

# Removable Subcuticular Skin Sutures in Open Appendicectomy; Surgeons Fear

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## ABSTRACT

**Objective:** To determine the frequency of wound infection with skin closure by removable subcuticular sutures in non complicated open appendectomy wound.

**Study Design:** Descriptive case series

**Place and Duration of Study:** Department of Surgery Railway Hospital Rawalpindi, Seven months and ten days, from 1<sup>st</sup> Nov, 2009 to 10<sup>th</sup> June, 2010.

**Materials and Methods:** The study was carried out after taking approval from the hospital ethics committee. Seventy three adult patients of either sex admitted in department of surgery with diagnosis of acute appendicitis were included in the study by non probability consecutive sampling. All the patients were explained about the procedure and an informed written consent was obtained. Right grid iron abdominal incision centred over the Mc Burney's point was used to open the abdomen. Appendicectomy was done. In all patients subcuticular stitches by using polypropylene 2/0 were applied to close the skin. All the patients were followed on 3<sup>rd</sup>, 7<sup>th</sup> and 30<sup>th</sup> post operative day for examination of wound . Data was entered in the predesigned Proforma (annexed) for analysis.

**Results:** Out of 73 patients 6(8.2%) suffered from wound infection. Successful open management of the infected wounds was done. Rest of the patients had uneventful recovery.

**Conclusion:** Frequency of wound infection is negligible with removable subcuticular skin suture in non complicated open appendicectomy wound.

**Key words:** *Appendicitis, open appendicectomy, subcuticular skin closure, wound infection.*

## Introduction

The vermiform appendix is a blind ended long, narrow, muscular tube arising from the posteromedial aspect of the caecum, about 1 inch (2.5 cm) inferior to the ileocaecal valve.<sup>1,2</sup> Acute appendicitis is one of the most common abdominal emergencies for which patients attend the emergency department.<sup>3</sup> Appendicectomy is the most commonly performed surgical operation all over the world.<sup>1,4,5</sup> Different etiological and pathological factors are considered in acute appendicitis ranging from infection of appendix to occlusion of the appendicular lumen due to fecolith, lymphoid hyperplasia, parasites and tumor.<sup>6</sup> Appendicitis can be divided into acute non

perforated appendicitis and perforated appendicitis.

Non perforated appendicitis can be further classified into non gangrenous and gangrenous. Typically the patient of acute appendicitis presents with complaint of migratory pain to right iliac fossa, which means the pain initially starts in the epigastrium or pararumbilical region.<sup>7,8</sup> Most of the times this pain is associated with anorexia, nausea and vomiting with guarding, rigidity and rebound tenderness on palpation.<sup>5,9,10</sup> Diagnosis of acute appendicitis is basically done on clinical grounds. However different laboratory and radiological investigations help in supporting the diagnosis.<sup>11,12</sup> The surgical management of acute appendicitis is appendicectomy.<sup>13</sup> This can be done as traditional open appendicectomy, mini appendicectomy or by laparoscopic approach. In cases of non complicated

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appendicitis, after open appendicectomy the skin can be closed by silk, which is applied in interrupted fashion.<sup>14</sup> Conversely prolene or vicryl can be used to close the skin as subcuticular running suture.<sup>15</sup> Choice of suture material depends upon a lot of factors including the patient, tissue, anatomical area, surgeon, and economic factors. In this new era a lot of new materials have been invented which make a surgeon's job difficult to choose any material for closure.<sup>17</sup> Skin can be closed using sutures in interrupted, subcuticular or mattress fashion using absorbable or non absorbable materials.<sup>18</sup> Although the outcomes of surgical skin closure may be influenced by the indication for the procedure, the location of the surgical site, and associated Intraoperative and postoperative complications, the goal of any skin closure technique is to produce appropriate skin approximation and adequate healing with minimal wound complications, scarring, pain, and cost.<sup>16,17</sup>

Infections occurring in surgical incisions were initially called wound infections, but now called as surgical site infection.<sup>7</sup> Multiple etiological factors are involved in the development of SSI. Efforts should be made to adjust the modifiable risk factors. Cigarette smoking, old age and obesity, choice of suture material and suturing technique are known etiological factors for SSI along with the bacteria.<sup>20</sup>

The most common organism is staphylococcus aureus.<sup>21</sup> Surgical site infection is a serious issue which needs to be addressed and efforts should be made at every level starting from the ward, hospital policy and national level to prevent them.<sup>19,20</sup> Since appendicectomy is considered as a

clean contaminated surgery, therefore most surgeons have a fear of closing the wound in a subcuticular fashion due to high risk of wound infection. This study is planned to alleviate this fear of increased risk of wound infection in non complicated open appendicectomy wound having skin closure with removable subcuticular stitches.

### Materials and Methods

A descriptive study was conducted in the Department of Surgery at Pakistan Railway Hospital from 1st Nov, 2009 to 10th June, 2010. Seventy three adult patients of either sex admitted with the diagnosis of non complicated appendicitis were included in the study with convenient sampling technique. Sample size was calculated by using WHO sample size calculator taking confidence level of 95%, population proportion 5% and absolute precision 5%. All male and female adult patients admitted in surgical department who had undergone open appendicectomy for acute appendicitis and their appendix was non gangrenous and non perforated were included in the study.

#### Exclusion criteria

- Known diabetic patients,
- Patients with malignant disease.
- Patients with chronic liver disease.
- Patients with chronic renal failure.
- Patients on steroids.

#### Data Collection

All patients were explained about the procedure and an informed written consent was obtained. Right grid iron abdominal incision was used to open the abdomen. Appendicectomy was done. Peritoneum was closed by vicryl 2/0. Interrupted and continuous sutures by vicryl 1 were applied

to the internal oblique muscle and external oblique aponeurosis respectively. Subcutaneous tissue was closed by vicryl 2/0 interrupted stitches. In all patients subcuticular stitches by using polypropylene 2/0 were applied to close the skin. All the patients received 3 doses of antibiotics (ceftriaxone and metronidazole), 1 at the time of induction of anesthesia and 2 doses post operatively at 12 hour interval. Patients were discharged on 3rd postoperative day after examination of the wound. Stitches were removed at 7th post operative day. All the patients were followed on 7th and 30th post operative day for examination. Data was entered in the preformed Proforma (annexed) for analysis.

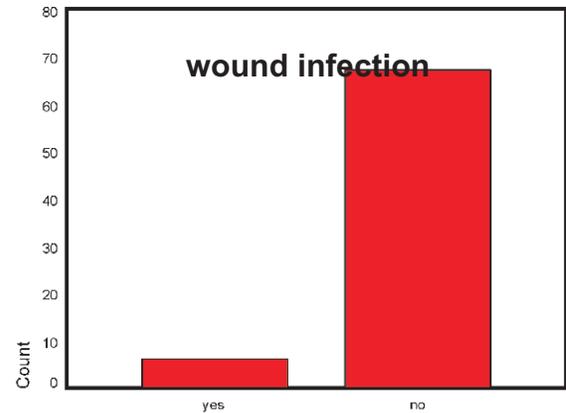
### Results

Data was analyzed by using SPSS version 10. Frequency and percentage was used for qualitative variables i.e. wound infection, pain or tenderness, swelling, redness or heat and pus discharge from the incision on 3rd, 7th, and 30th post operative day.

Out of 73 patients 6(8.2%) suffered from wound infection. Successful open management of the infected wounds was done. Rest of the patients had uneventful recovery.

### Discussion

Appendectomy is considered as a clean contaminated surgery, therefore most surgeons have a fear of closing the wound in a subcuticular fashion due to high risk of wound infection. This study was planned to alleviate this fear of increased risk of wound infection in non complicated open appendectomy wound having skin closure with removable subcuticular stitches. Our study supports that the wound after open appendectomy in non



**Figure 1: Frequency of Wound Infection in Study Group (n= 73).**

perforated non gangrenous appendix can be closed by subcuticular removable sutures by prolene. In our study wound infection occurred in 6 patients (8.2%) only.

A randomized controlled trial was conducted by Hamid Ghaderi et al in Imam Khomeini hospital Tehran in 2010 to compare the wound infection rate after open appendectomy in non complicated appendicitis. They took 278 patients admitted via emergency department and divided them in two groups. In one group the wound was closed by interrupted method and second group wound was closed by subcuticular prolene stitch. They did not find any gross difference in wound infection, 08 patients in interrupted group and 05 patients in subcuticular group with a p value of 0.415. So they concluded that frequency of wound infection doesn't increase with application of non absorbable suture in non open appendectomy wounds.<sup>15</sup> Fashina IB, and associates in 2009 conducted a prospective study in 250 cases of appendicitis in Department of Surgery, College of Medicine, University of Lagos and Lagos University Teaching Hospital, Idi-araba, Lagos, Nigeria. They analyzed the way of presentation, management, operative findings and management

outcome in patients of acute appendicitis. They found that 08 % of the patients had wound infection.<sup>22</sup> It was controlled clinical trial in which they divided the patients in two groups. In one group the wound was closed interrupted method and other by subcuticular method. They concluded that there is no significant increase in the wound infection rate when wound is closed with subcuticular technique.<sup>22</sup>

Another study done by A. Hussain and associates to evaluate the wound infection incidence in patients with acute non complicated appendicitis and perforated and gangrenous appendicitis. This was an observational study which was carried out on 400 patients with gangrenous or perforated (50%) and simple appendicitis (50%). Both groups underwent primary wound closure. Wound infections were observed in 15 patients (3.7%), including 6 cases of simple and 9 cases of gangrenous appendicitis which was not statistically significant.<sup>14</sup>

### Conclusion

Frequency of wound infection is 8.2% with removable subcuticular skin suture in non complicated open appendicectomy wound. The result of this study is comparable to studies conducted elsewhere in clean contaminated surgeries like appendicectomy the wound infection is 5 10 %. So it is concluded that by using prolene in subcuticular fashion the rate of wound infection does not rise. It implies that the fear of surgeons to close the appendicectomy wounds by subcuticular closure is baseless.

### Recommendations

It is recommended that the skin should be closed with removable subcuticular sutures in non complicated open appendicectomy

wound as it does not increase the rate of wound infection.

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