

Totally Trans-Umbilical Laparoscopic Appendectomy with "Dowais's technique"

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Abstract

Background: Acute appendicitis is one of the most common conditions requiring surgical intervention. Laparoscopic appendectomy (LA) is becoming a safe and effective operation for acute appendicitis recently. Several authors proposed various newer techniques of LA. We present our experience with totally trans-umbilical LA (TTULA). Objectives: To present an initial experience of a new approach (Dowais's technique) of LA. Methods: Twenty-four patients were randomly selected for TTULA from February to April 2009 at King Khalid Hospital Najran, Saudi Arabia. A percutaneous silk loop was used in addition to two trans-umbilical ports. Results: The procedure was completed successfully in all the patients. Mean operative time was 40 minutes. No significant post-operative complications were encountered. The hospital stay was 1.3 days. Conclusion: LA can be performed using TTULA with Dowais's technique, which is a safe, effective technique that allows nearly scarless abdominal surgery.

INTRODUCTION

Acute appendicitis is one of the most common conditions requiring surgical intervention and afflicts one in seven individuals. The disease may occur at any age, but predominantly presents in the second and third decades. Open appendectomy (OA) has been a safe, effective operation for acute appendicitis for more than a century.

Laparoscopic appendectomy was first performed by Semm in 1982 [1] who conducted the procedure on a normal appendix [1]. Pier and co-workers [2] published the first large series of laparoscopic appendectomies for acute appendicitis in 1990. They demonstrated that LA could be applied in most cases of appendicitis, with a high degree of success and operative speed and low complication rate compared to traditional open appendectomy. Since then, numerous retrospective and prospective randomized controlled trials have compared open with laparoscopic appendectomy.

Although some of the randomized trials concluded that LA is superior to OA, others did not find either method to be uniformly better [3].

Recently, there has been an evolution in endoscopic therapy - natural orifice transluminal endoscopic surgery (NOTES).

The major barriers that limit clinical application include access, closure, infection, suturing technology and orientation [4].

Natural orifice transluminal endoscopic surgery (NOTES) is the newest technique emerging in the field of surgery. There are several techniques described in the literature, though there is no standardization yet. [5].

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. [6]

Presented here are the steps necessary to perform totally transumbilical laparoscopic appendectomy (TTULA) with the use of Dowais's technique.

This technique opens another discussion of comparison between outcomes of OA, LA and TTULA. The aim of this preliminary study, which to the best of our knowledge is the first in the Middle East, is to help medical decision-makers to open a dialogue and decide which of the three approaches should be preferred in future.

PATIENTS AND METHODS

This prospective study included 24 patients, 18 male and 6 female, mean age 32 years (ranging from 12 to 65 years) during a 3-month period (Feb. – Apr. 2009).

Patients were assigned to laparoscopic appendectomy and totally transumbilical approach laparoscopic appendectomy (TTULA) was employed by a single surgeon in King Khalid Hospital - Najran - Saudi Arabia.

To perform TTULA with Dowais's technique we make two 10mm and 5mm incisions (supra-umbilical and infra-umbilical, respectively) until the fascia is identified. One 5-mm and one 10-mm trocar are placed (fig. 1) after a pneumoperitoneum up to 15 Torr has been obtained using the Veres needle. Intra-abdominal visualization should be obtained with a 5-mm 30°-angled lens laparoscope. The angled lens scope is necessary to minimize external interference of the instrument handles.

Figure 1

Fig. 1: 5-mm and 10-mm trocars are placed



Because only one other instrument is used, it is imperative to grasp the appendix. For this we pass a silk suture on a straight cutting needle into the abdomen at McBurney's point and it is brought out from another point nearby.

The appendix is held against the abdominal wall with the help of the silk suture loop (fig. 3). This enables the exposure of both the meso-appendix and the base of the appendix.

Figure 2

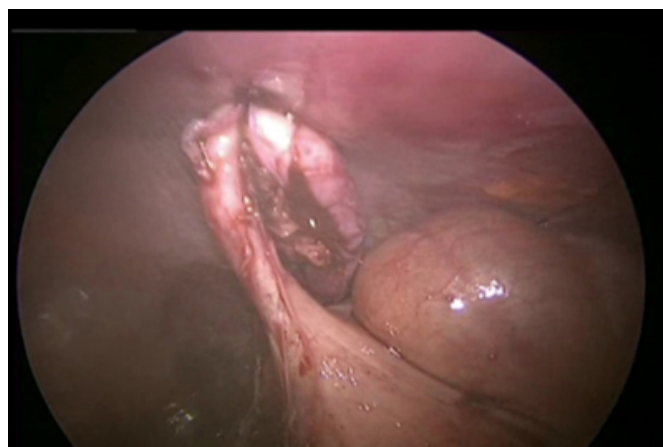
Fig. 2: Appendix within the loop



A straight laparoscopic instrument can then be used to perform the dissection just as in a standard laparoscopic appendectomy (fig. 3). Moreover, any adjustment of the appendix position can be accomplished by releasing the silk loop and reposition of the appendix (i.e. the silk suture loop is used in place of a grasper).

Figure 3

Fig. 3: Appendix after dissection



After complete dissection of the appendix, the silk suture loop is released and a pre-tied Vicryl loop is passed around the appendix base, its plastic sheath is removed and a grasper is passed to place the appendix again into the silk suture loop (fig. 4, 5) to hold it before tying the Vicryl loop by a knot pusher (fig. 6). This is repeated twice before dividing the appendix (fig. 7). The appendix is withdrawn into the trocar and extracted from the abdomen through the trocar (fig. 8).

Figure 4

Fig. 4: Placing the pre-tied Vicryl

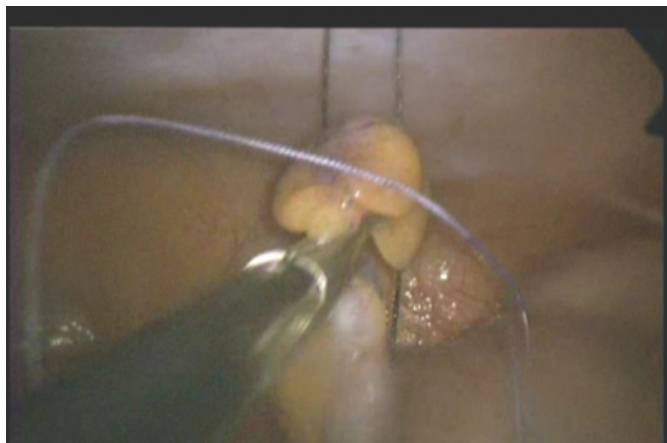


Figure 5

Fig. 5: Pre-tied Vicryl loop in place

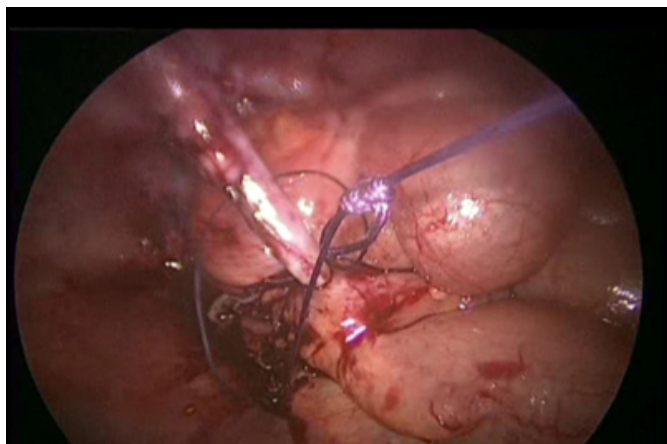


Figure 6

Fig. 6: Tying by knot pusher

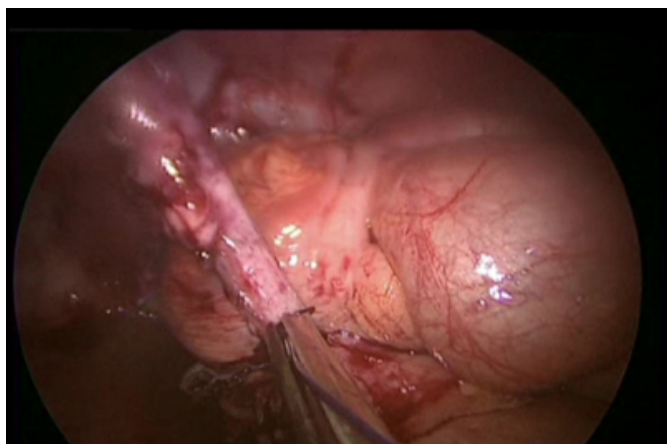


Figure 7

Fig. 7: Dividing the appendix

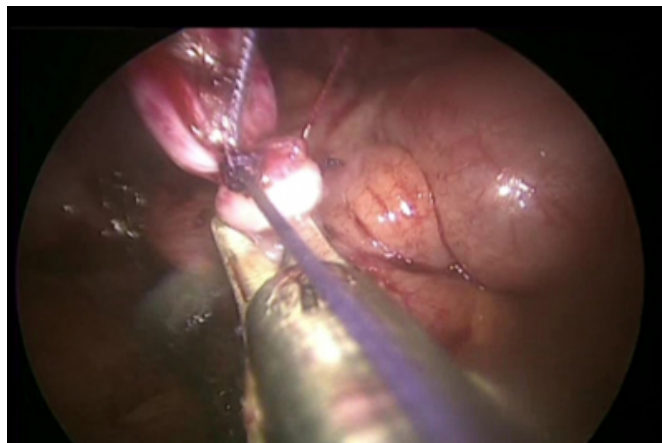


Figure 8

Fig. 8: Withdrawal of the appendix



RESULTS

A total of 24 patients were finally enrolled in the study. Patient age ranged from 12 to 65 years with an average age of 29. With regard to gender, 18 of the patients (75%) were men and 6 were women (25%).

Laboratory and physical values were obtained on the patient's admission to the emergency ward. However, these values did not change our strategy of doing TTULA. The mean operating time in our patients was 40 minutes.

Data on the histopathologic diagnosis of the removed appendix was available for all patients. A total of 21 appendices (87%) were inflamed (including suppurative, gangrenous and perforated appendix). We found a normal appendix in 16% of women undergoing appendectomy

compared to only 11% in men.

No significant post-operative complications were encountered.

All the patients were treated with prophylactic antibiotics. Zinacef and metronidazole were given about 30 minutes prior to surgery; 20% of patients were converted into a therapeutic dose for the treatment of the infectious process found during surgery.

Local anaesthetic (bupivacaine) was injected into the wound in all the patients. We evaluated the need of postoperative pain control medications. Seventeen percent of patients were treated with meperidine injections given intramuscularly. The patients received mostly diclofenac intramuscularly before discharge.

The average time to discharge was 1.3 days. All the patients were examined in the hospital's outpatient clinics after hospital discharge.

DISCUSSION

Recently, several authors have proposed that the advantages of using laparoscopy for the treatment of cholelithiasis could be extended to treat appendicitis. These authors believe that LA should be the preferred treatment for appendicitis because of the predicted similar morbidity and mortality, decreased hospital stay, earlier return to normal activity, and decreased negative appendectomy rate. Although predating laparoscopic cholecystectomy by 4 years, LA has not gained the same widespread popularity and enthusiasm, even though an increased number of surgeons are becoming comfortable with the LA technique and some authors have even suggested LA as the new "gold standard".

With advances in the field of minimally invasive surgery, there has been an evolution in endoscopic therapy - natural orifice trans-luminal endoscopic surgery (NOTES). Many endoscopic physicians are showing great interest in this new technique. However, few clinical reports have appeared to date. The major barriers that limit clinical application include access, closure, infection, suturing technology and orientation. [7]

Considering the acknowledged limitations of the 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.

Single port trans-umbilical appendectomy has been described in literature. Usually, a rigid laparoscope with a working channel was used in this technique. The appendix was pulled out from the umbilical port by the grasper inserted through the channel and removed extracorporeally. [8]

Trans-umbilical laparoscopic-assisted appendectomy (TULAA) is a safe and useful alternative for uncomplicated appendicitis. [9] In the literature, no paper, up to our knowledge, was published before for trans-umbilical laparoscopic appendectomy in Saudi Arabia.

Use of a percutaneous loop to hold the appendix reduces the need for other ports and the pre-tied loop can be used easily to ligate the appendix at its base. It is safe and effective without any increased morbidity. This technique discussed is the first of its kind that has been used successfully at our institution and can add to the procedures already published in the literature with the advantage of being cosmetically well accepted by all patients.

As with all new technology, patient selection is paramount during the initial period of one's experience. [10]

The additional needle or a stitch to hold up organs is frequently used in natural orifice trans-luminal endoscopic surgery (NOTES) and was not considered an additional port. [11]

We believe that trans-umbilical laparoscopic appendectomy will be driven by consumer demand, and therefore, laparoscopic surgeons will need to become proficient with trans-umbilical laparoscopic procedures.

CONCLUSIONS

Trans-umbilical surgery is a completely new technique with great challenge, which is more difficult than conventional laparoscopic surgery and needs to be further improved. Careful selection of patients is important at the beginning period of this technique.

Laparoscopic appendectomy can be performed using TTULA with Dowais's technique which is safe and effective without any increased morbidity and allows nearly scarless abdominal surgery.

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