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Short Communication

Surgery Cancellation on the Day of Surgery: A Report from an Academic Center in Northern Iran

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Abstract

Background: Cancellations of elective scheduled surgeries on the intended day is a major problem for healthcare organizations with significant negative outcomes for patients and hospitals. This study aimed to investigate the rate and the reasons for day of surgery cancellations at an academic center in the north of Iran.

Methods: This retrospective single center study was conducted at Amir-al-Momenin Hospital, a referral and academic center in Guilan, Iran, during 2018-2022. A detailed review of a total of 187 cases canceled was performed. A responsible medical student filled out a checklist including type of surgery, patients' age, ASA class and the cause of cancelation.

Results: From 41900 cases, 187 surgeries were canceled representing a cancelation rate of 0.46%. The most common reason for cancellation was "change in the patient's clinical condition" by 59.1%. The other reasons were 'patient refusal' 8%, 'lack of correct timing for elective surgeries' 7%, and 'Technical problems in operating room facilities and equipment and unavailability of surgeon/surgeon's opinion' 5.3%. 'Insufficient paraclinical tests' and 'lack of anesthesia pre-operative visits' 0.5% had the least frequency among the reasons of cancelations.

Conclusion: The rate of day of surgery cancelation was low (0.46%). The majority of causes of cancelations were due to patient-related issues, particularly changes in patients' clinical condition on the scheduled day of the operation. Process improvements need to be considered continuously to further decrease in cancelation rate.

Keywords: Anesthesia, Hospitals, Surgery, Operating rooms

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Introduction

Same day cancellations of elective surgeries as a major problem have adverse consequences on both patients' families and hospitals. It negatively affects the patients both physically as worsen their health conditions and psychologically including dissatisfaction, disappointment and anger (1). Following the cancellation of the operation, patients may also suffer from occupational and family problems. They may travel long distances after waiting a long time for surgery, and may have rearranged their life plans and taken time off from work, only to have surgery. Hence, cancelled surgery at the last minute can be a disaster for them. In terms of the hospitals inefficiencies, the cancellations, in turn, disrupt the continuity of the workflow and increase the costs and surgical waiting lists (2,3).

By searching the literature, the rates of surgery cancellation have been reported as a wide range from 3.9% to 40% (4,5). Reasons of cancelation are usually patient related such as being not optimal status for surgery or patient refusal, facility-related factors including insufficient Operating Room (OR) time or lack of Intensive Care Unit (ICU) beds, or other reasons such as wrong booking. However, studies have shown that most of them could be preventable (6). However, to avoid such cancellations, it is first necessary to fully understand the reasons for their occurrence.

In addition, any cancellation should be treated as an adverse event, and the sequence of reasons that led to the cancellation should be documented (7). The aim of this study was to investigate the incidence of elective surgery cancellations at a single, referral, academic hospital across ophthalmic and Ear, Nose and Throat (ENT) surgical services, to identify the most common causes of cancellation.

Materials and Methods

After the approval of the Ethic committee of Guilan University of Medical Sciences (GUMS), this retrospective single center study was conducted at Amir-al-Momenin Hospital, a referral and academic center in Guilan province Northern Iran, during 2018-2022. It has outpatient surgical ward, ICU, and seven operating theaters for ENT and ophthalmic surgeries and provides both emergency and elective procedures.

The required data of the scheduled and canceled surgeries were sorted out from the OR records. The canceled cases were defined as the booked case, documented on the OR list, which was canceled on the intended day of surgery. A detailed review of a total of 187 canceled cases was performed to find the rate and the reasons of cancelation. During the study period, all the scheduled surgeries which were not performed on the day of surgery were documented. A responsible medical student filled out a checklist including type of surgery, patients' age, ASA class and the reasons for cancelation. The data were analyzed by SPSS version 21. Categorical variables have been presented as frequencies and percentages.

Ethical considerations

The study protocol was approved by the Research Ethics Committee of GUMS; IR.GUMS.REC, 1402.441, and all the patients' data were anonymized prior to analysis.

Results

Over the study period, from 2018-2022, 41900 cases were scheduled, of which 187 surgeries were canceled representing a cancelation rate of 0.46%. Patients' demographic data are presented in table 1. The highest reported cancelation rate was recorded in 2018 (28.34%) and the lowest in 2019 (13.90%). Various reasons of cancelation are shown in table 2. 59.1% (111) of the reasons for cancellation were "change in the patient's clinical condition", 8% (15) were "patient refusal", 7% (13) were due to "lack of correct timing for elective surgeries" and 5.3% (10) were due to "technical problems in operating room/facilities and equipment" and "absence of surgeon/change of surgeon's opinion". 3.4% (8) of the reasons were "not stopping prohibited drugs before surgery" and "other causes" each 2.1% (4) for "absence of necessary consents" with 1.6 % (3) for "inadequate fasting time " as well as "lack of ICU bed. "Insufficient paraclinical tests" and "lack of anesthesia pre-operative visits" 0.5% (1) had the least frequency among the reasons for cancelation.

Discussion

In order to find solutions to reduce the number of cancellations, it is very important to understand the

Table 1. Individuals' demographic characteristics type of cancelled surgeries

Year of admission / Variables		2018	2019	2020	2021	2022	Total
Gender	Female	35(66%)	18(69.2%)	16(51.6%)	11(32.4%)	28(65.1%)	108(57.8%)
	Male	18(34%)	8(30.8%)	15(48.4%)	23(67.6%)	15(34.9%)	79(42.2%)
Age (year)	Mean±SD	55.84±17.26	48.26±21	53.8±25.59	58.35±20.15	56.18±20.74	54.98±20.65
ASA class	I	7(13.2%)	7(26.9%)	9(29%)	5(14.7%)	5(11.6%)	33(17.6%)
	II	13(24.5%)	15(57.7%)	8(25.8%)	15(44.1%)	18(41.9%)	69(36.9%)
	III	33(62.5%)	4(15.4%)	14(45.2%)	14(41.2%)	19(44.2%)	84(44.9%)
	IV	0(0)	0(0)	0(0)	0(0)	1(2.3%)	1(0.5%)
Type of surgery	Ophthalmic	40(75.5%)	12(46.2%)	23(74.2%)	27(79.4%)	28(65.1%)	130(69.5%)
	Nose	8(15.1%)	10(38.5%)	6(19.4%)	7(20.6%)	9(20.9%)	40(21.4%)
	Ear	0(0)	0(0)	0(0)	0(0)	1(2.3%)	1(0.5%)
	Throat	5(9.4%)	4(15.4%)	2(6.5%)	0(0)	5(11.6%)	16(8.6%)

Table 2. Reasons for surgery cancellation by year

Year of admission / Reasons for cancellation	2018	2019	2020	2021	2022	Total
Change in patient's clinical condition	32(60.4%)	14(53.8%)	20(64.5%)	24(70.6%)	21(48.8%)	111(59.1%)
Patient's refusal from surgery	3(5.7%)	5(19.2%)	2(6.5%)	3(8.8%)	2(4.7%)	15(8%)
Lack of operating room time	7(13.2%)	2(7.7%)	0(0)	0(0)	4(9.3%)	13(7%)
Equipment failure	1(1.9%)	0(0)	2(6.5%)	1(2.9%)	6(14%)	10(5.3%)
Unavailability of surgeon/surgeon's opinion (change in the surgical plan)	2(3.8%)	4(15.4%)	1(3.2%)	1(2.9%)	2(4.7%)	10(5.3%)
Not stopping prohibited drugs before surgery	3(5.7%)	0(0)	4(12.9%)	1(2.9%)	-	8(3.4%)
Absence of necessary consents	0(0)	0(0)	1(3.2)	2(5.9)	1(2.3)	4(2.1%)
Inadequate fasting time	1(1.9%)	0(0)	1(3.2%)	0(0)	1(2.3%)	3(1.6%)
Lack of ICU bed	1(1.9%)	0(0)	0(0)	1(2.9%)	1(2.3%)	3(1.6%)
Insufficient paraclinical tests	0(0)	0(0)	0(0)	0(0)	1(2.3)	1(0.5%)
Lack of anesthesia pre-operative visits	0(0)	0(0)	0(0)	0(0)	1(2.3)	1(0.5%)
Other causes	3(5.7%)	1(3.8%)	0(0)	1(2.9%)	0(0)	8(3.4%)
Total	53(100%)	26(100%)	31(100%)	34(100%)	43(100%)	187(100%)

causes of cancellations as the first step. It is also vital to repeat and analyze the cancellations periodically, since the causes may change over time (8). In this retrospective study, the reasons for the cancellation of surgeries in Amir-al-Momenin Hospital were investigated. The most common reasons for cancellation were related to the change in the patients' clinical status on the day of surgery, and the least causes were insufficient paraclinical evaluations and failure to perform a pre-operative anesthesia visit. At a glance, it seems that the main reason for cancellation of surgeries in this center might be unavoidable. In such a way that, for a patient who has undergone all the necessary examinations, but shows symptoms of a cold on the day of operation, cancellation is inevitable. On the other hand, it can indicate a long interval between pre-operative anesthesia visits and the time of surgery. This issue often occurs in patients with concomitant diseases and older ages. For example, a patient with a history of high blood pressure or diabetes receives necessary consultations and reaches ideal clinical conditions.

However, if there is a long-time gap between this process and the time of surgery, it is possible that the patient's clinical conditions will change and therefore, not being in an optimal status on the intended day which presents an avoidable process. The case that happened only once in the five years of study period and accounted for the lowest percentage was the lack of pre-operative anesthesia visits indicating the accurate supervising system on patients' preparation process in this center. The next reason for the cancellation was incorrect booking and lack of operating room time. This reason is unavoidable in some situations. It is clear that in a center with a large number of emergency surgeries, including the Gynecology, Obstetrics and Trauma Centers, unplanned emergency surgeries can disrupt the operating room schedule. On the other hand, a private center where all anesthetic and surgical procedures are performed by specialists is different from a medical training center whose mission is to train the assistants, hence there is a higher possibility that the set operation list will not be completely in accordance with the surgeries performed that day. In Amir Al-Momenin teaching hospital, residents from both disciplines should be given the opportunity to acquire the necessary skills by spending enough time under the supervision of the specialists.

Therefore, there is a possibility that the surgery and anesthesia process will exceed the expected time and some operations will be canceled due to lack of time. The next rank in the causes of cancellation was related to technical problems in the facilities and equipment of the operating room, which is classified as one of the avoidable causes. The next causes with a lower percentage were the lack of necessary consent and insufficient fasting time, which can be avoided with more careful supervision and responsibility of the nursing team. The lack of ICU bed was mentioned as one of the unavoidable reasons for cancellation. Other reasons for cancelation, were non-discontinuation of the drugs that should not be taken until the day of the surgery, and cancellation based on the opinion of the surgeon or the lack of presence of the surgeon for various reasons. Cancellation due to the absence of the surgeon or the opinion of the surgeon on the day of the operation also needs to be reviewed and criticized. Factors such as non-implementation of medication orders, non-observance of fasting time and the lack of necessary informed consents were associated with the nursing. The failure of the operating room equipment was related to the operating room manager and the technical manager of the hospital.

The anesthesiologist was responsible for insufficient para clinical tests and not performing anesthesia visits. Inappropriate booking and changing the opinion about the required procedure and absence of the surgeon were items related to the surgeon. These results show that in order to minimize the cases of canceling the operation and actually limit it to the unavoidable cases, the coordination and responsibility of the medical team, including physicians and nurses is important. Regarding the variables related to the cancellation, age of the patients has been reported to be influential. Thus, at the age of over 75 years, 68% of the reasons for cancellation were changes in the patient's clinical conditions. Meanwhile, the reasons for cancellation demonstrated no significant relationship with the type of surgery, ASA class and gender. Although in the case of ASA class III, most of the causes of cancellation were deterioration of patient's clinical conditions, the difference was not significant. This finding indicates that in older patients

and higher ASA classes, it is necessary to consider a minimum time interval between the preoperative visit and the time of surgery. In the following, the results of some studies in Iran are mentioned. According to a systemic review in Iran, the most important reasons for cancellation of surgeries were associated with the operating room and the hospital, in this regard the length of previous operations and insufficient operating room time were the most common causes. The other dominant cause was due to the change in patient clinical status resulting in cancelation by the responsible anesthesiologist. Failure to attend the surgeon on time was determined as the other common reason. In another similar study, patients' unsuitability for surgery, lack of operating room time, on-compliance with instructions and problems with equipment were reported as the main reasons for cancelation. Proper preoperative anesthesia visits and improved communication between medical team and patients were suggested to reduce the cancellation rate (9-13).

In a retrospective and non-randomized study conducted in a large ophthalmology center, 59,959 operations were performed and 10,004 operations were canceled. The most common reasons for cancellation were patient refusal (38.42%), patient's health status (18.79%) and surgery rescheduling (15.27%). Female gender, black race, patient age less than 50 years, non-cataract surgeries, higher average income, type of insurance were associated with a significant increase in the rate of cancellation (14). A consecutive series of Total Shoulder Arthroplasty (TSA), patients in two university hospitals were investigated. Ninety-eight of 1189 patients (10.2%) were cancelled of which 49.0% were on the same day of operation. The most common reasons for cancellation were due to the patient's clinical condition (45.8%), anesthesia-related factors (27.1%), and infection (40.9%). Fifty-four percent of anesthesia-related cancellations underwent additional diagnostic and therapeutic intervention, despite the fact that 100% of those patients received a preoperative visit (15). In a study conducted at the Obstetrics and Gynecology Center of GUMS, 3.3% of cases were canceled and the main reason for cancellation was the lack of ICU beds (16). In a retrospective review at an academic center, Tayeb showed that 7.3% of procedures were canceled, 91% of which were before the day of surgery, while 9% of them were on the same day. The main reason for cancellations was incomplete consultations with the required medical fields (17). Studies have demonstrated that the causes and factors related to the cancellation of surgeries in each hospital are different from other centers. In fact, this issue is the justification for the fact that it is necessary to carry out such research in each center independently, and it is not possible or practical to generalize the results of other studies. The reasons can be unique due to socio-economic and cultural differences in different areas (1). For example, in Saudi Arabia, the number one reason for cancellation was unavailability of surgical consultants (17) while in India, it was lack of operating room time (18) and in Ethiopia, it was patient-related reasons (19). It also should be noted that the characteristics of each hospital, such as whether it is private, public, general, single specialty, educational, or referral, affects the results. The pattern of surgeries and the percentage emergency and unexpected surgeries that interrupt the booked cases are also very important. For example, in a private center, where all the anesthesia and surgical procedures are performed by a specialist, thus much differ from an academic center.

Limitations

The reported results of this research are based only on surgeries that were booked and canceled on the same day. However, it should be noted that the definition of "cancellation of elective surgery" is a much more comprehensive term, and if we could document the cases that were scheduled for a certain date but were not operated at that time, the results would be different. Of course, it could not be done due to the retrospective nature of the study. Also, due to the same reason, a possible percentage of the missing of complete information can be expected.

Suggestions

According to the reasons of cancellation of surgeries and related factors in this hospital, it is suggested that a comprehensive planning be done including hospital officials, specialists, and nursing, in order to eliminate the avoidable causes. In this regard, comparing the results of a prospective study with the current research

will discover how practical and effective this research was to reduce the cancellation rate.

Conclusion

In summary, low cancelation rate of 0.46% in the same-day of surgery was recorded. The majority of causes of cancelations were due to patient-related issues, particularly changes in patients' clinical condition on the scheduled day of the operation. The reported low cancelation rate does not mean that more efforts are not needed to improve the process. In contrast, the avoidable reasons should be eliminated by continuous accurate planning.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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