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Laparoscopy in the era of enhanced recovery



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A B S T R A C T

Laparoscopy is one of the cornerstones in the surgical revolution and transformed outcome and recovery for various surgical procedures. Even if these changes were widely accepted for basic interventions, like appendectomies and cholecystectomies, laparoscopy still remains challenged for more advanced operations in many aspects. Despite these discussion, there is an overwhelming acceptance in the surgical community that laparoscopy did transform the recovery for several abdominal procedures. The importance of improved peri-operative patient management and its influence on outcome started to become a focus of attention 20 years ago and is now increasingly spreading, as shown by the incoming volume of data on this topic. The enhanced recovery after surgery (ERAS) concept incorporates simple measures of general management, and requires multidisciplinary collaboration from hospital staff as well as the patient and the relatives. Several studies have demonstrated a significant decrease in post-operative complication rate, length of hospital stay and reduced overall cost. The key elements of success are fluid restriction, a functioning epidural and preoperative carbohydrate intake. With the expansion of laparoscopic techniques, ERAS increasingly incorporates laparoscopic patients, especially in colorectal surgery. However, the precise impact of laparoscopy on ERAS is still not clearly defined. Increasing evidence suggests that laparoscopy itself is an additional ERAS item that should be considered as routine where feasible in order to obtain the best surgical outcomes.

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Background to laparoscopy – evidence of impact on recovery

The widespread introduction of laparoscopy into surgery has been the only real revolutionary change in surgical technique in the last 100 years. It has transformed the way we operate and has transformed outcome and recovery for many common surgical operations. Although to many the improvements were immediately both dramatic and obvious it did not prevent an abundance of scepticism for nearly every operation into which the technology was introduced. This prompted research including randomized clinical trials to try and prove the superiority of one technique over another. It is unlikely however that these trials or their results really had any significant impact in slowing down the uptake of operations such as laparoscopic cholecystectomy. Other more complex operations have been introduced more gradually.

Common abdominal operations such as cholecystectomy, appendicectomy, fundoplication, inguinal hernia repair and even colorectal resection as well as less common operations such as adrenalectomy are being performed with hospital stays of less than 24 hours. There are few if any reports in the literature of this being achievable with open techniques in cholecystectomy, colorectal resection, fundoplication or adrenalectomy.

The first laparoscopic cholecystectomy was performed in 1987 by Mouret and is now the principal method in developed countries. An operation that was usually associated with significant post-operative pain and an average of one week [1] in hospital has been transformed into a day case procedure for uncomplicated cases. A publication looking at 356 patients demonstrated a median stay of three days for laparoscopic compared to 7.5 days converted and 9.5 days open with return to work of 21 days, 42 days and 56 days respectively [2].

Hesitancy in its adoption was more related to the apparent rise in bile duct injury than any real doubt surrounding its ability to improve recovery. Some authors questioned its superiority over the concept of ‘mini’ or ‘small incision open’ cholecystectomy but a randomized controlled trial of laparoscopy versus mini laparoscopic cholecystectomy as early as 1994 showed a hospital stay reduction of two days, return to work reduced by one week and similar complications in each group [3]. A systematic review [4–6] showed that both laparoscopic and mini cholecystectomy were better than open but was unable to differentiate outcomes between laparoscopic and mini cholecystectomy. Meta-analyses of mini cholecystectomy and laparoscopic cholecystectomy including 2032 cases revealed similar outcomes and a reduced hospital stay of 0.37 days [7]. The wound infection rate in open cholecystectomy was three times that of the laparoscopic approach. A Cochrane review of 38 trials including 2338 cases comparing open and laparoscopic revealed a three-day shorter hospital stay and reduced convalescence time with no significant differences in mortality, complications or operative time. It does appear that mini cholecystectomy can be performed with similar results to laparoscopic cholecystectomy but whilst laparoscopy is a suitable technique for patients with even the most challenging body habitus, mini cholecystectomy can be difficult and not universally applicable.

As far as other novel methods of minimally invasive cholecystectomy are concerned such as single port surgery (SILS) or natural orifice surgery (NOTES), it can be concluded that there are no adequately powered studies to assess the safety of these techniques and evidence would suggest that for SILS the time taken is longer, the blood loss is greater and the failure rate is significant [8], although some authors have reported an improved quality of life for single port surgery [9].

There are numerous reports of laparoscopic Nissen Fundoplication or its variants being performed as daycase [10]. In one UK study 100% of 20 cases were managed as a true day case with a mean post-operative stay of 6.5 hours. Prior to the advent of laparoscopy, studies revealed hospital stays with prolonged hospital stays predominantly for pain control, immobility and ileus in response to an upper midline laparotomy. Length of hospital stay has come down for open surgery too but cases series or trials of open surgery have all but disappeared from the literature. A meta-analysis of randomized controlled trials of open and laparoscopic fundoplication [11] revealed faster convalescence reduced complications and similar treatment outcomes although there was a higher reoperation rate in the laparoscopic group. A randomized controlled trial of open versus laparoscopic fundoplication revealed not only reduced hospital stay by two days but also a reduction in time off work from an average of 42 days to 28 days with a general reduction in complications [12].

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