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Infraumbilical Midline Ports in Laparoscopic Appendicectomy: Does it provide Any Advantage to the Surgeon and the Patient?

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Abstract Original Research Article

AIM: To show modified port positions in laparoscopic appendicectomy which provides surgical advantages and better cosmesis. ***Materials and method***: Laparoscopic appendicectomy with these modified port positions was successfully performed in 378 cases over a nine years and eight months period from July 2009 to February 2019. First 12 mm port is placed on the lower margin of umbilicus. Next 5mm port is placed in the suprapubic midline below the pubic hairline. Third 5mm port is placed in the midline between the two previous ports. If the appendicectomy is expected to be an easy one, the third 5mm port is replaced by a 2.5mm alligator (instrument) port to hold and lift the appendix. Whenever necessary a 5mm telescope was used from any of the 5mm ports. ***Results and observation***: A total of 226 post appendicular lumps & recurrent appendicites with recurrent right lower abdominal pain and 152 acute appendicitis including 33 cases of appendicular perforation with generalized peritonitis were operated. Bowel walking was performed in all the recurrent appendicites cases. Ovarian cystectomies, drainage of fallopian tube abscess, excision of fimbrial cyst, extensive adhesiolysis and omental & lymph node biopsy were also performed in few cases along with the appendicectomy. All patients were very highly satisfied with their postoperative scar. ***Conclusion***: Laparoscopic approach using three infraumbilical midline ports gives a very good visualization, provides a very comfortable operating position for the surgeon & yields a better cosmetic scars. One can also deal with other pelvic pathology easily, without any extra port.

Key words: Laparoscopic Appendicectomy, Infraumbilical midline ports, unexpected pelvic pathology.

INTRODUCTION

The first successful laparoscopic appendicectomy was performed by Kurt Semm [1] in the year 1980. Since then over the years there have been many modifications in the technique and port positions [2,3].

In this paper we have described a modification of port positions which gives a very good cosmesis and provides an ergonomically favorable operating position to the surgeon, without causing any difficulty or visualization problem during the operation. This also has the advantage of managing any unexpectedly discovered simultaneous pelvic pathology without putting any extra ports. One can easily perform a bowel walking and a diagnostic laparoscopy through the same ports. In cases of perforated appendicites with generalized peritonitis cases, one can also easily reach and wash all the abdominal quadrants including the left sub diaphragmatic space under direct vision.

Fig-1: Darker infraumbilical mid line with the port positions

Fig-2: Comfortable operating position of the surgeon

MATERIALS AND METHOD

The authors have modified the port positions in laparoscopic appendicectomy to infraumbilical mid line area. Over a period of almost nine years and eight months, in a 420 bedded tertiary care hospital in this region, the authors have successfully performed 378 laparoscopic appendicectomies with this modified port placement.

Operative technique

The first 12mm trocar is introduced directly through a smiling semilunar infra umbilical incision along the lower margin of the umbilicus. We always go by direct trocar entry. A 5mm second trocar is inserted in the midline just below the pubic hairline but above the pubic bone through a vertical stab incision. This port is introduced under direct vision to avoid damage to the urinary bladder and to the pre peritoneal vessels, including the inferior epigastric vessel. Patients are not catheterized, but are asked to empty the bladder just before they are put on the OT table. Through these two ports, first an attempt is made to see the appendix. If the appendix is seen easily and no difficulty in dissection is expected, then a 2.5mm laparoscopic alligator grasper is introduced through a small vertical stab incision in between the previous two ports. This instrument is used to hold and lift up the appendix. In case difficulty is expected then a 5mm port is inserted in its place. The pressure is kept at 10-12mm Hg and table in Trendelenburg position with 15°-20° left tilt. A 10mm and a 5mm 0° telescope are used during the operation as per the necessity, although all of our cases we could finish the dissection and transaction of appendix using the 10mm scope. Mesoappendix with vessels are divided with ultrasonic scalpel. Base of the appendix is divided with Ultrasonic scalpel between two No.1-0 chromic catgut endoloops and the appendix is removed via the 10mm port under guidance of a 5mm laparoscope.

RESULTS

The authors have operated 226 recurrent appendicitis that includes patients with intermittent right lower abdominal pain & interval appendicectomies for previous appendicular lump earlier treated conservatively and 152 acute appendicitis cases including 33 cases of perforated appendicitis with generalized peritonitis. All the perforated cases were given peritoneal wash with plenty of normal saline, and pelvic tube drains were placed through the suprapubic port site under laparoscopic guidance. Out of all the cases 2 recurrent appendicites cases had post-op. fever and minimal right iliac fossa collections (recognized by USG). Both were managed conservatively. One had some serous discharge from the supra pubic port site for two weeks. Except one, who had developed pseudomembranous colitis and severe bleeding PR, none of the acute and perforated cases had any complications.

With the same ports the author has managed to do ovarian cystectomies in 10 cases, excision of fimbrial cyst in 2 cases and incision drainage of fallopian tube abscess in 3 cases. These cases of twisted and gangrenous fimbrial cysts, tubal abscesses and three twisted ovarian cyst were taken up for operation with a preoperative diagnosis of acute appendicites. Rest of the ovarian cysts was preoperatively diagnosed along with recurrent appendicites. Also extensive adhesiolysis were done in 6 cases (abdominal tuberculosis is very common in this part of the country) along with mesenteric lymph node biopsy and omental biopsy in three cases each.

Fig-3: Dissection of an ovarian cyst through the same ports (Also please check the font size)

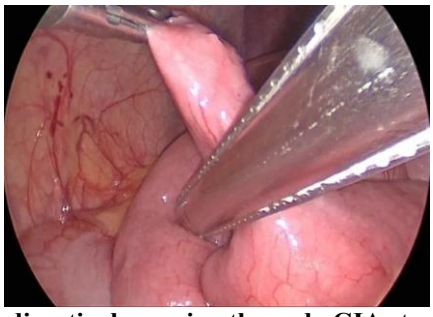

Fig-4: Resection of Meckel's diverticulum using the endo GIA stappler through the same ports

Bowel walking to see the small bowel was done in all the recurrent appendicites cases to rule out any other intestinal pathology like Meckel's diverticulum or TB strictures. In one case an inflamed Meckel's diverticulum was detected which was resected laparoscopically using endo GIA stappler.

DISCUSSION

Although the popularity of laparoscopic appendicectomy has increased, especially in female patients of child bearing age, it has not yet attained the status of "Gold Standard" in its treatment [4-7]. Advantages of doing an appendicectomy laparoscopically are almost similar operative time, less pain, early recovery & less hospital stay, superior cosmesis and most importantly assessment of other abdominal viscera and pathology [4, 6-10]. It is especially useful in obese patients and in women of child bearing age, in whom it may be considered as the procedure of choice over open appendicectomy [9, 11]. Also laparoscopic appendicectomy is an accurate method in diagnosing abdominal pathology other than acute appendicitis, thus avoiding the drawback of undiagnosed or misdiagnosed pathology mimicking acute appendicitis [12]. In acute perforated appendicitis with generalized peritonitis, one can easily and properly wash all the abdominal quadrants [13].

Standard laparoscopic appendicectomy is usually performed by three port technique [3, 14-16]. Occasionally a fourth port is required to assist in grasping or dissection of the appendix [14].

Many different port positions have been described for laparoscopic appendicectomy by different authors [5, 16-18]. A periumbilical or a suprapubic 12 mm port has been used for the telescope. Working port placement also varies from right upper quadrant to Mc Burney's point, suprapubic midline and or left iliac fossae in the standard textbooks [14-16].

In the standard technique the 12mm port is placed in the supraumbilical area and two 5mm ports are placed in the left and right lower quadrants. This configuration of ports has two drawbacks with respect to cosmesis and ergonomics [2-4]. First the cosmesis is not very ideal, especially if one needs to put two 12mm ports when 5mm telescopes are not available in the OT. Secondly the surgeon has to stand in an ergonomically unfavourable position with one arm crossed over the patient's body [3,4].

Another way of putting the ports is one paraumbilical 12mm port, one 5mm and another 12mm port below the pubic hairline in Rt. and Lt. Lower abdomen respectively [5]. With these port positions, Lap. Appendicectomy is ergonomically good but it is very difficult to manage any unprecedented pelvic problem, without putting extra ports. Also the scars are not better than the present study.

In our study, we used a 12mm infraumbilical port for telescope and retrieval of the appendix, one suprapubic 5mm port for ultrasonic scalpel and either a 2.5mm or a 5mm port in the midpoint between these two. This port placement provides a very good cosmetic result as well as optimal ergonomics.

Studies have reported that the suprapubic trocar insertion instead of a right iliac fossa port

improves the working positions for surgeons and yields better cosmesis [2]. With our port positions, the surgeon does not have to work with the left hand crossed over the patient's body. Instead one can operate very comfortably with both the working hands near each other. There is also no difficulty in visualization of the appendix even in difficult positions like retroperitoneal or paracaecal appendix. In such cases, if needed a 5mm telescope instead of a standard 10mm telescope can be used through any of the 5mm port for better visualization. Even in small children where the ports remain little nearer to each other, we could manage the operation quite comfortably without any sword fighting of the instruments.

We have found that all the patients in our study were highly satisfied with the cosmetic results. The infraumbilical semilunar incision, given for the camera port, when healed, merges with the umbilicus leaving hardly any visible scar. Since all the ports are placed in the infra umbilical midline which usually is a little darker than the rest of the abdominal wall, the scars become almost invisible later on. Hardly any visible scars remain after about 6months post operatively.

Fig-5: Shows the urinary bladder and the tip of the suprapubic trocar

Fig-6: Immediate postoperative and after three months. One cannot make out the operation scars.

We have also managed to operate a few pelvic pathologies unexpectedly discovered during the appendicectomy without putting any extra trocar, without any difficulty. However there are some important technical points while inserting the suprapubic trocar. It should be inserted under vision and careful transillumination to prevent injury to the urinary bladder and abdominal wall vessels [3]. Also the insertion of trocar into this area can be slightly difficult because of the loose attachment of suprapubic peritoneum to the abdominal wall, which results in tenting of the peritoneum before the trocar can penetrate it [3].

CONCLUSION

In our experience, using three infraumbilical midline ports is a safe and feasible approach for laparoscopic appendicectomy. It yields a better cosmetic scars and also improves the ergonomics with better operating position for the surgeons. But it needs further evaluation by comparative studies and randomized trials to confirm our findings.

LIMITATION OF THE STUDY

Our study is not a comparative study between different port position techniques of laparoscopic appendicectomy. Therefore all our findings are subjective rather than objective in nature.

Another limitation of our study is availability of 5mm telescope, which may not be available in all centres.

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