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LAPAROSCOPIC VERSUS OPEN APPENDECTOMY COMPARATIVE STUDY

General Surgery

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ABSTRACT

Introduction: Appendectomy is one of the most commonly performed surgical procedure in the dept of general surgery . Appendectomy is performed by both open and laparoscopic methods. Still there is lack of consensus, which method is best. In this comparative study, we aimed to compare the laparoscopic and open technique in the treatment of acute appendicitis.

Methods: Data collected from 100 consecutive patients with acute appendicitis were studied comparatively. These comprises 60 patients who underwent open appendectomy and 40 patients treated laparoscopically. The two groups were compared for operative time, length of hospital stay, postoperative pain, complication rate and return to normal activity.

Results: Laparoscopic appendectomy was associated with a shorter hospital stay, less need for analgesia and with a faster return to normal activities. Operative time was significantly shorter in open group in comparison to laparoscopic procedure. Total number of complications were less in the laparoscopic group with a significantly lower incidence of surgical site infection.

Conclusion: The laparoscopic approach is a safe and efficient operative procedure in appendectomy and it provides clinically beneficial advantages over open method (including shorter hospital stay, decreased need for postoperative analgesia, early return to work, early food tolerance and lower rate of surgical site infection) against only marginally higher hospital costs and operative time.

KEYWORDS

Open appendectomy, Laparoscopic appendectomy, Acute appendicitis.

INTRODUCTION

Acute appendicitis is a common surgical emergency requiring rapid intervention, with a lifetime risk of 6%-7%.[1]Maximum incidence of acute appendicitis is in the second and third decades of life but affects all age groups.[2]In 1983, Semm[3] introduced the new laparoscopic technique which replaced the open procedure as the standard practice for a number of surgical procedures. In certain teaching hospitals, every patient with right iliac fossa pain has to go through laparoscopy before continuing to appendectomy.[4,5] Laparoscopic appendectomy is not as prevalent as laparoscopic cholecystectomy. Open appendectomy has been the gold standard for treating patients with acute appendicitis for more than a century, but the efficiency and superiority of laparoscopic approach compared to the open technique is the subject of much debate nowadays.[6,7]

With the increased interest and fascination with this laparoscopic technique, researchers have been studying the outcomes of both the laparoscopic and open appendectomies in order to establish a comparison between the two techniques. The main aim of this study was to investigate the differences between open and laparoscopic appendectomy in the management of acute appendicitis.

METHODS

This study was conducted at Rajendra institute of Medical Sciences, Ranchi. Data for all patients who underwent open or laparoscopic appendectomies between May 2010 and June 2011 were retrieved from the database. A total of 100 patients underwent appendectomies of which 40 were laparoscopic procedures, and remaining 60 were open procedures. The decision of the method of appendectomy was entirely controlled by the operating surgeon's preference.

There are no important demographic differences between the two groups related to age , sex, and WBCs count. Pregnant women and patients with severe medical disease (hemodynamic instability, chronic medical or psychiatric illness, cirrhosis, coagulation disorders) requiring intensive care were excluded. The six parameters measured in this study were 1) operative time 2) hospital stay, 3) postoperative complications,4)analgesia use, 5) start of fluid diet, and 6) return to normal activity. The data were collected from patient's progress sheets. The length of operation was obtained from the operative notes. The days spent in the hospital postoperatively were calculated from the date of surgery until the date of discharge. All the patients included in the study were put on a regular dose of similar analgesia postoperatively.

The diagnosis was made clinically with history (right iliac fossa or periumblical pain, nausea/vomiting), physical examination(tenderness or guarding in right iliac fossa). In patients where a clinical diagnosis could not be established, imaging studies such as abdominal ultrasound or CT were performed. Both groups of patients were given a prophylactic dose of third generation cephalosporin and metronidazole at induction of the general anaesthesia as a part of protocol.

Open appendectomy was performed through standard McBurney incision. After the incision, peritoneum was accessed and opened to deliver the appendix, which was removed in the usual manner. A standard 3-port technique was used for laparoscopic group. Pneumoperitoneum was produced by a continuous pressure of 12–14 mmHg of carbon dioxide via aVerres canula, positioned in infraumbilical site. The patient was placed in a Trendelenburg position, with a slight rotation to the left. The abdominal cavity was inspected in order to exclude other intraabdominal or pelvic pathology. After the mesoappendix was divided with bipolar forceps, the base of the appendix was secured using endoloop. The specimen was retrieved and sent for histopathology. The patients were not given oral feed until they were fully recovered from anesthesia and had their bowel sounds returned when clear fluids were started. Soft diet was introduced when the patients tolerated the liquid diet and had passed flatus. Patients were discharged once they were able to take regular diet, afebrile, and had good pain control. The operative time (minutes) for both the procedures was counted from the skin incision to the last skin stitch applied. The length of hospital stay was determined as the number of nights spent at the hospital postoperatively. Wound infection was defined as redness or purulent or seropurulent discharge from the incision site. Seroma was defined as localized swelling without redness with ooze of clear fluid. Paralytic ileus was defined as failure of bowel sounds to return within 12 h postoperatively

RESULTS

Variables assessed were operating time, hospital stay, post operative complications, analgesia use, start of fluid diet and return of normal activity.

Table 1: Comparison of the group's variables

Feature	Open appendectomy	Laparoscopic appendectomy
1.Operative time	30 minutes	55 minutes
2.Hospital stay	2 days	1 day
3.postoperative complications	6%	3%

4.Analgesia use	36 hours	12 hours
5.Start of fluid diet	14 hours	14 hours
6.Return to normal activity	14 days	10 days

Concerning open appendectomy, the mean operative time was 30 minutes with 2 days of hospitalization, post operative complications seen in 6% of patients mainly in the form of surgical site infections. Return to oral diet was the same in both groups with no statistical difference. Return to work was 14 days for open appendectomy and 10 days in case of laparoscopic appendectomy. Post operative parenteral analgesia needed for 12 hours in laparoscopic appendectomy and 36 hours in open appendectomy.

DISCUSSION

Acute appendicitis is the most common intra-abdominal condition requiring emergency surgery [8]. The possibility of appendicitis must be considered in any patient presenting with an acute abdomen, and a certain preoperative diagnosis is still a challenge [9,10]. Although more than 20 years have elapsed since the introduction of laparoscopic appendectomy (performed in 1983 by Semm, a gynaecologist), open appendectomy is still the conventional technique.

Laparoscopy participates in evaluating acute abdomen. And had a major role in young females when it is difficult to distinguish between acute appendicitis and gynecological clinical conditions like "Pelvic Inflammatory disease", "Twisted ovary" and ectopic pregnancy etc.[11-13]

Laparoscopic procedures had rarer postoperative respiratory complications compared to open surgery.[14,15] Advantages of laparoscopic appendectomy are its better visualisation of organs, shorter hospital stay, fewer wound infection, less post-operative pain and rapid coming back to work. The results of the study show that laparoscopic appendectomy gives rise to significantly less post-operative pain, shorter hospital stay and quick recovery.[16]

Mean operation time was longer in laparoscopic appendectomy (55 minutes) compared to open (30 minutes). We observed that the delay was not during operation rather than before starting the real operation in positioning the patient, application of different tubes, cables and video apparatus around the patient.

It was difficult to calculate post-operative pain. So, we indirectly measure it by calculating how many days took to mobilize freely and how long the patient used analgesics. On average after 12 hours the patients were fully mobilized and did not need any analgesics where as in open appendectomy group this average time was 36 hours. This finding is common in almost all the studies done up to date.[17-19]

Post operative complications mainly surgical site infection was almost insignificant in laparoscopic appendectomy as compare to open appendectomy, as the appendix was pulled into the trocar before removing. This action minimizes the risks of wound infection to the skin.

CONCLUSIONS

Our results showed the advantages of the laparoscopic approach over open appendectomy including shorter hospital stay, decreased need for postoperative analgesia, early food tolerance, earlier return to work and lower rate of wound infection. Provided that surgical experience and equipment are available, laparoscopy could be considered safe and equally efficient compared to open technique and should be undertaken as the initial procedure of choice for most case of suspected appendicitis. The surgeons in this study had a stronger preference for the laparoscopic technique due to its multiple advantages. They believe that laparoscopy serves as a diagnostic tool in addition to its therapeutic use. They also believe that laparoscopy appendectomy has the advantage of identifying the position of the appendix with greater precision due to the better visualization of the abdominal contents.

However, since there is no consensus to the best approach, both procedures (open and laparoscopic appendectomy) are still being practiced actively deferring the choice to the preference of surgeon and patients. In the future, laparoscopic appendectomy could represent the standard treatment for patients with appendicitis and undiagnosed abdominal pain.

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