

Day Care Surgery in Tertiary Level Hospital

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ABSTRACT

Day care, surgery was started as a money-saving modality. It has picked up momentum even in India. In the last one decade due to innovations in surgical techniques and advances in anaesthesia, the positive feedback from the patients and their relation has enhanced the popularity of day care surgery. There is an immense opportunity for expansion of day care surgery in India to ensure faster, safer, cost-effective and patient turnover. Retrospective and Prospective day care, surgery was being performed on general surgery patients at the National Institute of Medical Science and Hospital (NIMS), Jaipur from 2014 to 2017. During this period, 4547 day care, surgical procedures and 2757 OPD procedures were performed. Only 212 day care, surgery patients (2.9%) were transferred to day care unit as in-patient admission. We found, the day care surgery as a safe and effective means of fast track surgery, which was economical also. In-patient admission following day surgery can be reduced by improved out-patient selection of cases by introducing a pre-admission assessment form filled in at the out-patient clinic, operating early on day care by using separate day care theatre. Anaesthetic complications were reduced by the increased use of local anaesthetic techniques.

Key-words: Ambulatory surgery, Anaesthesia, Day care surgery, Early Ambulation, Laparoscopy, Post-Operative

INTRODUCTION

Over the past three decades, day surgery rates have steadily increased in many countries around the world. The benefits of day care surgery have been increasingly perceived by the medical professionals, health policymakers, health care providers and patients. The process has been facilitated by developments in medical technology, surgical skills, the advent of new anaesthetic agents and techniques and improved methods of analgesia^[1].

Day care surgery as a concept has been well established in developed countries but still in its infancy in developing countries such as India. Results of survey conducted across 19 countries in 2006 showed an extremely wide variation in the percentage of day cases

among countries, with <10% in Poland and over 80% in the United States and Canada^[2]. Despite bearing 20% of the world's disease burden, India has only 6% of the world's hospital beds. Hospital beds per 1000 population in India are <50% of that in developing countries such as Brazil and China and <35% of the world's average^[3].

With a population of 1.2 billion and recent huge expansion in the private sector, there is an immense opportunity for expansion in day-care surgery in India^[4].

The procedure that can be undertaken as day care surgical procedures is as per the British Association of Day Surgery (BADs) which came up with a basket of '25' surgical procedure to provide a more consistent measure of performance. BADs later recommended inclusion of another fifty procedures under the name of Trolley procedure^[5].

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Table 1: Potential benefits of day care surgeries

Patients & Families	Hospitals	Health Care Systems
<ul style="list-style-type: none"> • More personalized care • Recovery in a family home environment • Avoid complications from prolonged hospitalization (infection & DVT) • Low complication rate • Better outcome • High patient satisfaction 	<ul style="list-style-type: none"> • Cost – 20% to 75% less than that of similar inpatient procedure. • Reduced requirements of nursing & medical supervision • Each of scheduling for patients and surgeons. • More number of patients can be treated 	<ul style="list-style-type: none"> • Curtailing costs while obtaining high quality • Accessible and effective treatment • Government insurer, Health authorities or individual patients

MATERIALS AND METHODS

The place of study was at the Department of Surgery, National Institute of Material Sciences (NIMS) Jaipur,

Rajasthan, India. The data were collected comprising of patients that operated during the period from January 2014 to December 2017.

Table 2: Patient selection criteria

S. No.	Descriptions
1	Age – More than 6 months and less than 70 years.
2	Medically fit and stable patient (ASA I, II, III (Well controlled)).
3	Well motivated and psychological / mentally stable.
4	Availability of toilet, transport, telephone and responsible relation at home.
5	Ability to eat-drink within reasonable time scale.
6	No expected interruption of blood supply to major organs.

Table 3: American Society of Anaesthesiologists (ASA) - New Classification of Physical Status

Classification	Physical Status
Class 1	The patient has no organic, physiological, biochemical or psychiatric disturbance. The pathological process for which operation is to be performed is localized and does not entail a systemic disturbance.
Class 2	Mild to moderate systemic disturbance, caused either by the condition to be treated surgically or by other pathophysiological processes.
Class 3	Severe systemic disturbance or disease, from whatever cause, even though it may not be possible to define the degree of disability with finality.
Class 4	Severe systemic disorders that is already life-threatening, not always correctable by operation.
Class 5	The morbid patient who has little chance of survival but is submitted to an operation in desperation.

Table 4: Exclusion Criteria for Day care surgery

S. No.	Descriptions
1	ASA grade beyond III or more.
2	Obesity (BMI > 35), Hypertension not controlled (Diastolic > 100 mm Hg).
3	Surgery requiring more than two hours.
4	Surgery with anticipation of major fluid loss/blood cell need but operative critical case.
5	Preterm babies and infant less than 6 months.
6	Patient living in far and not easily reachable or able to transport easily/difficult access to the house (too many stairs to the front door).
7	Mental retardation / unstable psychiatric illness.
8	If proper care giver is not available.
9	Uncontrolled diabetes, alcohol abuse, chronic obstructive pulmonary diseases (COPD), marked dyspnea on mild exertion, severe asthma, epilepsy.
10	Pregnancy.
11	Medically unfit for discharge on the same day.
12	History of angina at rest, myocardial infarction, severe hepatic disease > Renal failure on dialysis, etc.
13	History of complication with anaesthetics and certain drugs e.g. Warfarin.

Table 5: Patient Preparation

S. No.	Descriptions
1	Examination and diagnosis.
2	Investigation (Haemogram, Blood Sugar, HIV, HBsAg, Urine, Stool, X-ray Chest, USG, ECG).
3	Medical fitness (Physician, Cardiologist/ Diabetologist / Anaesthesiologist).
4	Four hour fasting except in laparoscopic surgery.
5	Bowel preparation, when required (Laxatives, enemas).
6	Advised pre-operative medications (Inj. Tetanus-Toxoid, Antihypertensive, to stop Aspirin at least 2 days before surgery),etc.
7	The use of Alprazolam or any oral mild sedative given on previous night, to help in reducing the anxiety of the patient.
8	Cessation of Warfarin and antiplatelet drugs.

Anaesthesia Used- Local anaesthesia in most cases along with some form of sedation, if necessary: pudendal, ring, field, inguinal, scrotal cord and costal. General Anaesthetic (For major surgical only) these would include diagnostic laparoscopies, laparoscopic/ laparoscopic assigned/ appendectomy, cholecystectomy assisted mesenteric lymph node biopsy, laparoscopic varicocele surgery. Mainly used were short acting drugs and

intravenous sedation (Midazolam, small dose of ketamine).

Scheduling of Operation List- Major Procedures were scheduled early in the morning to allow maximum recovery time. The patient required local and regional anaesthesia was taken in the afternoon.

Table 6: General Instruction to Fit Patients

S. No.	Descriptions
1	Asked to bring your old prescription, if any.
2	Asked also bring all medications in their original containers.
3	Patient was asked also to bring the X-ray, CT scan, MRI Scan, ultra sound scan report, laboratory reports, etc.
4	Advised to bring one attendant with you.
5	It is preferable to come on an empty stomach. Do not eat and drink anything except for water from mid-night.
6	If the patient takes regular medication for certain conditions like high blood pressure, Diabetes, etc. he was given specific instructions at the time of his pre-admission visit as to which one he should take, on the day of his surgery.
7	It is important to be on time on the day of his surgery. The time between his arrival and the actual time of the surgery will allow nursing to complete the necessary paper work. Administrating pre-operative medications, tests and starting of an intravenous, if required.
8	Patient was advised to share all the medical information with the doctor and nurses e.g. relation to medicines, anaesthesia, difficulty in hearing, etc.
9	The patient will be asked to change for surgery and once ready and will be duly called and before surgery.
10	Consent for surgery will be taken from the patient and also the attendant prior to surgery.
11	After surgery, the patient will be shifted to the post-operative ward for few hours.
12	The doctor will prescribe the medications and post-operative care.
13	It is important that all the post-operative instructions are followed correctly.

Table 7: Discharge criteria of Patients

S. No.	Descriptions
1	Vital signs stable for at least one hour.
2	Correct orientation to time, place and person.
3	Adequate pain control with supply of oral analgesic.
4	Understands how to use the oral analgesic supplied.
5	Ability to dress and walk, where appropriate.
6	Minimal nausea, vomiting or dizziness.
7	Has taken oral fluids.
8	Minimal bleeding or wound drainage and patient do not require dressing change.
9	Has passed urine (if appropriate).
10	Has a responsible adult to take them home.
11	Has a career at home for the next 24 hours.
12	Written and verbal instructions given about post-operative care.
13	Knows when to come back for follow up (if appropriate).
14	Emergency contact number supplied.

On Discharge- Follow up by telephone in 12 hours, 24 hours and 48 hours. It was done by day care centre (preferably by nurse, surgeon or anaesthetic) as a mandatory (Table 8).

Table 8: On Discharge of Patients

S. No.	Descriptions
1	Written instruction.
2	Verbal instruction, procedure specific information.
3	Contact number of all our team including the operating surgeon. In case of any questions and complications.
4	Instruction given on how to look for complications and its management, patient was informed about one or two episodes of possible development of vomiting post operatively due to anesthesia which usually subside eventually.
5	Follow-up appointment date was given for suture and dressing removal, if required.
6	Given adequate home medication (especially analgesics) with information leaflet.
7	Information was given on when to resume other regular medications.
8	Instructed regarding duty resumption, driving and alcohol consumption, sexual activities and exercise.
9	Sick certificate, if needed.
10	I.V. cannula removed, if any.

RESULTS

Day care surgery was performed on 4547 patients including 726 endoscopic procedures and 2757 office surgical procedures were done. Only 212 (2.9%) day surgery patients were subsequently required transfer to the appropriate ward for post-operative care. Out of the 212 patient's surgical complications developed in 109 patients (51.42%) and 103 patients (48.58%) developed anaesthetic complications. Haemorrhage, 44 patients had to be hospitalized for secondary bleeding to be managed conservatively. However, no transfusion was given. Appendicectomy, 7 patients had to be hospitalized and managed conservatively. Bilateral Hernia, only 4 patients had to be admitted due to excessive sedation and drowsiness. Thirty patients did not pass timely urine. Most of these were cases of circumcision, perineal surgery, diagnostic cystoscopy etc. In eight patients,

extensive surgery was required. Out of 212 patients, 103 patients had anaesthetic problems. Total of 66 patients (64%) had nausea and vomiting, which was controlled by ondansetron or droperidol. Total of 30 patients had severe drowsiness and dizziness (29%). They were not deemed fit to go home, therefore, required overnight stay. Two patients had difficulty in the airway due to trauma by endotracheal tube. Therefore, they were kept under observation. We have not discussed those patients who were fit to be discharged but refused due to long distance of their home or fear of complication or there being no medical facility, in their town. Table 9 shows the surgical procedure done at day care centre. Table 10 shows office procedure done at the day care centre and Table 11 shows the complication, which occurred and the patient required on admission.

Table 9: Day Care Surgeries

S. No.	Type of Procedure	Number of Cases
1.	Breast	
	• Lump Excision	142
	• Simple Mastectomy	10
	• Sentinel Node Biopsy	2
	• Gynecomastia Excision	35

2.	Hernia	
	• Inguinal	402
	• Femoral	1
	• Umbilical	43
	• Incisional	7
3.	Hydrocele	52
4.	Varicocele– Laparoscopic/Open	64
5.	Orchidopexy	49
6.	Orchidectomy	12
7.	Vasectomy	115
8.	Circumcision	90
9.	Bronchial Cyst	4
10.	Amputation	46
11.	Haemorrhoidectomy	1532
12.	Fistula in ANO	210
13.	Fissure in ANO	150
14.	Pilonidal Sinus	32
15.	Lymph Node Biopsy	165
16.	Varicose Vein Ligation/Stripping	76
17.	Appendicectomy– Laparoscopic/Open	162
18.	Cholecystectomy– Laparoscopic/Open	232
19.	Diagnostic Laparoscopy	319
20.	Gastroscopy Banding	410
21.	Supra Pubic Cystostomy	52
22.	Diagnostic Cystoscopy	130
23.	Hypospadias Repair	130
	Total	4547

Table 10: Office Procedure

S. No.	Type of Procedure	Number of Cases
1.	Toe Nail Excision	91
2.	Lipoma Excision	252
3.	Sebaceous Cyst Excision	212
4.	Dermoid Cyst Excision	42
5.	Neurofibroma Excision	62
6.	Corn Excision	82
7.	Wart Excision	96
8.	Papilloma Excision	12
9.	Piles– Sclerotherapy	772
10.	Ganglion Excision	46
11.	Amputation	52
12.	FNAC	206
13.	Ascitis/Pleural Tapping	21

14.	Biopsy- Lymph Node	96
	Muscle Biopsy	2
	Testicular Biopsy	6
	Skin Biopsy	8
15.	Abscess Drainage	640
16.	Urethral Dilatation	59
	Total	2757

Table 11: Reasons for in Patient Admission in 212 Patients from Day Care Surgery

Surgical Complication (51.42%)		Anaesthetic Complications (41.58%)	
	No. of Cases		No. of Cases
Haemorrhage	44	Nausea & Vomiting	66
Extensive Surgery	8	Drowsiness & dizziness	30
Excessive Sedation	6	Difficult Airway	2
Elevation & observation of limb	12	Epileptic	1
Not voiding urine	24	Caudal Epidural injection	4
Urinary Catheterization	6		
Further investigation	9		

DISCUSSION

Mention of earliest day care surgery is noted as early as the beginning of 19th century by James Nicoll (1,10) a Glasgow Surgeon, who performed almost 9000 outpatient operations on children in 1903. Case procedures were published in 1909. A decade later in 1916, Ralph Waters published results from Iowa (USA) providing day care surgery for dental and minor surgical procedures. In 1990, the audit commission published a basket of 25 procedures ideally suited for day surgery. The BADS added further 17 operations in their "trolley of procedure" and this is continuously expanding and updated to a "directory of procedures" since 2006 which is now (in its fourth edition) contains 200 procedures across all surgical specialities.

In India the concept of day care came in the year 2003 and first national conference of day surgery was held in 2005 and a hand book of protocols of day surgery was released by Row [6]. But in India, this facility is available in metropolitan cities and a few other centres. Up to 2009, night stay at the hospital was essential for mediclaim but later on, insurance Regulatory Development Authority (IRDA) realized the importance of day care surgery and disclosed a list of 147 procedures covered by mediclaim. This has given a boost to day care surgery.

Definition of day care surgery has varied from country to country. Day care surgery patient is discharged within 23 hours (USA), while in U.K. It is surgery without night stay. Day surgery means patient is fit to return home within 23 hours without an overnight stay. Ambulatory surgery means patient's recovery after surgery and returns home on the same evening. Office surgery means patient recovers from surgery and returns home in few hours. Outpatient surgery is different from day care in which the patient is not fully assessed in outpatient surgery, only minor procedures are done with that.

Day care surgery demands the highest standard of professional skill and organization. Although the operation could be minor, anaesthesia is never minor. The success of day care surgery is dependent on several relevant factors which include patient selection, patient information, pre-operative assessment/test, proper anaesthetic and post-operative care, patient acceptability and audit [7]. In our experience, the most important criterion for patient selection for day care surgery was the approximate duration of surgery. Next in importance is clinical status, comorbidities and surgery up to 2 hours.

Till the year 2000, selection criteria for the patient having Thoracic and Abdominal cavities involvement were not included, but the rapid expansion of minimum access technique in surgery over the last 20 years has offered many possibilities for converting a surgical procedure from an inpatient to day care. In minimum access surgery, there is minimum tissue damage, less oedema, lessor bleeding and less post-operative pain. Quality of anaesthetics and analgesic has markedly improved and procedures up to two hours long can be performed on the day care basis provided they are scheduled early in the day.

Modern advances have shaped the practice of anaesthesia in modern day care surgeries. These include the introduction of propofol, which offered rapid onset and recovery, reliable hypnosis and antiemetic properties and the development of halogenated inhalational agents which allowed rapid induction and emergence from general anaesthesia; reduced incidence of PONV and excretion independent of liver and kidney. Post-operative pain and nausea, vomiting are the main problems in day care surgery. For pain, currently multi model, opioid sparing, balanced analgesia strategy is used, particularly paracetamol combined with NSAID for super analgesia^[8]. The patients who are prone or having PONV were given multi model combination therapy includes 3-HT Antagonist (ondansetron with either Dexamethasone or droperidol^[9]). Although, other anaesthetic complication observed were drowsiness, dizziness, non-specific headache, postdural puncture headache, asthenia, myalgia and sore throat etc.

Suprabha Surgicare (USA) research has found that day care surgery is now a global trend and over 70% of elective surgery in the USA is done this way. Also, studies worldwide have shown that day care surgery delivers the same high quality care of what is given in hospital in-patients. Infact, research has shown that day care surgery centres are actually safer than in-patient. Day care surgery is economical as well. On an average, research conducted in the USA has shown that procedure at day care centre cost 50% less than those in the indoor patients. In UK, a saving of 40% in cost has been reported with day care surgery. The estimated expenditure in a postgraduate institute of medical education and research in Chandigarh is Rupees 1000/per bed/day. Subrabha Surgical reported

complication related to surgery to be less than 1% of the time in outpatient setting.

In-patient admission represents failure of day care service 'an' ogg^[10] in Cambridge reported a hospital admission rate of 0–2% for the year 1984-1986. Which is remarkably low and Goulbourn reported an admission rate of between 3% > 5% so there is a great variation. The incidence of hospitalisation reported by Natof in the USA varied from 0.6% to 4%. In our study it is 2.9%, which coincides with the literature available.

Thompson *et al.*^[11] treated 2039 patients in day care surgery and of those 105 (5%) required in patient admission. 17% did not fulfill the criteria. For day surgery, 46% had surgical problems and 35% anaesthetic associated problems.

Mulchandani and Begani^[12] from Bombay Hospital performed 4506 surgical procedures, 3998 OPD procedures and 1393 endoscopic procedures during 10 years. They reported day surgery is safe, effective means of economic and fast track surgery.

Kamana *et al.*^[13] did day care laparoscopic cholecystectomy at tertiary health centre in north India and mentioned the maximum duration stay as 8 hours in all, 309 patient of day care laparoscopic cholecystectomy.

Dinesh *et al.*^[14] studied about shift stay in laparoscopic cholecystectomy. They found that out of 211 patients from day care laparoscopic cholecystectomy, 201 patients could be discharged within 6 hours. Mean operation time was 72 minutes. No patient required admission. No patient needed conversion to open surgery. He concluded that shift stay day care laparoscopic cholecystectomy is feasible and acceptable.

Susa *et al.*^[15] did laparoscopic appendicectomy at federal teaching hospital in Gombe. Successful laparoscopic appendicectomy was done in 21 patients. There was no conversion to open. Mean operation time was 34.2 minutes. The mean recovery period was 181 minutes (3 hours) and mean hospital stay was 22 hours.

Thus, the popularity of day care surgery continued to grow owing to its greater patient number, lower staff, surgical cost and more personalized care. In recent studies, ambulatory surgery had been determined as safe with rare major morbidities and seldom re-admission requirements. Over all, patient satisfaction has been shown to be high. The main cause of

re-admission or delay after day care surgery has been nausea, vomiting or uncontrolled pain.

CONCLUSIONS

It is rapidly an emerging field in surgery in different specialties. It reduces cost, mental agony of patient and family members. Minimal hospital stay makes it more acceptable to the patient. There is an urgent need for increased awareness of day care surgery amongst the medical as well as non-medical fraternity. This can be achieved by proper sharing of information on day care procedures with general practitioner, and other referring doctors regarding careful selection and motivation of patients. Patient needs no hospitalization and able to have early ambulation. Skilled Surgery and meticulous follow up ensures good results in day care surgery, which are comparable and even superior to hospitalized surgery due to the personal touch. In India, the lack of hospital beds, long waiting list, expensive health care system, lack of government funding to private sector of health care etc., day care surgery appears to be the only answer for the future.

CONTRIBUTION OF AUTHORS

Research Concept- Surendra Kumar Kala

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