

# Totally transumbilical laparoscopic appendicectomy and cholecystectomy

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## Abstract

Single-port transumbilical laparoscopy, also known as embryonic natural orifice transumbilical endoscopic surgery (E-NOTES), has emerged as an attempt to further enhance cosmetic benefits and reduce morbidity of minimally invasive surgery. Here we report on two patients who underwent successful combined laparoscopic cholecystectomy and appendicectomy by totally transumbilical approach. Both cases were discharged on the 1<sup>st</sup> postoperative day without postoperative complications. Combined laparoscopic cholecystectomy and appendicectomy by totally transumbilical approach is feasible, safe and effective without any increased morbidity.

## INTRODUCTION

Single-port transumbilical laparoscopy, also known as embryonic natural-orifice transumbilical endoscopic surgery (E-NOTES), has emerged as an attempt to further enhance cosmetic benefits and reduce morbidity of minimally invasive surgery. Within a short span, several clinical reports have emerged in the urologic literature [1]. As this field is poised to move forward, a complete understanding of its evolution and current status is timely. There are several techniques described in the literature, though there is no standardization yet. We report the first two cases that underwent successful combined laparoscopic cholecystectomy and appendicectomy by totally transumbilical approach.

## CASE REPORT

First case: A 32-year-old female, a known case of symptomatic gall stone disease, presented to the ER one week before her scheduled elective laparoscopic cholecystectomy. She was referred with a one-day history of pain in the right lower quadrant (RLQ) of the abdomen. The pain was associated with nausea and mild fever.

The physical examination revealed a body temperature of 37.6°C and localized pain in the right iliac fossa (RIF), with signs of peritoneal irritation.

The white cell count was 9,500/mL, and hemoglobin 9.5g/dL. The abdominal ultrasound showed mild to moderate free fluid in RIF and pelvis, probe tenderness in the RIF, a

tubular adynamic thick-walled edematous structure in the RIF associated with adhesions, gall bladder (GB) stones with normal wall thickness and a normal common bile duct.

A diagnosis of acute appendicitis with symptomatic cholelithiasis was made.

Second case: A 24-year-old male presented with a clinical picture consistent with acute cholecystitis. The patient was admitted twice for pain in the RIF in the past. On both occasions, he was treated conservatively.

Decision was taken to remove appendix and GB in both patients. The patients were given metronidazole 500mg, cephadrine 1g, and pethidine 50mg intravenously. Laparoscopic appendectomy combined with cholecystectomy was performed with the patients under general anesthesia using a 5mm, thirty-degree laparoscope and a video camera system on the right side of the patients. Surgeon and first assistant were on the patients' left side. A 1cm incision to the right side and a 5mm incision to the left of the umbilicus were made. Pneumoperitoneum with CO<sub>2</sub> was created up to a pressure of 14 mmHg. An 11mm- and a 5mm-trocar were inserted (fig. 1).

**Figure 1**

Figure 1: 5mm- and 10mm-trocars are placed



Routine laparoscopy was done. The appendix was acutely inflamed in the first patient. The GB was found acutely inflamed and distended due to impaction of a stone at the neck in the second patient.

One silk stitch on a straight cutting needle was inserted into the peritoneal cavity through the abdominal wall in the RLQ. The stitch passed through the mesoappendix near the tip of the appendix. The needle was removed from the peritoneum and a silk thread was pulled upward to straighten the appendix (fig. 2).

**Figure 2**

Figure 2: Appendix within the loop



The mesoappendix was divided with the harmonic scalpel (fig. 3). A second 0-silk stitch on straight cutting needle was inserted into the peritoneal cavity through the abdominal wall in the RLQ; then the needle was removed after cutting. The base of the appendix was ligated with the 0-silk thread by intracorporeal secured knots by one instrument with Dowais's tie (fig. 4). Appendicectomy was done between the distal two threads and the appendix was placed in a

specimen bag for removal from the 11mm-port at the umbilicus.

**Figure 3**

Figure 3: Mesoappendix divided with harmonic scalpel



**Figure 4**

Figure 4: Ligation of the base of the appendix



A subcostal stitch was passed into the peritoneal cavity and a knot secured at the fundus of the GB, which was pulled anteriorly to expose Calot's triangle (fig. 5).

**Figure 5**

Figure 5: Fundal retraction by stitch.



Body and Hartmann pouch were pulled infero-laterally with the help of two more silk stitches (fig. 6).

**Figure 6**

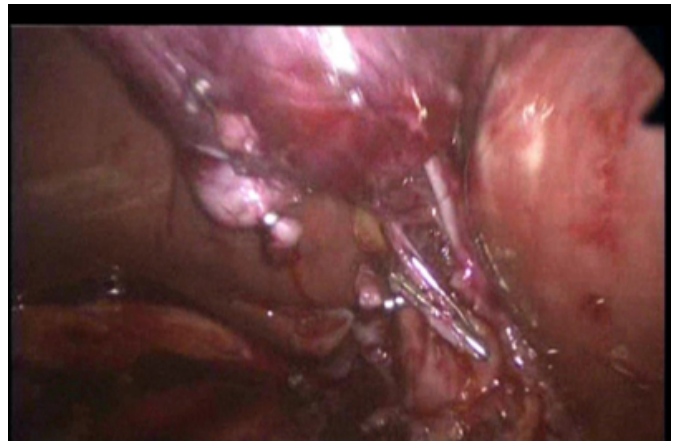
Figure 6: Gall bladder retracted by 3 stitches



Careful dissection was carried out. Cystic duct and cystic artery were isolated. The cystic duct was clipped with three medium-sized clips and divided between the distal two clips. The cystic artery was clipped before division (fig. 7).

**Figure 7**

Figure 7: Division of cystic duct and cystic artery



The GB was removed from the hepatic bed with the help of a diathermy hook using cutting current setting (fig. 8). The GB was removed from the 11mm umbilical port after placing it in an endobag.

**Figure 8**

Figure 8: Dissection of the gall bladder from the hepatic bed



Irrigation and suction was done in the hepatic bed. The abdomen was deflated and the trocars were removed. The wounds were closed. Marcaine was injected in the wounds. Total operating times were 125min. and 123min.

Postoperatively, the patients were kept “nil orally” for four hours. Afterwards they tolerated oral fluids well. Patients were given intramuscular diclofenac sodium 75mg for pain control. They were discharged on the 1<sup>st</sup> post operative day. Histopathology showed chronic cholecystitis and an acutely inflamed appendix in the first and acute cholecystitis and lymphoid hyperplasia of appendix in the second patient.

## **DISCUSSION**

The journey from conventional “open” operations to truly

“minimally invasive” operations naturally includes progression from operations involving multiple trocars and multiple incisions to operations involving access through the umbilicus alone. Laparoscopic operations through the umbilicus alone, laparoendoscopic single-site surgery (LESS), offer improved cosmesis and hope for less pain and improved recovery. [2]

Natural orifice transluminal endoscopic surgery (NOTES) has become an exciting area of surgical development. Significant limitations to this surgical concept, however, are lack of surgical expertise and appropriate flexible instrumentation. An alternative and competing technology to NOTES is NOTUS. [3]

Considering the acknowledged limitations of NOTES, single-port access (SPA) has emerged as a viable and more widely applicable minimally invasive technique. Unfortunately, access to a single port that allows for SPA has been limited to small numbers of academic centers.

LESS cholecystectomy is a safe and effective alternative to standard laparoscopic cholecystectomy. It can be undertaken without the expense of added operative time and provides patients with minimal, if any, apparent scarring. [4]

Laparoscopic appendicectomy, although not as widely performed as laparoscopic cholecystectomy, has got definite advantages over the conventional open procedure. [5]

Simultaneous laparoscopic operations were reported in the period from 1993 to 2003. The simultaneous performance of operations, as a rule, enhanced mildly the total duration at a basic stage, but did not influence the duration of the postoperative period and the patients’ rehabilitation essentially, as well as the frequency of intra- and postoperative complications. [4]

As with all new technology, patient selection is paramount during the initial period of one’s experience. [6]

The additional needle or a stitch to hold up organs is frequently used in natural orifice transluminal endoscopic surgery (NOTES) and was not considered an additional port. [7]

The use of a percutaneous loop to hold the appendix reduces

the operating time and replaces an additional port. It is safe and effective without any increased morbidity. [5]

In the literature, to our knowledge no paper was published before for combined laparoscopic cholecystectomy and appendicectomy by totally transumbilical approach.

Totally transumbilical cholecystectomy combined with appendectomy can be performed using standard laparoscopic instruments without any modification, added cost of SPA and other special instruments.

Additional ports are rarely required. It appears to be cosmetically superior to standard laparoscopic cholecystectomy alone or combined with appendectomy. It makes no new scars, but uses an existing scar (umbilicus), which is an embryological natural orifice. It may offer an acceptable alternative to NOTES, as it is the more logical next step for a laparoscopic surgeon. The safety and long-term results may be determined by more studies, and larger series are needed to show whether this can be recommended as a standard and reproducible procedure.

## **CONCLUSION**

Combined laparoscopic cholecystectomy and appendicectomy by totally transumbilical approach is feasible, safe and effective without any increased morbidity.

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