

Day Care Laparoscopic Appendectomy

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Abstract

Appropriate accreditation, safe anesthesia protocols, and proper patient selection constitute the basis for safe and efficacious day care laparoscopic appendectomy. Day care surgery has several potential benefits over hospital-based surgery, including cost containment, ease of scheduling, and convenience to both patients and surgeons. To demonstrate the feasibility of laparoscopic appendectomy in a day-care setting, a prospective, nonrandomized study was conducted at Vijay Hospital and Day Care Surgery Centre, Chalisgaon and Santosh Day Care Surgery centre, Nashik during a period of 66 months, from May 2009 to Oct 2014. A standard anesthetic, analgesic and antiemetic protocol was used. A total of 600 patients underwent laparoscopic

appendectomy under general anaesthesia. Mean age of patients was 22 years (range 05–60 years). Most patients were mobilized within 2 hours after surgery. There were no post operative complications. 220 (36.8%) of them were selected for outpatient laparoscopic appendectomy and all (100%) were discharged from hospital on same day of surgery. All cases were discharged within 24 hours of surgery with average length of stay of 16 hours (380) patients. There were no re-admissions in my study. All the patients were happy about early discharge. Day care laparoscopic appendectomy under general anesthesia is feasible and safe and can be practiced in uncomplicated cases of appendicitis. Patients find it acceptable and it appears safe.

Keywords: Day care surgery, Day care laparoscopic appendectomy.

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Introduction

Day care surgery is defined as ambulatory surgery, wherein, the operated patient recovers from surgery and is fit to return home within a day (24 hours).

Day care surgery allows a person to return home on the same day that a surgical procedure is performed. In an overnight stay unit (23-hour admission unit), operated patients are observed overnight but discharged next morning, within 23 hours of surgery. This course overcomes the arbitrary limit to reimbursement as an outpatient procedure.

An ideal setting for day care surgery would be hospital based, supported by well equipped operation theatre, recovery room, postanaesthesia care room and specially trained staff. In addition a strong social backup with satisfactory transport and telecommunications system and involvement of family physician is desired.

Day care laparoscopic surgery has developed over the past 3 decades for a number of following reasons: Improved surgical instruments, less invasive surgical techniques, a team approach in preparing a person for surgery and home recovery that involves both a surgeon and an anesthesiologist, newer anaesthesia practice and newer anaesthesia drugs allowing patients to recover faster, technology has offered sophisticated monitors to monitor patients more carefully during anaesthesia, modern painkillers provide better postoperative analgesia and the desire to reduce health care costs.

Acute Appendicitis is one of the most common conditions requiring surgical intervention and afflicts one in seven individuals. Laparoscopic techniques are increasingly used for surgeries that traditionally have required open approaches. A German Gynecologist, Kurt Semm first performed laparoscopic appendectomy in 1981 and since then laparoscopic appendectomy has struggled to prove its superiority over the conventional open surgery. Advantages of laparoscopic appendectomy include improved wound healing, better cosmesis, reduced post operative pain and ultimately earlier discharge from hospital. There are large series of studies showing

that laparoscopic appendectomy is safe and scores over open appendectomy.

Materials and Methods

A prospective, nonrandomized study was conducted at Vijay Day Care Surgery Centre, Chalisgaon and Santosh Day Care Surgery Centre, Nashik during a period of 66 months, from May 2009 to Oct 2014.

600 consecutive patients with a clinical diagnosis of acute appendicitis were included in the study. Acute Appendicitis was diagnosed on clinical examination, Ultrasonography of abdomen / pelvis and lab investigations. Patients with uncomplicated appendicitis were considered for day care laparoscopic appendectomy. Details regarding the day care procedure and anaesthesia were explained to the patient. Written informed consent was obtained from all the patients.

Criteria for case selection were cases with recurrent, sub-acute, acute and chronic appendicitis. Only non-toxic, medically fit and stable {ASA I & II}, well motivated, psychologically / mentally stable patients, accompanied by competent and responsible relative or care taker were selected in the study. Patients with appendicular lump and perforation were excluded from the study.

Elective cases were admitted early morning and operated as first case. 220 cases were operated electively as first case and tried for same day discharge. Emergency cases with acute appendicitis and acute pain were operated on emergency basis after work up on the same day of admission. These emergency cases (380) was operated later in the day.

All the patients underwent laparoscopic appendectomy under general anesthesia. A standard anesthetic, analgesic and antiemetic protocol was used. The protocol included premedication with Ondansetron and Dexona as emetic agents and Midazolam as sedative and anxiolytic agent. Induction was done by Glycopyrrolate i.v., and Fentanyl (3 micro gm /kg) i.v., and Propofol (1-1.5 mg/kg) i.v. Relaxation was rendered by Atracurium (0.3-0.5 mg/kg) i.v. Maintenance was done with O₂, Nitrous oxide gas and Isoflurane. Atracurium and Fentanyl

were given when required. Regular monitoring of hemodynamic parameters including pulse rate, blood pressure, oxygen saturation, and electrocardiogram was done. ETCO₂ was monitored. Surgical approach included three ports (one 10 mm and two 5mm). If required blunt dissection was done to identify the appendix. After ligation of base, appendix was divided and delivered through 10 mm umbilical port. The stump was cleaned. Bupivacaine 0.5 % is instilled in the peritoneal cavity. Peritoneum was deflated, trocars were removed and the port incision was closed aseptically. Paracetamol and Diclofenac were used intravenously as per requirement. Postoperatively patient was monitored for vital parameters, postoperative complications, morbidity, duration of hospital stay, and complications in follow-up. Intensity of postoperative pain was recorded on the Numeric Pain Rating Scale. The patients were asked to make pain ratings corresponding to current, best and worst pain experienced during the hospital stay period. Ratings of pain intensity were 0 for no pain, 1 to 3 for mild pain, 4 to 6 for moderate pain and 7 to 10 for severe pain.

All the patients were ambulated as soon as possible. Oral fluids were started within two hours of surgery.

Criteria for discharge:

- (a) Stable vital parameters
- (b) No new signs or symptoms after the surgery
- (c) No nausea or vomiting
- (d) Mild tolerable pain.
- (e) Passed urine
- (f) No surgical complication
- (g) Able to walk comfortably without assistance.
- (h) A responsible escort.

Overnight stay was considered in cases where recovery was not proper, patient had complications like excessive pain or vomiting, or the hours was too late in evening, and social issues (issue of transport or family not willing to go home).

All patients were provided a set of instructions regarding diet, activity, medication and wound care. Patients were asked to report in case of excessive pain, nausea / vomiting, constipation/diarrhoea, distension of abdomen, and discharge or redness at port sites.

Duration of surgery, length of stay after surgery, post discharge visit, readmission and complications were collated. Family physician was involved whenever possible. Patient was followed up on ninth postoperative day to remove the sutures and a follow-up interview was recorded.

Observations and results

All 600 patients with uncomplicated appendicitis were found eligible for discharge and were discharged within 24 hours of surgery. All 220 patients selected for same day discharge and operated electively as first case in morning were successfully discharged from hospital on same day with average length of stay of 6 hours (range 5 to 8 hours). The average length of stay for the remaining patients was 16 hours (range 15 to 22 hours). The average operating time was 45 minutes. (Range 30 to 75 minutes). There was no significant effect of duration of surgery regarding postoperative complications and duration of ambulation after surgery. All patients were mobilized within 2 hours after surgery. Oral fluids were started within 2 hours of surgery in all the cases.

There were no intraoperative complications. There were no significant postoperative complications except for pain. Post operatively all patients had mild tolerable abdominal/shoulder pain, (Numerical pain rating score 1-3).

There were no re-admissions in my study.

All the patients were followed up on ninth postoperative day and sutures/staples were removed. During follow-up all patients complained of mild pain (Score 1-3 Numeric rating scale) for 2 days. All patients returned to full routine activities within 7 days.

All the patients were happy about early discharge.

All patients were satisfied with the information given and aftercare provided. All would recommend it to a friend or relative and would undergo the procedure as a day case again.

Discussion

Day care surgery is now a global trend. More than 60% of surgical procedures in the United States are currently performed as outpatient surgeries. Health experts expect this percentage will increase to nearly 75% over the next decade. In the UK, the NHS plan, published recently predicts that 75 per cent of elective surgical procedures will soon be conducted as day cases.

Also studies worldwide have shown that day care surgery delivers the same high quality care as that given to hospital patients. In fact, research has shown that day care surgery centers are actually safer than hospitals.

Day care surgery is economical as well. In USA a saving of 15-30 % and in UK a saving of 40% in the cost has been reported with the day care surgery.

Appropriate patient selection lowers the failure rate. Patients with ASA grade 1 and 2 are ideal for selection in Day care surgery. I followed the same and this resulted in successful adaptation of DCLA in 100% of patients. In my study, unplanned readmission or follow-up rate was zero. This was possible due to proper case selection.

In the study of Schrieber, 78 cases of acute and sub acute appendicitis were tried for outpatient laparoscopic appendectomy. Cases with severe sepsis or peritonitis were excluded. Five postoperative complications (4 cases of peritonitis and one case of stump insufficiency) were found and treated by laparotomy[1]. In the study by Brosseuk and Bathe, two (4%) of the fifty-two patients who underwent laparoscopic appendectomy had significant complications, one of them required reoperation for intra-abdominal abscess. Thirty- nine (75%) of the laparoscopic appendectomies were done as day care procedures[2]. Alvarej and Voitk found that there were no readmissions for wound infections or postoperative abdominal abscesses. They concluded that over -half of patients with appendicitis can be managed as outpatients without jeopardy to outcome[3]. In the study of Akhlak Hussain, thirty patients of acute appendicitis were tried for outpatient laparoscopic appendectomy. 87 % patients were discharged on same day of surgery and 13% patients were discharged on the next day. There were no significant postoperative complications except for tolerable pain in all patients and mild to moderate nausea in 80% cases (4). In the present study, 220 cases out of 600 cases (36.66%) were selected for outpatient surgery and all 220 (100%) were discharged on same day of surgery and there were no significant complications except for mild tolerable pain in all the cases.

The control of pain is crucial for the provision of good day-case anaesthesia. Good post-operative analgesia requires planning and a

multimodal approach[6]. Appropriate analgesia protocol is essential for successful discharge in Day care surgery. There is a trend away from opioid analgesics as they are associated with PONV (post operative nausea and vomiting) that results in patient dissatisfaction and delays discharge. Oral/parenteral analgesics have a higher success. Intraperitoneal instillation of 0.5% Bupivacaine and its local infiltration at sites of port entry provides adequate postoperative analgesia and minimizes the need of other analgesic support[7-8]. Paracetamol, Diclofenac and Bupivacaine were used in my study. All the patients had mild tolerable pain which was controlled by analgesics successfully.

For success of day care surgery, familiarity with the procedure is essential. My team has perfected the technique and has performed over 600 such procedures. Currently my mean operative time is 45 minutes (Range 30–75 minutes). In the study by Akhlag et al, operative duration was averaging 51 minutes (range 35–80 minutes) [5]. In the study by Alkhoury et al, the average operative time for laparoscopic appendectomy was 23 minutes (range, 6–61 minutes) in the same day discharge group versus 22 minutes (range, 10–77 minutes) in the overnight admission group[5]. In the present study, overnight stay occurred in cases with the length of operation lesser than the average duration. Thus, it can be concluded that in surgeries of duration less than a one and half hours, the duration of surgery does not significantly affect the timing of discharge[5].

Overnight stay is usually a joint decision made by the surgeon, the patient, and his attendants. As patient has to participate in self-care after discharge, their comfort, preference, and safety need to be considered in the assessment for discharge. In the above study, 380 patients stayed overnight because the hour was too late for discharge in (75%) and social reasons (25%). None of the patients was admitted for overnight for medical reasons. The higher rate of overnight admission due to social reasons explained the fear and lack of proper knowledge among the people of lower socioeconomic status which forms the main bulk of our patients. In the study of Alkhoury et al., 45 (out of 207) patients were admitted overnight because the hour was too late for discharge in 35(77.8%), medical indications dictated admissions in 5 (11.1%), and social reasons required admission in 5 (11.1%)[5].

Many series have documented a decreased incidence of postoperative complications and a decreased incidence of wound infection after laparoscopic appendectomy[9–11]. In my series, no patient developed any significant complication. Certainly, the laparoscopic approach facilitates the complete inspection of the abdominal cavity and identification of all septic foci or any significant pathology. Thus, laparoscopic approach increases the precision of diagnosis.

It has been suggested that, with increasing experience, the operative time required for laparoscopic appendectomy will decrease significantly[11]. The use of nondisposable laparoscopic equipment significantly decreases the cost of laparoscopic appendectomy. Laparoscopic appendectomy has a much shorter recovery time and the patients return to a productive life sooner, thus justifying laparoscopic appendectomy. Early return of productivity saved wages of 2-3 days. Overall, the DCLA is more cost effective from traditional inpatient cases in private setup where the hospital charges, bed charges and nursing charges are higher.

The findings of my study regarding the effectiveness of laparoscopic appendectomy as day care procedure are consistent with previous researches. My study demonstrated that day care laparoscopic appendectomy is safe with high success rate in carefully selected patients with uncomplicated appendicitis and has the advantages of cost effectiveness. Among the agents available in India, Propofol and Isoflurane/ Sevoflurane have increased the ability of the

anesthesiology to provide a successful day case experience. Because of the rapid onset and offset of these agents longer cases can be planned on an ambulatory basis and patients can recover quickly and can be discharged home safely. Side effects such as the “hang-over effect” can be minimized. Propofol has the additional effect of reducing PONV (post-operative nausea and vomiting)[12]. Use of Ondansetron and Dexamethasone in preinduction of anaesthesia minimizes the symptoms of postoperative nausea effectively[13-14]

There are a number of scoring systems to assess readiness for discharge. These use a variety of parameters such as level of consciousness, breathing, circulation, activity level, complications and mobility. A set of guidelines has also been set for such an assessment. It is also important to consider the patient’s mental state when discharge is considered. They should feel ready to go home. Discharging the patient against his/her wishes could have serious consequences.

Conclusion

Day care laparoscopic appendectomy under general anaesthesia is feasible and safe and can be practiced in uncomplicated cases of appendicitis. Patients find it acceptable and it appears safe.

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