

## Length of Stay and Patient Satisfaction after Appendectomy

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### ABSTRACT

**Objective:** This review to show the degree of patient satisfaction and length of stay after laparoscopic appendectomy or open appendectomy. Moreover, the degree of appendicitis was considered either acute appendicitis or perforated appendicitis which can result in complications like sepsis, peritonitis and gangrene. **Data sources:** (PubMed, Google Scholar) have been searched for papers that addressed patient satisfaction and length of stay after appendectomy, preoperative appendicitis status and the operation used for appendectomy were considered during searching. **Results:** It was obvious that patient who have undergone laparoscopic appendectomy were more satisfied and had short length of stay after the operation neither than patients who have undergone open appendectomy who were less satisfied and had longer length of stay. Also, it was clear that patient with acute appendicitis were more satisfied with short length of stay neither than patients with perforated appendicitis who were less satisfied with longer length of stay. **Keywords:** appendectomy, satisfaction, acute appendicitis, perforated appendicitis.

### INTRODUCTION

Appendicitis is inflammation of the appendix. It may be acute or chronic. It's more common in males than in females. Appendicitis is the most common reason for abdominal surgery in children. About four of every 1,000 children under the age of 14 will undergo surgery called an appendectomy to remove their appendix. Appendicitis rarely occurs in children under the age of two, and mostly occurs in people between the ages of 15 and 30.

#### symptoms of appendicitis.

- Nausea
- Vomiting
- Pain when touched on the lower right side of the abdomen
- Abdominal pain or tenderness, usually in the center of the abdomen above the belly button, then shifting to the lower right side of the abdomen. The pain increases when moving, taking deep breaths, coughing, or sneezing.
- Fever, usually low-grade (under 100 degrees)
- Inability to pass gas
- Diarrhea
- Constipation
- Abdominal swelling
- Lack of appetite

If symptoms of appendicitis appear, it is important that the patient does not take laxatives or enemas to relieve constipation. These medications could cause the appendix to burst. Patient should also avoid taking pain medications that could mask the symptoms. The doctor would need to know the diagnosis of the condition.

Although the symptoms of appendicitis are the same for adolescents as they are for adults, they may begin differently. In adolescents, appendicitis can begin as a vague stomachache near the navel. This pain may progress to the lower right side of the abdomen.

The study was done after approval of ethical board of Jazan university.

#### Causes of appendicitis

In many cases, the cause for appendicitis is unknown. There can also be multiple causes for one case of appendicitis<sup>1</sup>.

Doctors believe an obstruction in the appendix may cause appendicitis. Obstruction may be either partial or complete. Complete obstruction is a cause for emergency surgery.

Obstruction is often due to an accumulation of fecal matter. It can also be the result of:

- enlarged lymphoid follicles
- worms
- trauma
- tumors

#### Types of appendicitis

1-Acute appendicitis:

IT is an inflammation of the appendix and is one of the most frequent causes of acute abdominal pain. It is often treated surgically as an emergency. As we still do not know the real reason behind the occurrence of acute appendicitis, it needs to be treated cautiously. Some may get it because of an obstruction of food or fecal matter; others may get it due to an infection<sup>2</sup>. Under certain conditions, the bacteria may multiply within the appendix. The appendix may swell, and become filled with pus, and

eventually rupture. Whatever the reason, immediate medical aid is required as this is a life threatening situation. Although the cause of appendicitis is not completely explored, it has been established that after surgical removal of the appendix, a person can live a healthy and normal life<sup>3</sup>. But, when the appendix bursts inside the body, all the infection contained within it gets released into the abdominal area. The consequences of this are very serious, and you need to be treated with antibiotics immediately. Appendicitis is the most common acute surgical procedure carried out on the abdomen.

#### 2-Chronic Appendicitis:

Although acute appendicitis is more common and develops quickly, chronic appendicitis is more rare and much slower. Therefore, when it comes to chronic appendicitis, timely recognition of the condition and treatment becomes a difficult job.

Some people with chronic appendicitis may only feel fatigue and mild pain in their stomach. It is natural to confuse this condition with a common stomach flu or virus. If discovered in time, it can be treated with powerful antibiotics, saving the patient is the need to undergo surgery. Just because it takes longer to recognize the symptoms, does not mean chronic appendicitis should be taken lightly. Fever, intense pain and nausea are generally not the symptoms of chronic appendicitis; therefore there is a big chance that it might go unnoticed. Due to the slow progress of chronic appendicitis, you will find that infection may spread all over the abdominal area. The symptoms often vary from patient to patient; therefore, only a doctor can diagnose it correctly. Many say a healthy diet will reduce the chances of chronic appendicitis, but this is not always the case. Just because you tend to live a healthy life and include lots of vegetables and fruit in your diet, does not mean the chances of getting chronic appendicitis are completely eliminated.

The only real difference between acute and chronic appendicitis is that chronic appendicitis takes longer to develop but is just as lethal.

#### 3-Perforated appendicitis.

When there's an obstruction in your appendix, bacteria can multiply inside the organ. This leads to the formation of pus. The increased pressure can be painful. It can also compress local blood vessels. A lack of blood flow to the appendix may cause gangrene.

If the appendix ruptures, fecal matter can fill the abdomen. This is a medical emergency<sup>4</sup>.

Peritonitis is another possible consequence of a ruptured appendix. It's an inflammation of the tissue that lines the abdominal wall. Other organs can also become inflamed after a rupture. Affected organs may include the cecum, bladder, and sigmoid colon.

If the infected appendix leaks instead of ruptures, it can form an abscess. This confines the infection to a small walled off area. However, an abscess can still be dangerous.

#### Treatment:

##### 1-laparoscopic appendectomy

The appendix is removed by laparoscope through an incision in the right lower abdominal wall.

In most laparoscopic appendectomies, surgeons operate through 3 small incisions (each ¼ to ½ inch) while watching an enlarged image of the patient's internal organs on a television monitor<sup>5</sup>. In some cases, one of the small openings may be lengthened to complete the procedure.

##### Advantages of laparoscopic appendectomy

Results may vary depending upon the type of procedure and patient's overall condition<sup>6</sup>. Common advantages are.

- Less postoperative pain
- May shorten hospital stay
- May result in a quicker return to bowel function
- Quicker return to normal activity
- Better cosmetic results
- Patient satisfaction is high

Although laparoscopic appendectomy has many benefits, it may not be appropriate for some patients<sup>7</sup>. Early, non-ruptured appendicitis usually can be removed laparoscopically. Laparoscopic appendectomy is more difficult to perform if there is advanced infection or the appendix has ruptured. A traditional, open procedure using a larger incision may be required to safely remove the infected appendix in these patients.

##### 2-Open appendectomy

Open appendectomy involves making a 2-4 inch deep incision on the right side of the lower abdomen. The appendix is separated from the surrounding abdominal organs, cut and then removed. The stump (small part of the appendix that remains after the cut) is either inverted or cauterized<sup>8</sup>. The abdominal wall is then closed and the skin sutured.

According to Sauerland *et al.* in case the appendix has already ruptured; further management varies depending upon the severity of infection and inflammation, whether there is

an abscess (pus formation) or a phlegmon (inflammatory mass)

In that situation, the surgeon decides upon the treatment based on various other factors <sup>9</sup>

An open appendectomy surgery is performed:

\* in case there is an infection/inflammation of the appendix, called an appendicitis

\* the person suffers from severe pain (initially around the umbilicus and then radiating to the lower aspect of the right side abdomen) accompanied by a host of other symptoms

\*these could include nausea, vomiting, loss of appetite, fever, and chills.

Risks and Complications after open appendectomy surgical procedure.

\*Abscess formation in the abdominal cavity

\*In case of pregnant women, there is a 5% chance of losing the fetus

\*Pneumonia

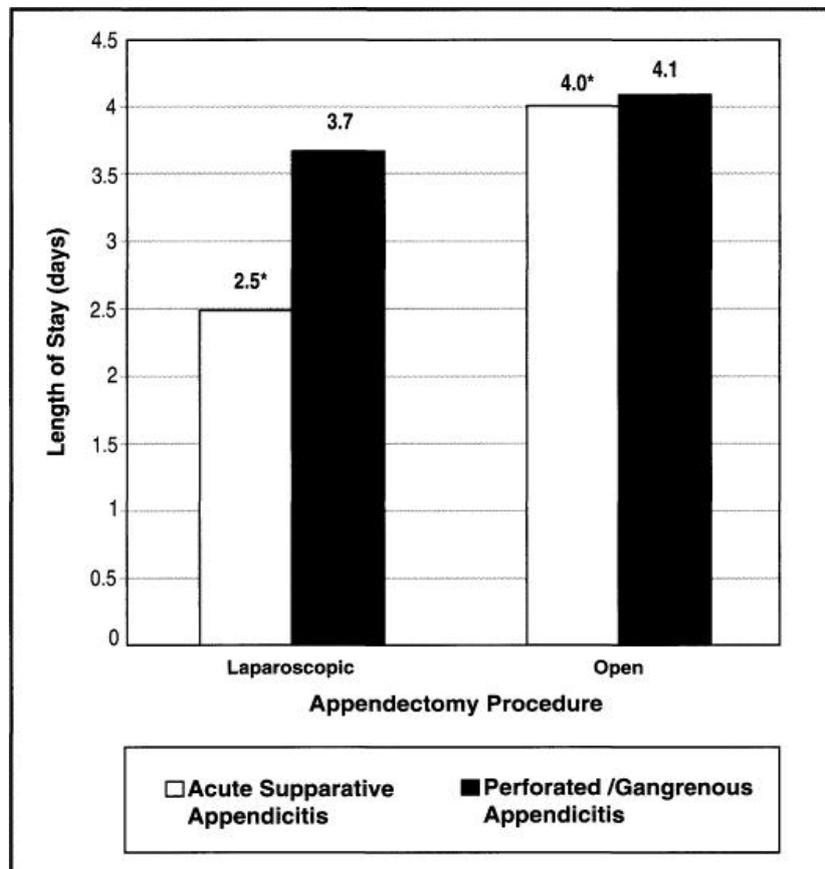
\*Blood clot formation

\*Heart problems

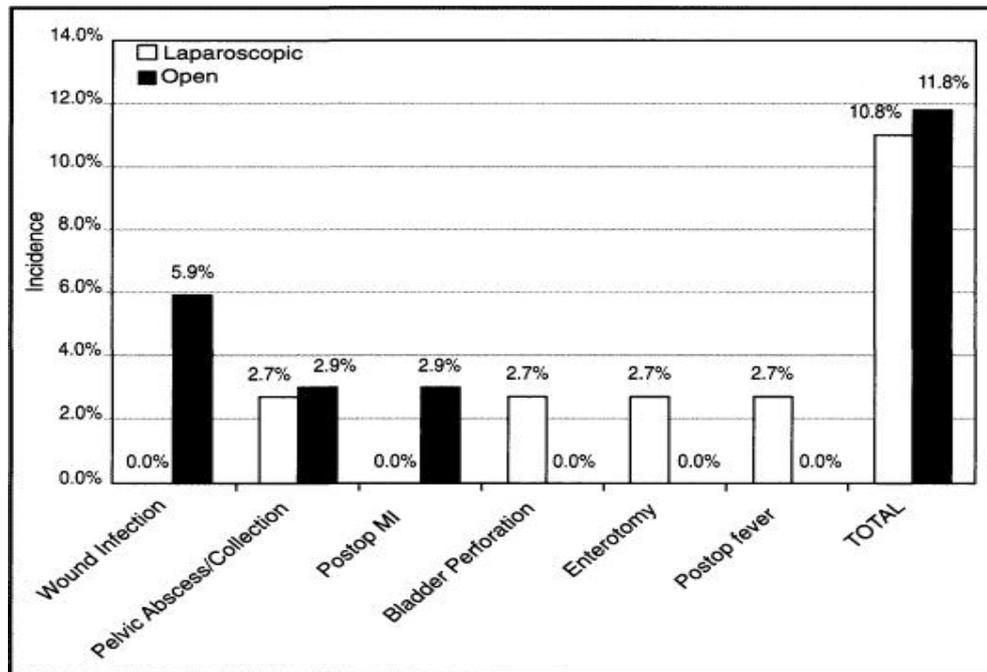
Open appendectomy operation takes about 90 minutes and time for patient to be fully recovered about 3 weeks <sup>10</sup>. This longer time absolutely decreases the patient satisfaction.

**Comparison between laparoscopic and open appendectomy** <sup>(2,10,11)</sup>

	Laparoscopic appendectomy	Open appendectomy
Indications	Acute appendicitis	Perforated appendicitis with infected field.
Post operative pain	Low pain	Painful and patient requires postoperative analgesics
Post operative complications	Less or no postoperative complications	May happen like :abscess, pneumonia, heart problems.
Esthetics	Better esthetics with less scar formation	Lower esthetics with usual scar formation
Length of stay	Few days (2-3)days	(4-5) days, but full recovery may take 3 weeks.
Patient satisfaction	Considered High	Not high specially if complications happened



**Figure 1:** length of stay after appendectomy (comparison between laparoscopic and open appendectomy)



**Figure 2:** Incidence of various postoperative complications and total complications in the laparoscopic and open appendectomy

## CONCLUSION

We concluded that the degree of patient satisfaction and length of stay after appendectomy is variable between patients according to the status of the appendicitis and the operation selected for appendectomy. It has been shown that acute appendicitis with less infection has better results after appendectomy with less postoperative complications rather than perforated appendicitis with infection or abscess formation.

The technique chosen for operation to case with acute appendicitis is usually laparoscopic appendectomy which gives better results with less pain and short length of stay and high patient satisfaction. Whether, in perforated appendicitis with infected field and abscess formation, open appendectomy is preferred and drain may be used, but it was shown that this technique has some drawbacks like: formation of post-operative complications, painful to the patient, longer length of stay, less patient satisfaction.

### Ethical statement

This review article does not require ethical approval.

### CONFLICT OF INTEREST

The author of this manuscript has no conflict of interest to declare.

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