



FROM STANDARD TO TRANSUMBILICAL LAPAROSCOPIC CHOLECYSTECTOMY – LEARNING CURVE AND PRELIMINARY RESULTS

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ABSTRACT

Background: Laparoscopic cholecystectomy (LC) is generally accepted as a standard treatment of cholelithiasis. However there are trends to further minimize surgical trauma and to improve cosmetic results by performing LC through a single transumbilical incision. The **aim** of this study was to evaluate the learning curve and early results of transumbilical laparoscopic cholecystectomy (TC) performed by a single surgical team. **Patients and methods:** between April'2009 and March'2010 52 consecutive patients with gallbladder diseases were operated by the same team using previously published original modification of the surgical technique. **Results:** TC was performed in 48 unselected consecutive patients. The mean age of the patients was 52yrs, 65% of the patients were females. According to the diagnosis 36 (75%) patients had chronic cholecystitis and 12 (25%) had acute cholecystitis. There were 2 (4%) conversions to standard LC and a single conversion to laparotomy (2%). The mean operating time was 79 min (range 40-120 min). **Conclusion:** TC can safely and rapidly replace standard LC in everyday surgical practice. The conversion rate of TC is comparable with the standard LC, but the operating time is still longer in TC.

Key words: laparoscopic cholecystectomy, transumbilical cholecystectomy, conversion rate, operating time

INTRODUCTION

Since more than 20 years the laparoscopic cholecystectomy (LC) has replaced the classic open cholecystectomy as an option for the surgical treatment of the benign diseases of the gallbladder. The first ever LC has been performed by Erich Mühe on 12.09.1985 (1). After 1987 the LC becomes more popular and often used thanks to the work of French teams - Mouret (who did the first video-assisted LC), Francois Dubois and Jacques Perissat. In the 90s LC became a standard, performed through 3 or 4 ports, placed at various points on the abdominal wall. In 1992 Pelosi reports a laparoscopic appendectomy through a single

skin incision, to be applied later on also in other abdominal operations. LC with several trocars inserted through a single incision becomes popular as "single incision laparoscopic surgery" (SILS) (2, 3, 4). Multi-channel ports were developed during the last years for performing these procedures. Navarra in 1997 and Piskun in 1999 report LC with a single transumbilical incision (5, 6). LC through single transumbilical incision gained popularity as transumbilical cholecystectomy (TC) (7, 8, 9, 10, 11, 12).

Even if being described comparatively long ago the transumbilical laparoscopic cholecystectomy has been applied recently to selected patients only. To be more widely used this technique should be optimised and studied within a larger number of patients and clinical situations. We aimed to study the results from applying the TC by a single team at a non-selected series of consecutive patients and with using our own-modified operating technique.

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PATIENTS AND METHODS

Up to April 2009 we have used the standard four-trocar laparoscopic cholecystectomy technique. Our study includes 52 consecutive unselected patients with calculous gallbladder disease, who have been operated from April 2009 till March 2010 by two surgeons (A.K. and A.J.) experienced in various laparoscopic procedures. We applied our own modified version of transumbilical laparoscopic cholecystectomy which was previously published (13). In brief – we use a single continuous incision within the umbilical folds, 2 ports placed trough the incision (one 10 mm and one 5 mm) and a single 10-mm 30° camera. The concept of retracting sutures through the abdominal wall was applied to achieve a good exposure of the gallbladder and triangulation. We transfixed the infundibulum of the gallbladder with 2 or 3 bites in a figure-of-eight fashion, with one end of the suture passed through the abdominal wall at the midline and the other at the anterior axillary line. This allows retracting the gallbladder in desired lateral direction by maneuvering different ends of the suture, thus greatly facilitating the exposure. When necessary, more retracting sutures can be passed in a similar way. This technique helps overcoming difficulties in exposure when adhesions or inflammation are present. The other steps of the procedure are similar to standard LC. In cases of large stones, we cut the fascial bridge between ports to remove the gallbladder and always close the fascia with sutures.

Four of the 52 patients have been excluded from further analysis as at the beginning of the above-mentioned period they were operated with a standard LC, without any attempt for a transumbilical access. The remaining 48 patients have been studied – in all of them transumbilical laparoscopic cholecystectomy was attempted by applying our own modification.

RESULTS

The median age of the patients was 52 years (range 21-79 years), 31 (65%) of them have been female and 17(35%) - male. The mean ASA score was 2.3 pts (range 1-4pts). Thirty-six of the patients (75%) had histologically confirmed chronic cholecystitis and 12 (25%) had acute cholecystitis. Within the acute cholecystitis group of patients 4 patients (33%) had simple acute cholecystitis whereas 7 patients (59%) had gallbladder empyema and

one patient had gangrenous inflammation. Within the chronic cholecystitis group 11 patients (31%) had severe peritoneal adhesions due to previous inflammatory attacks and four (11%) had hydrops of the gallbladder due to impacted stone at the infundibulum. There were 2 (4%) conversions to standard LC and a single conversion to laparotomy in a patient with Mirizzi syndrome (2%). The average operating time has been 79 min (range 40-120 min). There were no intraoperative complications.

DISCUSSION

The results of this study suggest that TC can be safely performed by surgeons experienced in laparoscopic surgery even in unselected cohort of patients. In our initial experience we did not attempt TC in four patients with severe comorbidity due to expected longer operating time (14). However with gained experience operating time dropped down to 40 min in uncomplicated cases. Our technique permits performing TC with conventional instruments without adding additional cost to the procedure. In contrast several different multichannel ports and/or specially designed instruments are used in most of the currently proposed techniques for TC. The latter ultimately add additional cost to the procedure. On the other hand our technique spares two ports and graspers used in standard LC, thus is more cost-effective compared with standard technique. Looking at the technical difficulties encountered during the procedure they are generally related to the anatomical changes caused by the disease. More than half of the patients within the chronic cholecystitis group had severe adhesions due to several inflammatory attacks, which makes dissection of the Callot's triangle and identification of the structures more difficult. However the safety of this dissection was not compromised with our technique, which was confirmed by the lack of intraoperative complications within the studied patients. The two conversions to LC were in patients with acute phlegmonous cholecystitis and gallbladder empyema at the first ten cases. Notably latter in the study there were no more conversions to LC even in patients with acute cholecystitis which was a good reference for the applicability of our technique. Looking at the operating time all the procedures lasting more than 100 min were performed in cases with complicated disease – impacted stones with hydrops of the gallbladder, severe dense adhesions or acute

cholecystitis. The cosmetic result was excellent in all of the cases as there were no scars left out the umbilicus.

In conclusion the results of the current study suggest that our technique for TC can rapidly and safely replace the standard LC in the everyday surgical practice. The longer operating time of TC was related with learning curve as in any other surgical procedure. The operation is simple and cost-effective when compared with standard LC. The main advantage of the TC remains the excellent cosmetic result leaving almost invisible scar within the umbilicus.

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