

# Study of factors leading to cancellation of elective surgeries in a tertiary care hospital



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## ABSTRACT

**Background:** The postponement of elective surgeries is a major problem that increases the time for patients on surgical waiting lists and can negatively affect psychologically and physically to patients and their families. Cancellation rates reported within the literature are highly variable with considerable differences depending on type of hospital, national health care systems or policies, geographical region, patient population, providers, and also the perioperative management practices present at specific institution. **Aims and Objectives:** The current study was to thoroughly understand the causes to minimize such cancellations in our institute. **Materials and Methods:** A prospective observational study was conducted in the Department of General Surgery in a tertiary care teaching hospital in North India. All the patients admitted for elective surgeries in the Department of General Surgery over a period of December 1<sup>st</sup>, 2022–May 30<sup>th</sup>, 2023 were noted and out of them, details of patients in whom surgery was cancelled were taken and they were followed for 2 months. **Results:** Out of a total 1065 patients, 92 patients got cancelled during the study period. Out of them, 67 patients (67.8%) were cancelled on the scheduled date of surgery or after reaching operation theatre whereas, 25 patients (27.2%) were cancelled on day before scheduled date of surgery. Maximum number of cancelled patients were of cholelithiasis planned for laparoscopic cholecystectomy followed by inguinoscrotal swellings. Maximum number of patients were deferred due to administrative-related factors, followed by medical related factors. **Conclusion:** This study will act as a quality improvement initiative by reducing the surgery cancellation rate thus improving utilization of limited resources and valuable time to provide better health care services in our institute. Such cancellations can be minimized by better planning and active inter-departmental communication regarding proposed plan of surgery.

**Key words:** Health care; Cancellation; Surgery

## INTRODUCTION

The majority of hospitals in developed nations allocate significant resources toward the upkeep of operation theatres (OTs) and regular availability of surgeons and staff for planning of elective surgeries.<sup>1</sup> Cancellation of elective surgeries is one of the problems in delivering health services as it leads to resources wastage thereby increasing healthcare cost.<sup>2</sup> The number of cancelled operations and the reasons for them differ depending on the hospital, surgical specialty, and the health system in high-/low-/middle-income countries. It has been

seen that cancellation rates in low-and middle-income countries are higher than in high-income countries.<sup>3</sup> There are different reasons behind cancellations which may be related to patients, staff, and organization.<sup>4</sup> It is a major problem within many hospitals which leads to dissatisfaction of patients, prolonged patient stays in the hospital, and increased costs. It also reflects inefficiency in the management of the operating rooms.<sup>5,6</sup>

In a comprehensive quality improvement program, the rate of surgical cancellation is one of the quality indicators of any institute. Not much information regarding cancellation

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of elective surgeries is there from our institute. Hence, this study was planned to find out the various reasons leading to cancellation of elective surgeries, so that maximum benefit to the patients by making optimal use of Modular OT in our institute can be ensured.

### Aims and objectives

The aim of our study was to study the factors leading to cancellation of elective surgeries in the Department of General Surgery at a tertiary care hospital. The objectives were to study the incidence as well as factors leading to cancellation of elective surgeries and final outcome of the patients in whom surgery was cancelled.

## MATERIALS AND METHODS

An observational prospective study was conducted in the Department of Surgery, Postgraduate Institute of Medical Sciences, Rohtak, a tertiary care center in North India after approval from the hospital Ethics Committee vide letter no. BREC/23/541 dated October 18, 2023. All patients admitted for elective surgeries in the Department of General Surgery PGIMS, Rohtak were enrolled and details were taken of patients in whom surgeries got postponed/cancelled for a period from December 1<sup>st</sup>, 2022 to May 30<sup>th</sup>, 2023 and each patient was followed for next 2 months. Patients admitted for emergency surgeries, hemodynamically unstable patients, and patients who died before the surgery were excluded from the study.

To undergo an elective surgery, initially patient reported to outdoor patient department where diagnosis was made and primary pre-anesthetic checkup (PAC) was done and provisional date of admission was given to the patient after getting PAC accepted. Patient was admitted on given date in General Surgery ward and the patient underwent final PAC on day before the elective surgery as per OT list in Modular OT.

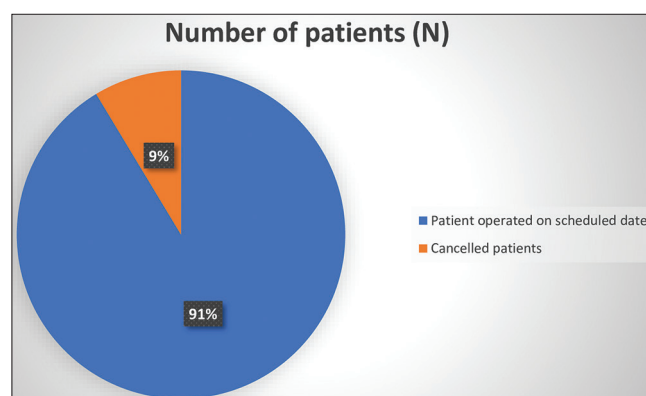
In the patients who fulfilled the inclusion criteria, basic information such as name, age, sex, address of patient, and a thorough history was taken, which included indication of surgery, associated comorbidities, and any history of previous surgery. Details regarding the reasons for postponement of surgery were taken. The reasons for each cancellation taking place were recorded in a predesigned pro forma. After the surgery was postponed, patients were telephonically called twice at an interval of 1 month to see the impact of cancellation, and the final outcome was recorded. The data were compiled and later analyzed using SPSS software (version 21.0 for Microsoft Windows; SPSS Inc.).

## RESULTS

A total number of patients scheduled for elective surgeries in the Department of General Surgery during the study period were 1065. Out of these 973 (91%) patients got operated on scheduled date and 92 (9%) patients could not get operated on the scheduled date due to some reasons (Figure 1). M: F ratio was 1:1, majority of people ranged from age group >60 years of age, followed by age group of 40–50 years and the maximum were from urban residency. Diagnosis of cancelled patients was cholelithiasis (28), followed by inguinoscrotal swellings (12) (Table 1). Maximum number of postponed patients were planned in general anesthesia (GA), that is, 63 followed by spinal anesthesia, that is, 28. Only one patient to be operated under local anesthesia was cancelled. Patients postponed on day of surgery were nearly three-fourth of all postponed patients as compare to one-fourth of patients who were postponed on day before date of surgery. Hypertension was found to be the most common associated comorbidity in postponed patients followed by poor chest condition however morbid obesity was the least common comorbidity present in postponed patients (Table 1). Maximum number of patients were postponed due to administrative-related factors (42) followed by medical related factors (35). Patients postponed due to patient-related factors were nine and some anonymous factors were also present in 6 patients (Table 2). Out of 92 postponed patients, 57 patients got operated in private hospital within a period of 2 months. Remaining nine patients got operated outside the institute, 16 patients remained unoperated, nine patients lost to follow-up and one patient expired during the course of the study (Table 1).

## DISCUSSION

In this study, factors associated with elective surgery postponement/cancellations and the reasons for these



**Figure 1:** Cancelled patients among all patients scheduled for elective surgery

Parameters	Frequency (n)	Percentage
Age		
<20	2	2.2
20–30	10	10.9
30–40	19	20.7
40–50	21	22.8
50–60	18	19.6
>60	22	23.9
Sex		
Male	46	50
Female	46	50
Place of residency		
Urban	50	54.3
Rural	42	45.7
Diagnosis		
Varicose veins	6	6.5
Inguinoscrotal swellings	12	13
Ventral hernia	6	6.5
Malignant disease of breast	5	5.4
Benign diseases of breast	4	4.3
GIT malignancies	7	7.6
Cholelithiasis	28	30.4
Benign diseases of anorectal region	9	9.8
Neck swellings	4	4.3
Others	11	12
Mode of anesthesia		
General anesthesia	63	68.5
Spinal anesthesia	28	30.4
Local anesthesia	1	1.1
Timing of postponement		
Day before scheduled date of surgery	25	27.2
On scheduled date of surgery/ After reaching OT	67	72.8
Associated comorbidities		
Diabetes	7	7.7
Hypertension	18	19.6
Cardiac disease	6	6.5
Immunocompromised	8	8.7
Morbid obese	4	4.3
Poor chest condition	11	12
Outcomes		
Got operated in same hospital	57	62
Got operated in other hospital	9	9.8
Not operated	16	17.4
Lost to follow-up	9	9.8
Expired	1	1.1

OT: Operation theatre, GIT: Gastrointestinal tract

postponements were identified and analyzed. Earlier researchers have compared the postponement of surgical cases due to unfavorable events that require regular monitoring due to its impact on the utilization of resources within the health system.<sup>1,7</sup> Moreover, this situation poses inconveniences and induces stress among patients, resulting in the loss of productive working days and the disturbance of their daily routines.<sup>2,8</sup> Every institution endeavors to attain recognition for its efficiency, yet a substantial percentage of cancellations for elective surgical operations pose a significant challenge in achieving this objective.<sup>3</sup>

Reasons	Frequency (n)	Percentage (%)
Administration-related factors		
Lack of staff	9	9.8
Lack of equipment	1	1.1
Shortage of operating time	28	30.4
Change in treatment plan	4	4.3
Total	42	45.6
Patient-related factors		
Fasting inadequate	1	1.1
Operative items not brought by patient	1	1.1
Patient abscond on date of surgery	6	6.5
Consent not given by patient	1	1.1
Total	9	9.8
Medical related factors		
Uncontrolled BP	11	12
Uncontrolled diabetes	5	5.4
ECG changes	3	3.3
Poor chest condition	7	7.6
Anemic	2	2.2
Deranged coagulable state	4	4.3
Patient not euthyroid	2	2.2
Lesions over operated site	1	1.1
Total	35	38
Anonymous factors (other miscellaneous causes)		
Pre-operative investigations unavailable	2	2.2
Undergraduates' exam	2	2.2
Primary PAC not done	2	2.2
Total	6	6.6

PAC: Pre-anesthetic checkup, ECG: Electrocardiogram, BP: Blood pressure

Rate of cancellation was 9.1% in our study. Cancelling elective cases on the day of surgery varies from low, that is, 1.96%<sup>9</sup> to very high, that is, 48.5%<sup>10</sup> and this depends on the healthcare facility available in a country and in an institute. In another study, 4060 elective surgeries were scheduled out of which 398 were cancelled on the day of surgery which yields that 9.8% of patients were postponed.<sup>11</sup> Although there are no definite studies for cancellation rates; however, hospitals with <5% cancellation ratio have been reported as an efficient.<sup>12</sup> This disparity among various studies may be attributed to sociodemographic factors, differences in sample size, research location, methodological discrepancies, sampling technique, duration, type of study and ineffective hospital administration practices. Our cancellation rate was relatively low and the probable reason for this is that our institute is a tertiary care hospital with good number of resources and all patients who were going to be operated, undergo a medical examination and evaluation by the anesthesiologist many days before admission, that is, Primary PAC.

There was no sex preponderance and majority of the patient were in age group of >60 years followed by patients

of age group 40–50 years. In another study, the highest rate of cancellations was observed among individuals aged 61–70 years old (31.1%), closely followed by the 51–60 years old group (25.4%).<sup>13</sup> This finding was similar with our result. Patients of old age are at high risk when subjected to surgical trauma and the hazards of general anesthesia requiring appropriate pre-operative control to prevent peri and post-operative complications thus leading to higher cancellation in old age.

Maximum number of postponed patients were from urban area as our institute is located in the heart of city and cater a lot of urban population. Similarly, the distribution of diseases totally depends on spectrum of diseases present in a particular area. Maximum number of postponed patients were planned for general anesthesia followed by spinal anesthesia and local anesthesia. Surgery planned under GA requires more optimization as compared to local/regional anesthesia. In addition, anesthetists usually do not prefer induction of patient under GA during later hours of OT timings as it requires more monitoring.

Maximum number of patients got postponed on the day of surgery or after reaching the OT. This highlights the role of proper planning and thorough evaluation of all cases planned for elective surgery. Few studies have reported a lower rate of cancellations after patients entered the operating room.<sup>14,15</sup> This suggests that some of the cancellations could have been prevented as the most common causes of cancellation on the day of surgery were administrative followed by some patient-related factors. However, on the day before surgery, cancellations were mainly due to patient related factors. A previous study on cancellation of surgeries on the day of surgery has also highlighted role of potentially avoidable administrative-related factors.<sup>16</sup>

Most significant comorbidity found was hypertension and poor chest condition which was consistent with the findings of previous studies as hypertension in both pre-operative and post-operative period increases the incidence of cardiovascular and cerebrovascular hemorrhage and mortality.<sup>16</sup> In another study, the author also reported that the presence of comorbidities had a direct impact on postponement of patients.<sup>11</sup>

It was found that maximum reasons for cancellation were administrative followed by medical and patient-related factors. The results of our study were concordant with studies in other countries,<sup>17-20</sup> however, percentage among different studies may differ due to methodological differences and type of organization (Government/Private). The most common administrative cause was the lack of time to perform surgery. The probable cause for

this is overloaded OT list with fixed time schedule in a government hospital. In addition, the time interval between cases was influenced by the patient's successful recovery from anesthesia. Although there is no fixed number of procedures ideal for an operating room, coordinating surgical and anesthetic assessments during scheduling can reduce the number of cancelled elective cases due to time constraints on the day of surgery.<sup>18,21</sup>

Medical related reasons were higher than other studies<sup>20,22</sup> which was because our institute is a referral center for high-risk surgeries. Among patient-related reasons main reason was that the maximum number of patients absconded on date of surgery. In a similar type of study, patients not attending to their scheduled surgery were the major reason of cancellation (35.5%) of elective surgical operations at a teaching hospital in Sudan.<sup>22</sup>

Patients not coming for surgery as a cause of postponement were reported by many studies at different rates.<sup>6,23,24</sup> Social obligations and events (death or wedding of a family member) were common reasons that prevent Indian patients from attending to their planned surgery. It can be minimized by good scheduling, which involves the patient in selecting the date of their surgery and by timely communications and reminding of the patients.<sup>1,23,24</sup> Anonymous factors depend on the type of hospital (Government/Private) and patient profile.

It was seen that the majority of the patients 57 (62%) got operated later on in the same institute followed by patients who couldn't be operated, lost to follow-up and expired. As there is scarce literature on outcome of postponed patients, therefore it is the need of hour to address and assess this issue in more coming studies to validate our results, determining outcome, and to provide a proper solution for the same.

The strength of our study is that this is the first study of its kind in an apex referral and teaching hospital in Haryana. The results of our study will ultimately help in quality improvement in care of surgical patients in the institute. Our study also included follow-up information of postponed patients which has not been previously studied in the literature.

#### Limitations of the study

Limitations of our study are that it is a single-center study and its results cannot be generalized. Our research included only general surgical patients and other super specialty surgical patients were not included in the study. The results of our study are reflection of postponement in government public hospital only whereas results in private hospitals could entirely be different.



## CONCLUSION

Based on the results of our study, we conclude that administration-related and medical related factors are the predominant cause of cancellation of elective surgeries. The causes for the cancellations identified in our study are potentially preventable. Better coordination and communication between anesthetists and operating surgeons along with better planning can reduce a significant number of cancellations. More in-depth analysis of reasons behind cancellations and identification of avoidable root causes will improve OT efficiency.

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**Authors' Contributions:**

**SV, GK**- Implemented the study, collected data, wrote the manuscript; **SV, SKY**- Developed study protocol, supervised implementation of study; **GK, AV, LSSL**- Implemented the study, contributed in writing of manuscript.

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