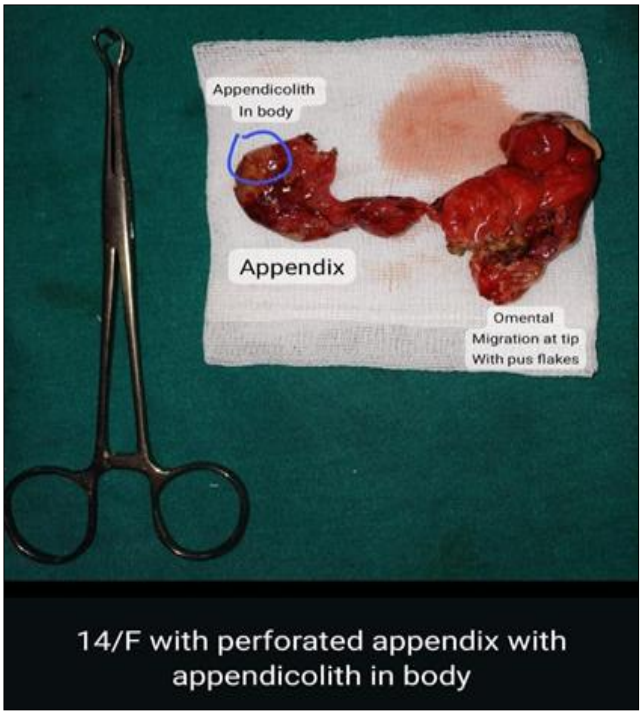
2.5 Y/M with a lymphangioma over anterior aspect of right side of neck



3Y/F operated for choledochal cyst with excision + hepaticojejunostomy

Specimen of aspirate obtained from liver abscess drainage

Post-operative image of an 8Y/M operated with circumcision for phimosis



Limitation

The study might not reflect the nation-wide picture because it was a single-centre study and the study samples were not randomized.

Conclusion

This study has provided an overview of paediatric surgical procedures (including rare super speciality pediatric surgeries) carried out in a General Surgery department at our tertiary care hospital. It emphasized the need to focus on the significant pediatric surgical load in such an environment. In today's time, it is a necessity to establish a pediatric surgical unit in hospitals in developing countries, like India. An editorial in the Journal of Indian Association of Pediatric Surgeons mentioned - "Recently, the National Medical Commission in their medical education board circular (U.11022/3/2023-UGMED) dated June 23, 2023, has mandated that for hospitals with a hundred general surgery beds, at least 10% shall be dedicated to pediatric surgery. They have also stressed the need for a pediatric intensive care unit and neonatal
intensive care unit to cater to the children." [5] Moreover, it has been found that due to the absence of a dedicated pediatric surgery department in several medical institutes, a large proportion of pediatricians were not exposed to pediatric surgical cases in their training period. Pediatric surgical care and outcome can improve if pediatricians are exposed to the cases handled by pediatric surgeons [6].

Acknowledgement

Not available

Author's Contribution

Not available

Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article

Barad R, Patel K, Sheth D, Shah T, Suvera M. Understanding the spectrum of paediatric surgical cases: Insights into elective and emergency interventions. International Journal of Case Reports in Surgery. 2025;7(2):215-219