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Original Article

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Retrospective Study of General Surgery Department Operative Procedures Pattern Performed at a Tertiary Health Institution in Amreli

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ABSTRACT

Background: Considering the distribution of surgical diseases is essential for optimal allocation of resources, clinical arrangement, and surgical training. This study purposes to analyse the pattern and frequency of various surgical conditions among patients in a tertiary care setting using a proportionate.

Methods: This retrospective descriptive study analyzed 1558 surgical procedures performed and the study was conducted from January 2023 to December 2024 in the General Surgery Department of a tertiary hospital in India. The study focused on elective and emergency cases. Data were extracted from theatre operation registers, and statistical analysis was done using IBM SPSS. Descriptive statistics and Chi-square tests were used to evaluate surgeon involvement and surgery urgency, with ethical approval obtained before the study.

Results: The most predominant conditions were hernia in 222 patients (14%), followed by appendicitis (13.28%). Inguinal hernias dominated the hernia group. Other distinguished categories of procedures included circumcision, thyroidectomy, laparotomy, fisurelotomy, amputation, and hemi-rectomy.

Conclusion: The study provides a comprehensive analysis of 1558 patients undergoing surgery in the General Surgery department. The findings highlight the predominance of hernia and appendiceal diseases, underscoring the need for efficient resource allocation and specialised surgical services in tertiary centres.

Key-words: Surgical disease distribution, Hernia, Appendicitis, Inguinal hernia

INTRODUCTION

General surgery, encompassing the abdominal organs, skin, breast, soft tissues, and, to a lesser extent, endocrine organs, is one of the fundamental disciplines of clinical medicine with a wide range of operative involvements. In many parts of India, general surgeons form the backbone of surgical care, dealing with both elective and emergency procedures, in Amreli, Gujarat [1]. A tertiary care institution in such a setting is often the final referral centre and a critical provider of both routine and life-saving surgeries. Considering the pattern of operative procedures performed in such institutions not only sheds light on the prevalent surgical diseases in the region but also assists in resource allocation, training priorities, and healthcare planning [2].

Retrospective analysis of surgical procedures offers valuable considerate into the evolving trends in surgical practice, technological adoption, and disease occurrence. It reflects the burden of surgical disease in the community and provides critical data to support public health initiatives. Moreover, such a study helps in identifying the most common indications for surgery, frequency of elective vs. emergency involvements, seasonal differences, age and sex distribution of surgical patients, and operative outcomes [3].

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Tertiary healthcare institutions, predominantly those in underserved districts like Amreli, serve a dual purpose: they not only provide critical healthcare services but also act as training grounds for budding medical professionals. Therefore, an evaluation of surgical practices in such settings carries implications for academic development, infrastructure planning, and policy formulation [4]. With the increasing demands are most is essential for efficient planning, inventory management, and optimising surgical team deployment on surgical departments and limited resources, knowing what types of procedures.

The district of Amreli, located in the Saurashtra region of Gujarat, has a diverse population with varied health requirements. The general population comprises rural and semi-urban residents, and access to specialised medical care is often restricted to district-level institutions [5]. The General Surgery Department at the tertiary care hospital in Amreli plays an essential role in providing surgical care, often functioning beyond the standard expectations due to the limited availability of subspecialty surgical services. The range of surgical procedures performed here reflects both the burden of common general surgical conditions and the capability of the department [6].

Communal general surgical procedures typically include appendectomies, hernia repairs, debridement, laparotomies for intestinal obstruction or perforation, cholecystectomies, surgeries for abscesses, soft tissue swellings, trauma-related involvements, and anorectal procedures such as haemorrhoidectomy and fistulectomy [7]. Over recent years, with the arrival of laparoscopy and improved anaesthesia techniques, even rural institutions have witnessed a shift from open to minimally invasive procedures, especially in elective cases [8].

This retrospective study was conducted in Amreli and aims to analyse the pattern of surgical procedures performed over a defined period at the General Surgery Department of a tertiary healthcare institution. Classifying them by elective and emergency categories, analysing patient demographics, and sympathetic tendencies over time, including identifying the most commonly performed surgeries. In addition, it proposes to make available data that can guide improvements in training, hospital policy, and future healthcare planning [9].

Sympathetic, these patterns can also inform public health campaigns intensive on early detection and management of common surgical conditions. For example, a high number of emergency appendectomies or perforation peritonitis cases could indicate delays in presentation and diagnosis, necessitating community-level involvement. In the same way, if a large proportion of surgeries involve abscesses or infected wounds, it may reflect broader issues related to hygiene, infection control, or chronic conditions like diabetes mellitus [10].

A systematic and data-driven evaluation of operative procedures at tertiary organisations like the one in Amreli is vital for the continued improvement of surgical services. This study is designed not only to provide a photo of the surgical burden but also to act as a reference for guiding upcoming initiatives in clinical care, medical education, and regional health procedures [11].

MATERIALS AND METHODS

Research Design- This study was a retrospective descriptive analysis of surgical procedures accomplished in the General Surgery Department at a tertiary health institution in Amreli. The study was conducted from January 2023 to December 2024. Ethical approval was obtained from the institutional ethical review committee before the commencement of the study. Data were extracted from the central theatre operation registers and divisional procedure registers, with a total of 1558 patients included in the analysis. These patients experienced either elective or emergency surgeries, performed by the general surgery or in collaboration with other specialties**.**

Inclusion Criteria

- All patients who underwent elective or emergency surgical procedures in the General Surgery Department.
- Surgeries performed within the study period.
- Cases in which surgery was conducted by the general surgery unit either independently or in collaboration with other surgical departments.

Exclusion Criteria

- All surgical procedures are performed in other surgical departments like ENT, Orthopaedics, Ophthalmology and Obstetrics & Gynecology.

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- ❖ All cases were managed during surgical outreach programs organised by the institution.
- ❖ Patients whose records were incomplete or missing critical data required for analysis.

Statistical Analysis- Collected data included demographics, diagnosis, procedure, type of anaesthesia, urgency of surgery, and completeness of records. Descriptive statistics (frequencies, means, medians, SD, and IQR) were used for summarisation. Associations between surgeon cadre and urgency of surgery were analysed using the Chi-square test, with $p<0.05$ considered significant. Analyses were performed using IBM SPSS Statistics (Version 25.0).

RESULTS

The demographic and intra-operative profile of the 1558 patients analysed in this retrospective study shows a predominance of male patients (58.8%), with the majority falling within the 25–54-year age range. Most surgeries were non-trauma-related, reflecting the routine operative burden in gastrointestinal domains rather than emergency trauma care. Elective surgeries constituted a large portion (89.15%) of the total cases, consistent with a planned surgical approach in tertiary settings. Spinal anaesthesia was the most frequently used modality (61.87%), followed by general anaesthesia (28.3%). Only a small fraction of procedures were performed using block forms of anaesthesia. Most operative records were complete (Table 1).

Table 1. Patients' Demographics, Intra-operative Data, and Completeness of Data Entry

Variable	Category	Frequency (n)	Percentage (%)
Sex	Male	958	61.49
	Female	600	38.51
Age Group	≤13 years	196	12.59%
	14–24 years	235	15.09%
	25–34 years	241	15.47%
	35–44 years	228	14.64%
	45–54 years	199	12.78%
	55–64 years	224	14.38%
	65 & above	233	14.96%
Surgery Type	Elective	1389	89.15%
	Emergency	169	10.85%
Anaesthesia	Spinal	964	61.87%
	General	441	28.30%
	Block	153	9.82%

This distribution showed that among the 1558 patients analysed, the most predominant conditions were hernia (14%), appendicitis (13.28%), followed by debridement (12%). Other distinguished categories of procedures included circumcision, thyroidectomy, laparotomy, fistulectomy, amputation, and haemorrhoidectomy. The diversity of diagnoses underscores the breadth of surgical care required, with both common and rare conditions represented (Fig. 1).

The operative spectrum is further illustrated in Fig. 2, which depicts the diverse patterns of surgeries performed in the department. This figure illustrates the balance between elective and emergency procedures, reflecting the diverse surgical workload that encompasses gastrointestinal, hepatobiliary, endocrine, and soft tissue operations. The distribution underscores not only the predominance of commonly performed surgeries such as hernia repair and appendectomy but also the presence of less frequent, complex interventions that demonstrate the department's role in providing comprehensive surgical care.

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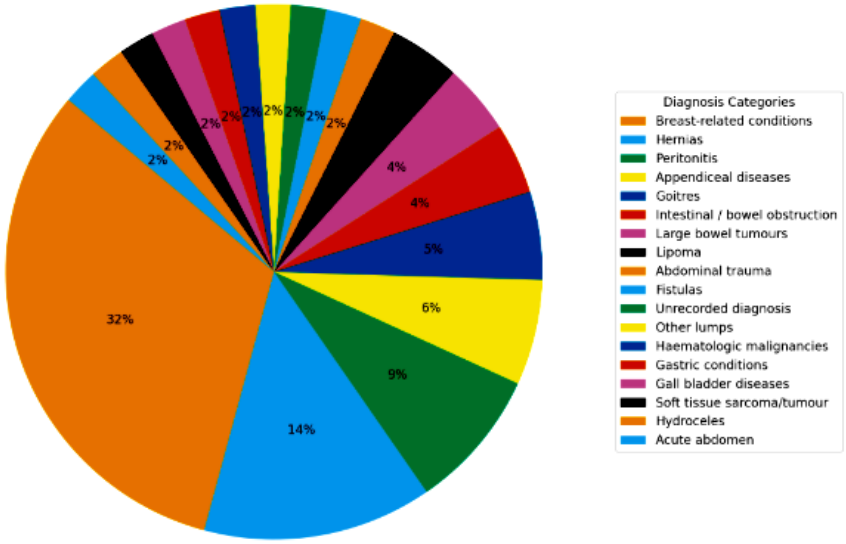

Fig. 1: Distribution of Patients by Diagnosis

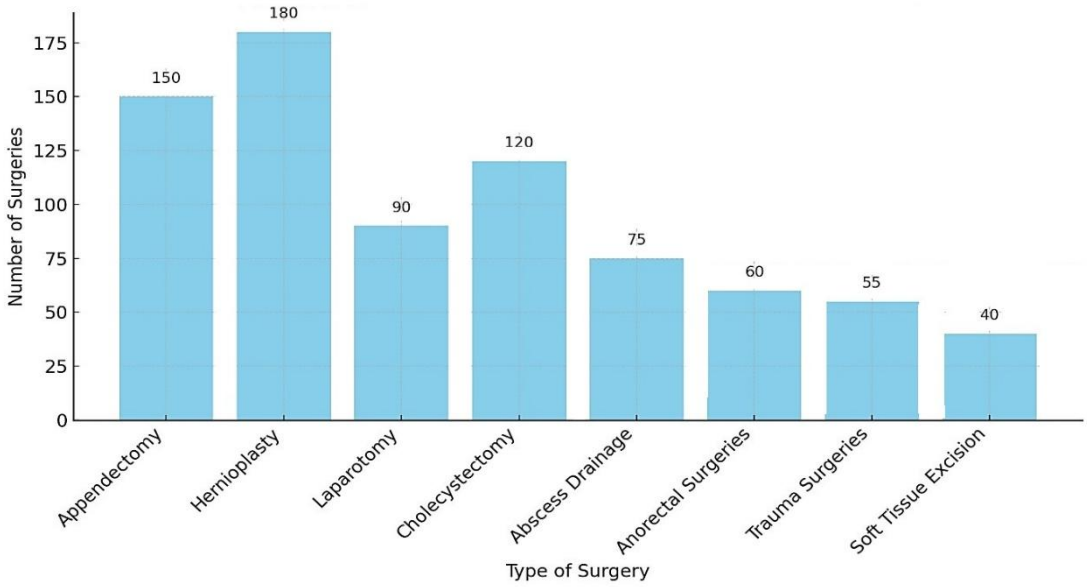

Fig. 2: Various patterns of surgeries being performed in the department

Among the 1558 patients, appendix cases (12%) were also significant. Other abdominal conditions like duodenal ulcer, gastric ulcer, and colonic causes were less common. Overall, each surgical group had a few conditions that made up most cases, while others were much less frequent. Hernias were the most common condition, making up about 21% of cases. Appendicitis/appendectomy were also frequent, accounting for around 14% and 13% respectively. Other common procedures included debridement, laparotomy, and gallstone surgeries. Less frequent conditions were abscess drainage, amputations, haemorrhoidectomy, and a mix of rare procedures (Table 2).

Table 2: Distribution of Other Disease Categories

Condition / Procedure	Frequency (n)	%
Hernia (all types)	322	20.67
Appendicitis / Appendectomy	207	13.29
Debridement	187	12.01
Cholecystectomy / Gallstones	110	7.07
Laparotomy (for obstruction, etc.)	121	7.77
Abscess drainage	86	5.52
Fistulectomy / Fistulotomy	81	5.2
Circumcision	78	5.01
Amputation (all types)	70	4.5
Haemorrhoidectomy	68	4.37

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Hydrocele repair	42	2.7
Soft tissue tumor excision	40	2.57
Pilonidal sinus surgery	32	2.06
Others (see rare conditions below)	41	2.64

Fig. 3a: A case of Interstitial Type of Post Appendectomy Incisional Hernia

Fig. 3b: Debridement case

Additionally, representative clinical images of operative cases are presented to illustrate the spectrum of procedures managed in the department. Fig. 3a demonstrates a case of post-appendectomy incisional hernia, a frequent sequela encountered in general surgical practice, highlighting the importance of meticulous closure techniques and long-term follow-up. Fig. 3b depicts an extensive debridement case, reflecting the burden of infective and traumatic conditions that require urgent surgical intervention for source control and tissue preservation. Furthermore, Fig. 4 presents a case of laparoscopic cholecystectomy, emphasising the increasing trend and workload of minimally invasive procedures in tertiary centres, which offer the advantages of reduced hospital stay and faster patient recovery.

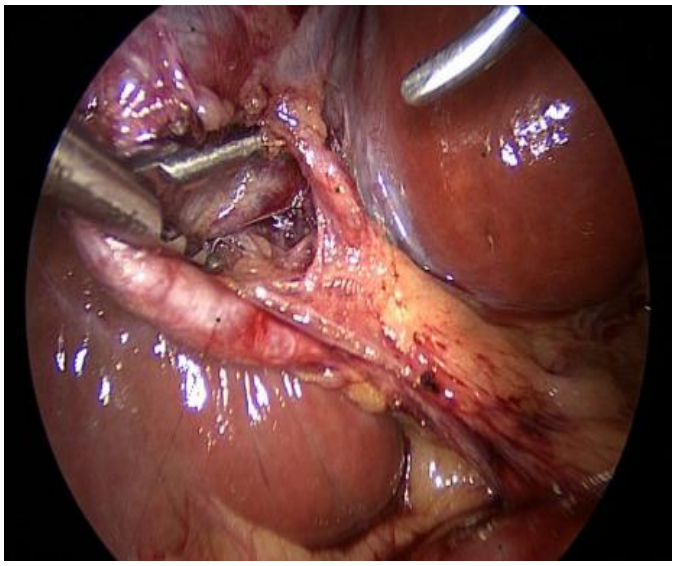

Fig. 4: A case of laparoscopic Cholecystectomy is shown

DISCUSSION

The present retrospective analysis aimed to evaluate the operative workload and surgical procedure patterns in the General Surgery Department of a tertiary care institution in Amreli. The findings provide a valuable insight into the surgical disease burden in the region and reflect the functional scope and capability of the institution's surgical services. This discussion contextualises the findings with national and international literature while addressing implications for healthcare delivery, training, and future research [12].

Our study revealed that the most performed surgical procedures included hernioplasties, appendectomies, cholecystectomies, laparotomies, and minor surgeries such as abscess drainage and soft tissue mass excisions. Hernioplasty emerged as the most frequent procedure, consistent with findings from several studies in rural and semi-urban India. In regions where physical labour is prevalent and access to early surgical intervention is limited, hernias often go untreated until they become

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symptomatic or complicated. This may explain the relatively high volume of hernia surgeries seen in our centre [13].

Appendectomies, both emergency and interval, formed another significant portion of the surgical load. This aligns with global data where acute appendicitis remains one of the most common causes of acute abdomen and emergency surgical intervention. The high incidence in our setup indicates the need for community awareness about early symptom recognition and timely presentation. Delayed diagnosis often results in perforation or generalised peritonitis, necessitating more complex surgeries such as exploratory laparotomies, another procedure that featured prominently in our study [14].

Cholecystectomy (Figure 6), particularly laparoscopic, also featured prominently. The growing burden of gallstone disease, likely driven by dietary changes, sedentary lifestyles, and metabolic syndrome, has contributed to increased cholecystectomy rates across the country. Although laparoscopic infrastructure may be limited in rural areas, our data shows that minimally invasive techniques are gradually being adopted in the Amreli institution, suggesting progress in surgical modernisation and capacity-building [15].

Emergency surgeries, especially those for perforation peritonitis and trauma, were significant contributors to the surgical caseload. These cases typically require immediate intervention and highlight the department's preparedness to handle life-threatening conditions. Perforation peritonitis often arises due to peptic ulcer disease, typhoid enteritis, or delayed diagnosis of appendicitis and intestinal tuberculosis, common in low-resource settings. A notable proportion of trauma surgeries reflects the increasing incidence of road traffic accidents and workplace injuries, especially in regions lacking stringent safety measures [16].

Anorectal surgeries such as haemorrhoidectomy, fistulectomy, and fistulotomy were also frequently observed. These procedures are relatively simple yet contribute significantly to the surgical volume, emphasising the ongoing need for proctological services in general surgery units. The high frequency may reflect chronic neglect or delayed consultation due to stigma or lack of awareness [17].

Minor surgical procedures like abscess drainage and soft tissue tumour excision serve an essential role in addressing localised infections and benign conditions. Their prominence in our findings underscores the dual role of the general surgeon, not only handling complex surgeries but also managing primary-level conditions efficiently [18].

A strength of this study lies in its ability to reflect the real-world surgical profile of a rural tertiary centre. In different large urban hospitals, where subspecialties may dilute the general surgery caseload, the surgical team in Amreli is likely responsible for a broader spectrum of procedures. This scenario provides a comprehensive training environment for surgical residents and interns, but it also highlights the need for continued professional development, resource allocation, and infrastructure support [19].

One major limitation of our study is the retrospective design, which is inherently constrained by the accuracy and completeness of hospital records. In addition, our study did not account for patient outcomes, length of hospital stays, postoperative complications, or readmission rates. Including such parameters in future studies would allow for a more detailed understanding of surgical quality and patient care standards [20].

The findings have several implications. Firstly, they need the funds for targeted health education in the community regarding early signs of surgical conditions. Secondly, there is a pressing requirement for improving emergency care infrastructure, especially for trauma and acute abdomen cases. Thirdly, expanding laparoscopic capabilities and staff training would greatly enhance patient care and reduce recovery times. Finally, establishing a standardised surgical audit system would improve documentation and help monitor performance metrics over time [21].

The operative patterns observed in the General Surgery Department of this tertiary institution in Amreli reflect a balanced mix of elective and emergency procedures, with a predominance of hernia repairs, appendectomies, and cholecystectomies. The data underscores the department's crucial role in managing a wide variety of surgical conditions in a resource-constrained environment. Deliberate investments in surgical infrastructure, training, and community outreach are essential for additional improving surgical care delivery in such surroundings [22].

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CONCLUSIONS

The study provides a comprehensive analysis of 1558 patients undergoing surgery, revealing a predominance of non-trauma-related elective surgeries. The most common diagnoses were hernias and appendiceal diseases. The diversity of diagnoses highlights the range of surgical care provided, emphasizing the need for efficient resource allocation in managing both common and rare conditions. The predominance of appendicitis and inguinal hernia within their respective categories suggests a significant need for specialised surgical services in general surgery. Less common but clinically important conditions, including thyroid malignancies, bowel obstructions, soft tissue tumours, and hydroceles, reflect the broad spectrum of surgical pathology requiring diverse diagnostic and operative knowledge. These answers emphasise the importance of evidence-based resource distribution, targeted surgical education, and initial detection methods, especially in low-resource or high-volume settings.

CONTRIBUTION OF AUTHORS

Research Concept- Dr Ravjibhai Masaribhai Jitia
Research Design- Dr Ravjibhai Masaribhai Jitia
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Materials- Dr Rahul Y. Patel, Dr Ravjibhai Masaribhai Jitia
Data Collection- Dr Rahul Y. Patel, Dr Ravjibhai Masaribhai Jitia
Data interpretation- Dr Rahul Y. Patel, Dr Ravjibhai Masaribhai Jitia
Literature- Dr Rahul Y. Patel
Writing Article- Dr Rahul Y. Patel
Critical value- Dr Rahul Y. Patel
Final approval - Dr Ravjibhai Masaribhai Jitia

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