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ORIGINAL ARTICLE

Laparoscopic Appendectomy VS Open Appendectomy at Jeddah National Hospital Saudi Arabia; A Comparative Study

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ABSTRACT

Objective: To compare the laparoscopic appendectomy (LA) with open appendectomy (OA) in terms of operative time, complications, and hospital stay.

Patients and Methods: This comparative study was done at Jeddah National Hospital, KSA. All the patients aged more than 12 years, both genders, and those who were admitted with appendicitis to the surgical department and underwent surgical treatment were included. The study duration was one year, from November 2019 to October 2020. All the patients were divided into two groups. Patients who underwent laparoscopic appendectomies were put in LA group, while those who underwent open appendectomies were kept in OA group. All the patients were observed during hospital stays and comparative treatment outcomes were observed in terms of the pain, number of hours required for the return of bowel function, operative time, infection and hospital stays. A study proforma was used for the data collection and SPSS version 26 was used for the data analysis.

Results: A total of 100 cases were comparatively studied, and the overall age of the patients was 33.34+7.23 years. Males were dominant as compared to females. Average operating time was lower in LA group as 37.11+8.41 minutes, compared to the OA group 47.45+4.34 minutes (p-0.001). The average post-operative hospital stay was 1.88+0.62 days in LA group, compared to the OA group 2.14+0.90 days, without a significant difference (p-0.098). Post operative infection was statistically insignificant in both groups as one case in the LA group and in cases of the OA group (p-558). Conversion to an open procedure was required in one case with extensive cecal adhesions and retrocecal gangrenous appendicitis with local peritonitis. 70% patients of LA group, returned to their normal routine life within 10 days and the remaining started doing their normal activities within 15 days, while in the OA group, 60% of patients returned to normal activity and 40% returned to work after 20 days. No mortality was found in either group.

Conclusion: Laparoscopic appendectomy was observed to be a time-saving procedure, which depends on skills, patient selection, and availability of the laparoscope. It is safe when compared to open appendectomy. It shortens the hospital stay, allows for an earlier return to oral feeding, normal routine work, and results in fewer post-operative complications.

Keywords: Laparoscopic, Open, Appendectomy, Hospital stay, pain, infection

INTRODUCTION

One of the most prevalent causes of severe abdominal pain is acute appendicitis.[1] The diagnosis of acute appendicitis remains difficult, and there are still significant disagreements on how to treat it in various settings and practice patterns throughout the world.[1] The most common age for appendicitis is between 5 and 45 years, with an average age of 28 years.[2] The rate of occurrence is about 233 per 100,000 persons. Males are somewhat more likely than females to develop acute appendicitis, involving lifetime incidences of 8.6% and 6.7 percent for males and females, respectively.[2] In the United States, around 300,000 hospital visits for appendicitis-related disorders are made each year.[2,3] Clinical-based diagnosis of AA can be difficult, requiring a combination of clinical, laboratory, and radiographic evidence. Clinical evaluations that include findings from the physical examination and inflammatory markers might enhance the diagnostic workup. It is the most commonly performed procedure in emergency surgery.[4] Appendectomy has still been performed using both open (OA) and laparoscopic (LA) techniques due to a lack of agreement on the best approach.[4] For more than a century, the procedure of an open appendectomy has become the standard method for treating individuals having acute appendicitis, but the effectiveness and supremacy of the laparoscopic method compared to the open procedure remains a point of contention currently.[4-6] Laparoscopic surgery provides various advantages according to the literature, including a faster recovery, decreased pain at the surgical site, and a shortened hospital stay.[7,8] Laparoscopic appendectomy provides considerable advantages in complicated appendicitis, such as a lower risk of wound infection and complete visibility of the peritoneal cavity. Although laparoscopic cholecystectomy is the gold standard and has long since superseded the open approach, the laparoscopic technique has yet to acquire the same level of acceptance.[7,9] The successful implementation and applicability of the laparoscopic technique in the perforated appendix, is still debated, as it is linked to a higher rate of the collection intra-abdomen.[10] However, several other studies have observed that the laparoscopic technique is linked to fewer postoperative complications.[10,11] According to some researchers, laparoscopic appendicectomy is a potential procedure since it is less invasive, resulting in shorter hospitalizations, less pain, a lower rate of infection, and a lower risk of adhesions postoperatively, while according to certain writers, it has a longer operative duration and a higher cost. This study has been done to compare the laparoscopic appendectomy with the open appendectomy in terms of operative time, complications, and hospital stay.

MATERIAL AND METHODS

This comparative study was done at a 150 bedded hospital having facilities to provide all the specialties, situated at the center of the big city of Jeddah in King Saudi Arabia. All the patients aged more than 12 years, both genders, and those who were admitted with appendicitis to the surgical department and underwent surgical treatment were included. Patients having appendicular mass, peritonitis, perforated appendix, abscess formation, history previous lower abdominal surgery and associated large ventral hernia, liver cirrhosis and ascites, coagulopathy abnormalities, converted procedures, paediatric patients and pregnant women were excluded. The diagnosis of appendicitis was made in the emergency department, based on a detailed history, clinical examination, and base line laboratory investigations like CBC. Sonography was done as a routine and CT scans were done whenever necessary. After completing pre-operative follow-ups, all the patients were divided into two groups as per surgical treatment. Patients who underwent laparoscopic appendectomies were put in the LA group, while those who underwent open appendectomies were kept in the OA group. In the LA group, pneumoperitoneum

was done by Verres needle with a pressure of 12-14 mmHg of carbon dioxide. With 10 mm trocar at umbilical region and two 5 mm trocar at left iliac fossae and suprapubic region. The patient was placed in a Trendelenburg position, with a slight rotation to the left. The abdominal cavity was thoroughly inspected Maryland forcep was used for the dissection of the appendix. The mesoappendix was either ligated by intracorporeal knotting or ligasure diathermy or harmonic scalpel and the appendix was removed, leaving the appendix just attached to the cecum base by extracorporeal knotting at the base of the appendix by pushing a knot pusher across the port at the right-hand side with two successive links of Vicryl /0. The specimen was placed in an endobag and was removed through the suprapubic trocar. All specimens were sent for histopathology reports. In the OA group, appendectomy was typically performed through a 2-3 cm at McBurney point (medial two thirds and lateral one third of the line joining the anterior superior iliac spine to the umbilicus), muscle splitting incision in the right lower quadrant. After appendectomy, the stump was ligated with an absorbable suture. In complicated appendicitis, the abdomen was washed with warm saline and the skin incision was closed loosely. The patients were discharged on certain criteria like being afebrile, with audible bowel sounds, and being able to tolerate a liquid diet and dry wounds. Comparative treatment outcomes were observed in terms of the pain, number of hours required for the return of bowel function, operative time, infection and hospital stays. Pain assessment was done by visual anlage score (VAS). A study proforma was used for the data collection and SPSS version 26 was used for the data analysis.

RESULTS

A total of 100 cases were comparatively studied, and the overall age of the patients was 33.34+7.23 years. The majority were multinational patients, including Pakistan, India, Nepal, Bangladesh, and Sri Lanka, and the remaining were Arab population including Yemen and Egypt. Palestine, Sudan, Ethiopia, and the least number of patients were Saudis. Males were in the majority as compared to females as shown in table.1.

Average operating time was lower in the LA group 37.11+8.41 minutes, compared to the OA group 47.45+4.34 minutes (p-0.001). The average post operative hospital stay was 1.88+0.62 days in the LA group, compared to the OA group 2.14+0.90 days, without a significant difference (p-0.098). Table.2 Those patients who underwent LA group were discharged the next day in stable condition, except for 3 patients due to certain reasons like nausea, vomiting, and pain, while 01 patient had to stay due to wound infection. There was less narcotic use in both groups. Post operative infection was statistically insignificant in both groups (one case in the LA group and two cases in the OA group) (p-558). Conversion to an open procedure was required in one case with extensive cecal adhesions and retrocecal gangrenous appendicitis with local peritonitis. In the LA group, all the patients were mobilized within 06 hours, and 6-8 hours in the OA group, because of vomiting, pain, and less motivation. The readmission rate was zero, and only 1 case in the OA group had wound infection, and 01 case was converted to open. At the time of discharge, all patients were highly satisfied. The follow-up was scheduled for the 8th day postoperatively, and there was no urgent postoperative visit other than the scheduled follow-up. In the LA group, 70% of patients returned to their normal routine life within 10 days and the remaining started doing their normal activities within 15 days, while in the OA group, 60% of patients returned to normal activity and 40% returned to their work after 20 days. No mortality was found in both groups.

Table 1: descriptive statistics of age and gender n=100

Variables		Statistics
Age (years)		33.34+7.23 years
Hospital stays	Males	69(69.0%)
	Females	31(31.0%)

Table 2: Outcomes comparison in both groups n=100

Variables		LA group	OA group	p-value
Operative time (minutes)		37.11+8.41	47.45+4.34	0.001
Post-operative pain (VAS)		1.88+0.62	2.14+0.90	0.098
Hospital stays		01.0.4+0.19	02.04+0.19	0.001
Post-operative Infection	Yes	1(2.0%)	2(4.0%)	0.558
	No	49(98.0%)	48(96.0%)	

DISCUSSION

Advantages of a laparoscopic appendectomy are that it combines the advantages of diagnostic and management in a single surgery with the least amount of morbidity. Additionally, the whole abdomen can be seen to rule out any associated pathology. In this study a total of 100 cases comparatively studied and overall age of the patients was 33.34+7.23 years, males were dominant as compared to females. These findings were almost similar to the study of Biondi A et al[6] as the average age of the patients of LA group was 29.66 ± 15.13 years and group OA average age was 27.75 ± 14.24 years and males were in majority. Consistently Shaikh MR et al[7] found similar findings regarding gender and inconsistently they found lower average age compared to this study and this age dissimilarities may due to difference in studies sample sizes and selection criteria.

In this study average operating time was significantly lower in the LA group 37.11+8.41 minutes, compared to the OA group 47.45+4.34 minutes (p-0.001). Consistently Shaikh MR et al14 also reported that, in the laparoscopic group, the operation took average time 40±8 minutes, whereas in the open appendectomy group, it took average operating time 25±7 minutes. On other hand inconsistently Ibraheem M et al[12] reported that, in terms of operative time, open appendectomy has a statistically significant lower average 34.50±11.48 minutes than laparoscopic appendectomy 56.42±8.69 minutes. Although Nazir A et al[10] demonstrated that the laparoscopic appendectomy took lower average operating time 46.98±2.99 minutes compared to open appendectomy 53.02 ± 2.88 minutes. The prolonged operating time in laparoscopic appendectomy was attributable to the complications associated with the procedure and was primarily based on the surgeon's ability and experience.

In this study the average post operative hospital stay was 1.88+0.62 days in LA group, compared to the OA group 2.14+0.90 days, without significant difference (p-0.098). Those patients who underwent LA group were found ok for next day discharge, except for 03 patients due to certain reasons like nausea, vomiting, and pain while 01 patient had to stay due to wound infection. Post operative infection was statistically insignificant in both groups as one cases of group and in cases of the OA group (p-558). Conversion to an open procedure was required in 01case with extensive cecal adhesions and retrocecal gangrenous appendicitis with local peritonitis, in LA group, all the patients were mobilized within 06 hours and 6-8 hours in OA group, because of vomiting, pain, and less motivation. In this study the follow-up was scheduled on 8th day postoperatively and there was no urgent postoperative visit other than the scheduled follow-up. In LA group 70% patients returned to their normal routine life within 10 days and remaining started doing their normal activities within 15 days, while OA group, 60% patients returned to normal activity and 40% returned to their work after 20 days. No any mortality was found in both groups. Above findings of this study were almost similar to the studies of Nazir A et al[10] and Mohamed AA et al[14]. In the line of this study Mohamed AA et al[15] reported that there were 106 patients who had an OA and 110 individuals who had a LA. In LA, the average operative time was 42.8±210.84 minutes, while in OA it was 37.99±9.81 minutes (p0.86). In 2.8 percent of laparoscopic instances, conversion was performed. When comparing postoperative pain, LA VAS score lower than OA (P0.05). average postoperative hospital stay was lower in LA group than OA group (p-0.01) and surgical site infection were documented in 9 cases in the OA group and in 3 cases of the LA group.[15] On other hand Seqsaqa M et al[16] also found comparable findings as LA

group resulted in a considerably shorter hospital stay 4.23 days compared to OA group, 5.13 days (p -0.044), I n terms of surgical site infection, postoperative ileus, readmissions and collection intraperitoneal, there were no significant differences between the two groups.[17] Postoperative problems may rise according on the participant's characteristics, and for high-risk individuals, timely prevention of emergent general anaesthetic may be useful and for a successful LA, the surgeon's competence and the hospital's collaboration are critical.[17] Although under the hands or instructions of skilled surgeons, the LA is safe and offers a number of advantages.[4,17,18]

CONCLUSION

Laparoscopic appendectomy was observed to be a time-saving procedure, which depends on skills, patient selection, and availability of the laparoscope. It is safe when compared to open appendectomy. It shortens the hospital stay, allows for an earlier return to oral feeding, normal routine work, and results in fewer post-operative complications.

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