

# Suprapubic approach for laparoscopic appendectomy

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## Abstract

**Objective:** To evaluate the results of laparoscopic appendectomy using two suprapubic port incisions placed below the pubic hair line. **Design:** Prospective hospital based descriptive study. **Settings:** Department of surgery of a tertiary care teaching hospital located in Rohtas district of Bihar. The study was carried out over a period of 11 months during November 2011 to September 2012. **Participants:** Seventy five patients with a diagnosis of acute appendicitis. **Materials and Methods:** All patients underwent laparoscopic appendectomy with three ports (one 10-mm umbilical for telescope and two 5 mm suprapubic as working ports) were included. Operative time, conversion, complications, hospital stay and cosmetic results were analyzed. **Results:** Total number of patients was 75 which included 46 (61.33%) females and 29 (38.67%) males with Mean age ( $\pm$ Standard deviation {SD}) at the time of the diagnosis was 30.32 ( $\pm$ 8.86) years. Mean operative time was 27.2 ( $\pm$ 5.85) min. One (1.33%) patient required conversion to open appendectomy. No one patient developed wound infection or any other complication. Mean hospital stay was 22.34 ( $\pm$ 12.18) h. Almost all patients satisfied with their cosmetic results. **Conclusion:** A laparoscopic approach using two supra pubic ports yields the better cosmetic results and also improves the surgeons working position during laparoscopic appendectomy. Although, this study had shown better cosmetic result and better working position of the surgeon, however it needs further comparative study and randomized controlled trial to confirm our findings.

**Key words:** Laparoscopic appendectomy, open appendectomy, supra pubic approach

## INTRODUCTION

Appendectomy is the most commonly performed intra-abdominal operation. Semm<sup>[1]</sup> first introduced laparoscopic method for appendectomy in the early 80s. Since then laparoscopic appendectomy was made popular by various surgeons and preferred over open method due its inherent advantages.<sup>[2]</sup> Different techniques have been described by different authors for LA in respect to port placement, handling the base of appendix, division of mesoappendix and removal of appendix.<sup>[3-10]</sup> We used the 10-mm umbilical port for telescope and for retrieval of appendix and two

5-mm as working port in supra pubic area below the pubic hair line. There are a lots of published study on result of different approach for laparoscopic appendectomy, in world literature, but there are very few published large Indian studies, analyzing the result of supra pubic approach for laparoscopic appendectomy, in Indian patients. In this study, we have described our experience with this technique of laparoscopic appendectomy.

## MATERIALS AND METHODS

This hospital based prospective study was carried out in the department of surgery at Narayan Medical College and Hospital, Jamuhar, Rohtas, Bihar, India, for a period of 11 months from November 2011 to September 2012. The institute ethical committee approved the study protocol. All the patients were explained about the procedure and the possible conversion into open technique. Written informed consent was taken from the every patient and parents in case of minor patients. All patients with a diagnosis acute appendicitis were enrolled

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on a pre structured performa. This performa includes data on present age, body mass index (BMI), area of residence, duration of illness, religion of the patient, socioeconomic status, history of recurrent pain abdomen and other associated symptoms. A thorough clinical examination was done and findings were noted.

All patients underwent laparoscopic appendectomy with three ports (one 10 mm umbilical for telescope and two 5 mm suprapubic as working ports) were included in this study [Figure 1]. The pneumoperitoneum was created with veress needle using carbon-di-oxide and the pressure was kept at 11 mmHg. The table was kept in Trendelenburg position with 15° left tilt. A 0° telescope was introduced through the umbilical port for the complete examination of the abdomen. Two 5-mm ports placed in supra pubic area below the pubic hair line as working port. The appendix is then identified and lifted by a non-traumatic grasper. The mesoappendix was coagulated with bipolar cautery and divided [Figure 2]. The base of the appendix was ligated at the ileo-cecal junction and divided [Figure 3]. The appendix was retrieved out in a plastic bag through umbilical port. The umbilical port site wound was closed with 1.0 Vicryl. The patients were started orally after 4 h of operation and solid food on the next day. Patients were called for a revisit after a week for follow-up. Operative time, conversion, complications, hospital stay and cosmetic results were analyzed.

#### Inclusion criteria

Patients with uncomplicated acute appendicitis.

#### Exclusion criteria

Patients of acute appendicitis with complications.

#### Statistical analysis

Mean Age, operative time, body mass index (BMI) and hospital stay of the patients expressed in mean  $\pm$  SD. Data were analyzed using open epi statistical software version 2.3.1. *P* value < 0.05 was considered statistically significant for any given measures.

## RESULTS

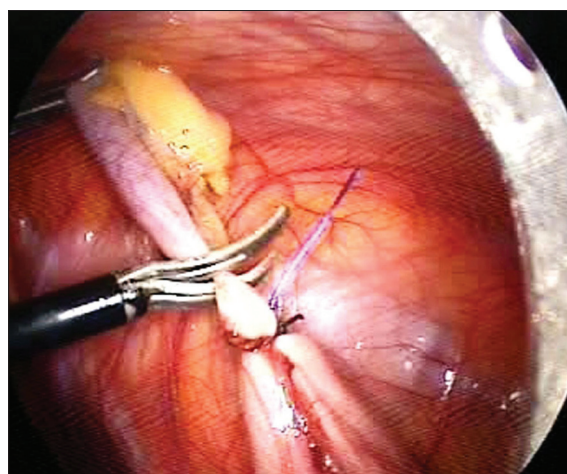
A total of 75 patients with uncomplicated acute appendicitis underwent suprapubic laparoscopic appendectomy, were included in this study. Of 75 patients, 46 (61.33%) were females and 29 (38.67%) were males with a female to male ratio 1.59:1. Fifty two (69.3%) patients belonged to rural area while 23 (30.7%) to urban area. Mean age ( $\pm$ Standard deviation {SD}) at the time of diagnosis was 30.32 ( $\pm$ 8.86) years ranging from 12-45 years and mean BMI of 19.3 ( $\pm$ 2.62) kg/m<sup>2</sup>, ranging from 16.18-24.15 kg/m<sup>2</sup>. One (1.33%) patient was converted to open procedure



**Figure 1:** Position of the different port in supra pubic approach for laparoscopic appendectomy



**Figure 2:** The mesoappendix was coagulated with bipolar cautery during supra pubic laparoscopic appendectomy



**Figure 3:** The base of the appendix was ligated at the ileo-cecal junction and divided

due to presence of adhesions of inflammatory origin. The mean operative time was 27.2 ( $\pm$ 5.85) minutes ranging from 20-45 min. No one patient developed wound

infection or any other complication. The mean ( $\pm$ SD) hospital stay was 22.34 ( $\pm$ 12.18) h ranging from 12-35 h. No patient developed post operative complication. Almost all patients satisfied with their cosmetic results.

## DISCUSSION

The popularity of LA has increased since its conception but it is still far from attaining the status of “Gold Standard”. The advantages of LA are quicker and less painful recovery, fewer complications, and superior cosmetic and better assessment of other intra-abdominal pathologies. Different techniques have been described to perform LA by different authors.<sup>[3-10]</sup> Either periumbilical or supra pubic port has been used for placement of telescope. The location for the working ports also varies from right upper quadrant to Mc Burney’s point, lower midline and left iliac fosse in standard surgical and laparoscopic texts.<sup>[11-13]</sup> We used the 10-mm umbilical port for telescope and retrieval of appendix and two 5-mm ports in supra pubic area below pubic hair line as working ports. This port placement provides better cosmetic result. The operative time for LA is reported to be longer than open appendectomy but it has been shown to decrease with increasing experience.<sup>[14]</sup> The reported average operative time varies considerably from 18 min<sup>[10]</sup> to 110 min.<sup>[15]</sup> Our mean operative time of 27.2 ( $\pm$ 5.85) min is comparable to many published studies. In contrast to our study, Kamal M, Qureshi KH from Multan Pakistan had reported mean operative time of 55 min.<sup>[16]</sup> In our study, conversion to open appendectomy was required in only one (1.33%) patients. Lower conversion rate in our study could be most likely due to study population (uncomplicated cases of acute appendicitis). Different authors have reported conversion rates varying from 0.55% to 21.5%.<sup>[17,18]</sup> Ng *et al.* from Hong Kong using the same technique have reported conversion in 8.7% of their 795 patients.<sup>[3]</sup> The main reasons for conversion reported in the literature are difficult anatomy and complicated appendicitis (perforation, gangrene and abscess).<sup>[19]</sup> In our study, one case required conversion to open appendectomy, also had adhesion of inflammatory origin. The mean hospital stay of 22.34 ( $\pm$ 12.18) h is comparable with published local and international studies.<sup>[14,20]</sup> In a Meta analysis Bennett *et al.* demonstrated a statistically significant reduction in hospital stay for LA as compared to open appendectomy.<sup>[2]</sup> Gilliam *et al.* have shown LA to be safe and effective even in day care setting for selected patients.<sup>[21]</sup> In this study, no one patient developed wound infection and this matches well with that published by other authors.<sup>[21,22]</sup> Wound infection has been reported to be lower with LA as compared to open appendectomy.<sup>[2,23]</sup> This is attributed to the technique of appendix removal, as removal in endobag or reducer sleeve avoids any contact between the inflamed appendix

and wound.<sup>[16,24,25]</sup> One of the reported disadvantages of LA is increased incidence of intra-abdominal abscess formation.<sup>[2]</sup> None of the patients in this study developed intra-abdominal abscess and this may be because of uncomplicated cases of appendicitis, limited number of patients and proper use of antimicrobials. A similar study reported that the placement of supra pubic trocars improves the surgeon’s working position during laparoscopic appendectomy and yields the best cosmetic results in the opinion of the majority of patients and healthy interviewees.<sup>[26]</sup> In our study, almost all the patients satisfied with cosmetics results.

## CONCLUSION

A laparoscopic approach using two supra pubic ports yields the better cosmetic results and also improves the surgeons working position during laparoscopic appendectomy. Although, this study had shown better cosmetic result and better working position of the surgeon, however it needs further comparative study and randomized controlled trial to confirm our findings.

### Limitations of the study

This is not a comparative study with other various techniques of laparoscopic appendectomy.

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