

Early Feeding and Discontinuation of Intravenous Fluid After Laparoscopic Cholecystectomy

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ABSTRACT

Background: Common practice at most centers in the country is to continue intravenous (IV) fluid till morning round next day following laparoscopic cholecystectomy (LC), assess patient and gradually allow oral diet. However this seems unnecessary in view of fast recovery after minimal invasive LC. The aim of this study was to observe the prospects and assess the acceptability, safety and benefit of early oral feeding and discontinuing IV fluid after LC.

Methods: This cross-sectional observational study was carried out prospectively from Oct 1, 2009 to Sep 31, 2010 at Patan Hospital, a university teaching hospital. All elective LC patients were included. Oral liquid was introduced after four hours and IV fluid was stopped after six hr of LC. IV cannula was kept locked in situ. Vomiting, abdomen distension and reasons for continuation or resumption of IV fluids were recorded.

Results: During one year period 294 LC patients fulfilled study criteria. Average age was 40.8 years. Female accounted for 78.2%. Oral fluid was started in average of 5.5 hrs in 97%. In 3% (9/294) IV was continued. Postoperative nausea and vomiting was observed in 25.9% (76/294), of which 6.6% (5/76) required IV. There was no untoward affect after IV fluid was stopped.

Conclusions: Early oral feeding and discontinuing of intravenous fluid in laparoscopic cholecystectomy is safe, economic and well accepted by patients, family and nursing staff in Patan hospital.

Keywords: early oral feeding, intravenous fluids, laparoscopic cholecystectomy.

INTRODUCTION

Restriction of intravenous (IV) fluid in the postoperative period in uncomplicated patients of laparoscopic cholecystectomy (LC) reduces work load, saves cost and boosts patient's confidence of psychological wellbeing for oral intake and mobilization. This further reduces morbidity related to IV fluid, such as thrombophlebitis, retention of urine, and deep vein thrombosis. There are limited evidences on amount and duration of peri-operative fluid administration. Liberal administration of 1 to 4 liter is common in LC like in other major surgeries which may unnecessarily overload the patient.^{1,2}

In clinical practice, more variations are seen in fluid administration 'after' cholecystectomy. At our institute and most others in developing countries, day care LC is not a common practice. So, IV drip is continued till next

day morning round when patient is assessed and gradually allowed oral diet before removing IV drip. However, this practice seems unnecessary in view of rapid recovery and success of ambulatory LC. In this prospective observational study we examined the feasibility and safety of starting early oral feeding by four hours and discontinuing IV fluid six hours after LC in the local scenario of developing world with inadequate social infrastructure and healthcare facilities. We believe this change in practice will reduce IV fluid related morbidity, cut down cost, lessen demand on nursing care and will enhance patients' physical and psychological wellbeing.

METHODS

This cross-sectional study was carried out from 1st October 2009 to 31st September 2010 at Patan Hospital.

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Patients were prospectively observed and data collected in pre-designed proforma. Inclusion criteria were all symptomatic LC patients of ASA I and II (without diabetes) who gave consent for the study. Patients with complicated gall stones (cholangitis, choledocholithiasis and pancreatitis) were excluded from the study. The study was approved from the hospital authority. Patients were managed post-operatively in surgery ward as per our existing practice. All LC were performed under general anesthesia with endotracheal intubation. Immediately after completion of surgery patients were observed in post operative recovery area as per our routine practice. Patients were monitored in recovery area by paramedics and nurses under supervision of anesthetists for vitals (blood pressure, heart rate and SpO2) for a minimum of 30 minutes or till conscious and obeyed verbal command. Anesthetist compulsorily signed out patients for transfer to surgery ward.

In the ward, patients were monitored regularly for four hrs as per our existing practice and vitals recorded at intervals of 15 min (x4), 30 min (x2), 60 min (x2) and four hourly thereafter if stable. For post operative pain, Morphine 4 to 6 mg (0.1 mg/kg) and Phenergan 25 mg intramuscular four hourly as required together with oral Paracetamol 500 mg and Ibuprofen 400 mg (once oral feeding was started) were given. After four hrs of surgery patients were encouraged to start oral fluid, beginning with plain water and gradually increasing to full liquid. IV fluid was stopped after six hours or latest by 9pm on the day of surgery. The 9pm cut off time was taken keeping in view that some patients who had LC late in the afternoon were given at least four hours to start oral fluid before stopping IV drip. IV cannula was kept locked in situ in case of urgent need. Information on vomiting, use of anti-emetics and continuation or re-starting of IV fluid was prospectively recorded in pre-designed data sheet. Nurses were detailed about this change in practice of stopping IV fluid and early oral feeding following LC.

RESULTS

During one year 328 LC patients were enrolled in the study. Thirty four were excluded because of incomplete data, 19 lacked information on diet and 15 on IV fluid. Data of remaining 294 patients were analyzed. Average age was 40.8 years (range 10 to 88). Female were 230 (78.2%) (Figure 1). Oral fluid was started in average of 5.5 (range 4-9) hrs after LC, majority within 6 hr (Figure 2). Postoperative nausea and vomiting (PONV) was observed in 25.9% (76/294), of which 6.6% (5/76) required continued IV fluid (Figure 3). Metoclopramide 10 mg IV bolus was given to patients with PONV at the discretion of on duty doctors, when patients continued to vomit more than once. In 97% (285/294), IV fluid was stopped successfully, most within 6 hr (Figure 3). Among various reasons to continue IV fluid, two patients

had blood pressure of 100/70mmHg and 90/70 mmHg (Figure 4). None required re-establishment of IV line. There was no mortality in this series. All concerned, patients, family and nursing staff welcomed this change in practice.

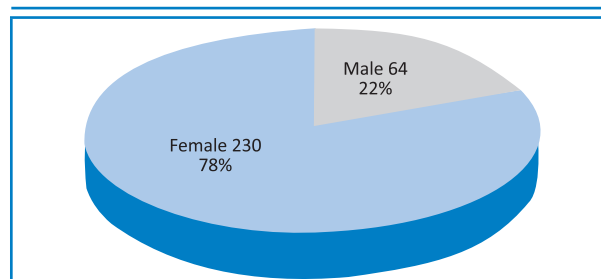


Figure 1. Female (78%) were predominant in this series of 294 laparoscopic cholecystectomy (LC).

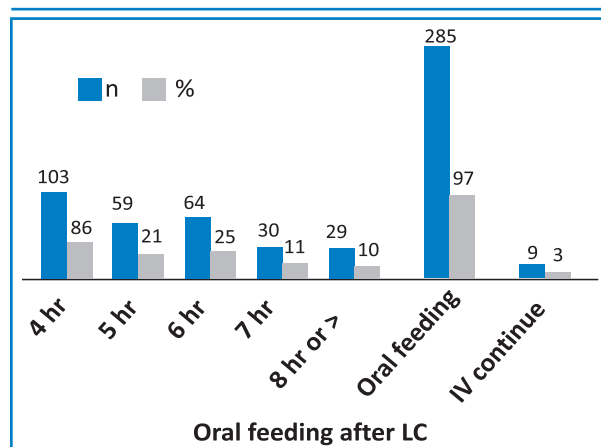


Figure 2. After LC 97% (285/294) patients tolerated early feeding, majority within 6 hr, only 3% required continued IV fluid.

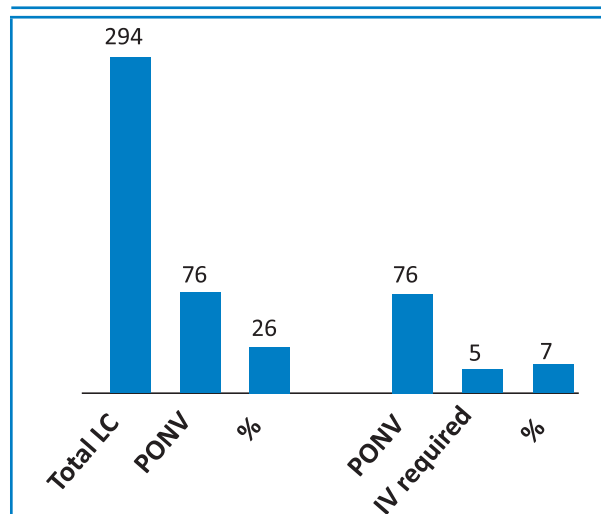


Figure 3. Post operative nausea and vomiting (PONV) was seen in 25.9% (76/294). Among PONV patients 6.6% (5/76) required IV fluid, 1.7% of total LC (294).

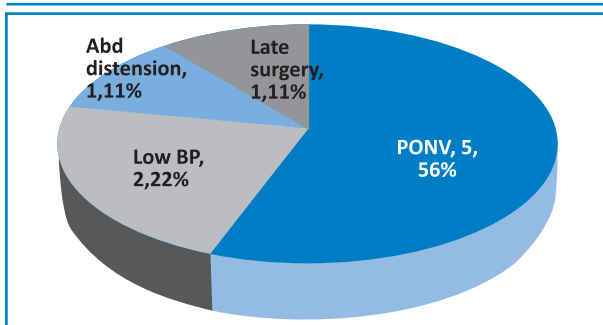


Figure 4: Reasons to continue IV fluid in 9 (3% of 294) LC patients: Abdomen distension (n=1) resolved spontaneously, Late surgery (n=1) was due to busy list.

DISCUSSION

In clinical practice, more variations are seen in fluid administration ‘after’ cholecystectomy. Traditionally IV fluid is continued for 12-24 hr after surgery; whereas recent trend is that of day case LC. Clinicians are reluctant to change age old practices despite development of new evidences.

Introduction of parenteral salt and water solutions in clinical practice has been a milestone in patient management. However, this is also the most ‘misused drug’. Early introduction of oral feeding when ever feasible should be preferred to minimize cost and morbidity related to infusion of IV fluid.³⁻⁵

Safety, cost saving and convenience to the patients should be the overall goal, and surgical management is no exception. LC has now matured. Increasing experience, proven safety and rapid post operative recovery has led to many modifications. Major bleeding is rare and when happens is usually detected during or within hours of surgery. Similarly, bile duct injury is either detected at the time of surgery or not until after several days later. After initial experience of ambulatory LC in the United States by Reedick in 1990, its feasibility and safety is now recognized in developing countries with less developed infrastructures. Ambulatory LC is now considered safe and economic with high level of patient satisfaction.⁶⁻¹¹

Fluid and electrolyte balance is important part of good clinical care. However, unnecessary use of IV fluid is by no means justified and careful maintenance of ‘internal milieu’ is necessary by not over or under hydration of the patients.

After trauma (and surgery) there is preferential re-absorption of sodium and water in response to circulating hormones such as anti-diuretic hormone (ADH) and aldosterone.¹² Body’s primary response for water and sodium is altered to ‘retain salt and water with water in excess’ due to metabolic and hormonal

response to surgical stress.¹³ This is the basis for caution in the amount of fluid administered post-operatively, as we observed in our cases with satisfactory recovery with no untoward effect by discontinuing IV drip following LC.

Fluid overload in peri-operative period has more detrimental effect on cardiovascular and pulmonary function¹⁴⁻¹⁶ because post-operative patient has a restricted ability to form hypotonic urine and to clear free water for the 48-72 hr ‘phase of injury’.¹⁷ Conservative approach is thus justified as long as we do not compromise the homeostatic balance.²⁻⁵ Literature has shown that early introduction of oral feed following moderate severity of abdominal surgery is feasible and safe.^{2,18} Most of our patients (97%) tolerated early oral feeding. We had PONV in 25.9% (76/294) of patients, most of which were self limiting and only 1.7% (5/294) required continuation of IV fluid. Thus our practice of not giving routine antiemetic to all LC is justified. We had one patient who complained of abdomen distension in immediate post operative period which resolved spontaneously. These findings of early oral diet resumption is in accordance to the observations in similar socio-cultural settings as reported from Pakistan, India and China in their attempt of day case LC.^{7,10,11} However, even in attempt to establish ‘outpatient vs inpatient LC’, Wu Ji et al from China recently reported “time to resume liquid food was 10.8 hours and semi-liquid food was 16.2 hours after the operation”.¹¹

Kumar et al in a prospective randomized clinical trial demonstrated that patients without postoperative IV drip and early oral feeding after cholecystectomy did equally well in comparison to the group with standard IV drip.⁵ Blair in 100 cholecystectomies had only IV lock for administration of anesthetic drugs without routine IV fluid. IV fluid was given in 8 patients for specific need (three jaundiced patients had Mannitol, one had Dextrose for diabetes control and 4 after trans-duodenal exploration of the common bile duct). Ninety-two patients who did not have a drip had shorter hospital stay without complications.¹⁹

Early oral feeding was advantageous to patients in our study in terms of psychological wellbeing and early mobilization as they were not bound to bed with IV drip. In our hospital, and most other resource poor developing countries, family member is responsible throughout the period of IV infusion to observe continuously and call nurses for change of bottle when it dries up. Financial saving is another benefit and all concerned-- patient, family, nursing staff welcomed this change in practice of discontinuing IV fluid with early oral diet. We hope to further expand our study of omitting IV fluid altogether after the uncomplicated cholecystectomy and exploring the possibility of day case LC in our setup.

We had no instance of post operative bleeding or other complications requiring re-surgery. In this series, among various reasons to continue IV fluid in nine patients, two had low blood pressure of 100/70mmHg and 90/70mmHg with normal pulse rate and haematocrit levels. This observation of blood pressure on lower side was probably due to post operative analgesia and we were over conscious to continue IV fluid as precautionary measure. We had one patient with late surgery due to busy operating list. This patient had continued IV fluid because there was not enough time to allow for oral feed after 4 hr of surgery, observe and stop IV by 9 pm cutoff time.

There was no complication in this series after early feeding and discontinuation of IV fluid after LC. We believe, stopping IV fluid is one more addition to the minimal invasive LC surgery, one more omission of source of IV related morbidity and one more strategy in cost saving for both patient and health institutions because these measures decrease nurses work-load and make more hospital beds available by preparing patient for early discharge.

CONCLUSIONS

Early oral feeding after four hours and discontinuation of intravenous fluid after six hours of laparoscopic cholecystectomy is safe, economic and well accepted by patients, family and nursing staff.

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