

# Mini incision Appendectomy for Acute Uncomplicated Appendicitis: An Alternative to Laparoscopic Appendectomy

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**Abstract:** ***Background:** Appendicitis is the most common surgical emergency worldwide, requiring immediate surgical intervention. Appendectomy for appendicitis is the most commonly performed emergency operation in the world. Appendectomy is being performed either by conventional or by laparoscopic means. In our study, one new technique of appendectomy called mini incision appendectomy was being performed in one hundred and fifty patients in GMC Srinagar, tertiary care hospital in Jammu & Kashmir, India. **Materials and Methods:** A total number of one hundred and fifty patients between the ages of 10 years and 60 years, diagnosed as acute appendicitis, were included in the study. All of these patients underwent this new technique of mini incision emergency appendectomy. The study was carried out over a period of four years from 2013 to 2017 and various variables in the form of length of incision, operative time, analgesia requirement, complications, length of hospital stay and return to normal activity were calculated. **Results:** Mini incision appendectomy was performed successfully in one hundred and fifty patients, in the age group of 10 to 60 years with a small transverse incision (2 to 3 cms long) in the right lower abdomen, starting from the lateral border of rectus muscle and extended laterally upto the McBurney's point. The time taken to complete the operation was 15-40 minutes (average 24.24 minutes), 5 patients (3.33%) required extension of incision and 3 patients (02%) developed wound infection, which was managed conservatively. There was no mortality, better cosmesis and almost invisible scar observed in our study. **Conclusion:** Mini incision appendectomy is a safe and cosmetically better technique of performing appendectomy, and can be successfully used as an alternative to laparoscopic appendectomy.*

**Keywords:** Appendicitis, Appendectomy, Mini incision, Rectus muscle

## 1. Introduction

In 1886, Reinald Fitz, a professor of pathologic anatomy at Harvard, coined the term appendicitis and identified the appendix as primary cause of right lower quadrant inflammation.<sup>1</sup>

The credit for performing the first appendectomy goes to Claudius Amyand, a surgeon at St. George's Hospital in London, who performed an appendectomy in 1736 to remove a perforated appendix within the hernia sac.<sup>2</sup> In 1889, Charles McBurney described the McBurney's point as the point of maximum tenderness and described the incision that bears his name.<sup>3,4</sup> Charles McBurney's grid-iron incision for appendectomy remained incision of choice for more than a century, until few newer incisions were devised like Rutherford Morrison's incision, Rocky Davi's incision, Battle's incision and Lanz incision.

After the invent of minimally invasive procedures in the field of surgery, especially after the invent of laparoscopic surgery, a tidal wave has been set in with much enthusiasm among the surgical fraternity for minimally invasive surgery in order to provide better cosmesis and early recovery to the patient. Surgeons have tried from time to time to provide cosmetically better incisions for appendectomy.<sup>5,6,7</sup>

Laparoscopic appendectomy, first reported by the gynaecologist, Kurt Semm, in 1982, is becoming the widely acceptable surgical modality of treatment for appendicitis.<sup>8</sup> In spite of advantages offered by laparoscopic appendectomy, such as shorter hospital stay and earlier return to normal activity, there is still a controversy over the

best mode of appendectomy in the literature.<sup>9</sup> As an alternative to laparoscopic appendectomy, our study is based on a small transverse incision (mini incision) appendectomy, about 2 to 3 cms in length given over the lateral border of rectus muscle and extended laterally upto the McBurney's point. The aim of this study was to evaluate the feasibility, safety and advantages of using the technique of mini incision appendectomy, which can be used as an alternative to laparoscopic appendectomy.

## 2. Materials and Methods

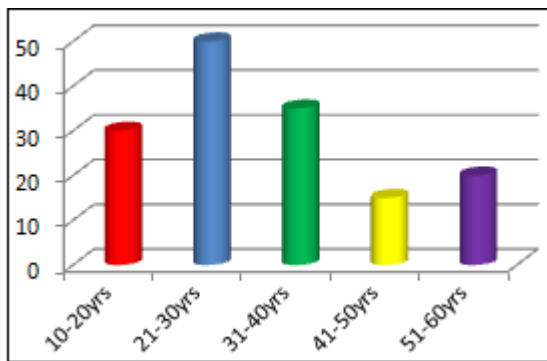
150 patients, 68 males and 82 females, in the age group of 10 to 60 years with clinical and radiological findings of acute uncomplicated appendicitis were subjected to mini incision emergency appendectomy, either under general or spinal anaesthesia. Patients with diagnosis of perforation peritonitis, appendicular mass, appendicular abscess and obese patients were excluded from the study.

A small transverse incision was made over the lateral border of rectus muscle and extended laterally for 2 to 3 cms towards the McBurney's point. Anterior rectus sheath was incised in line with the skin incision and rectus muscle retracted medially with the help of Langenbuch's retractors. Peritoneum was incised in line with the skin incision. Appendix was palpated with the help of index and middle finger and delivered with the help of these two fingers or babcock forceps. Appendectomy was performed as per the standard protocol. Peritoneum was not closed and anterior rectus sheath was closed with absorbable suture. Skin was closed with interrupted or subcuticular non-absorbable suture.

Following parameters were analyzed in our study: incision length, operative time, analgesia requirement, postoperative complications, length of hospital stay and time to return to routine activity.

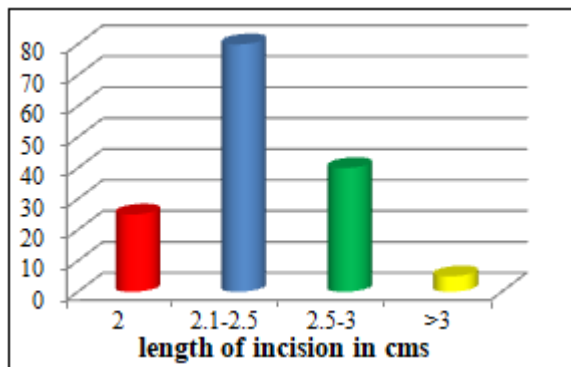
### 3. Results

The study was carried out on a total of 150 patients, among which 68 were males and 82 were females. The patients included in the study were of different age groups, ranging between 10 to 60 years, as depicted in figure 1. Maximum number of patients were in the age group of 21 to 30 years.



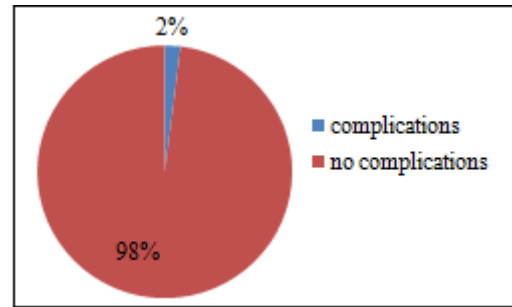
**Figure 1:** Distribution of age.

Mini appendectomy was successfully performed in 145 patients, with 5 patients (3.33%) requiring an extension of incision to 4cms maximum. Length of incision was 2cms in 25 patients (16.67%), 2.1-2.5cms in 80 patients (53.33%) and 2.5-3cms in 40 patients (26.67%), as depicted in figure 2.



**Figure 2:** Length of incision.

Average operative time was 24.24 minutes, and average doses of analgesia required were 2.87 doses. Postoperative complication in the form of wound infection, as shown in figure 3, was noted in 3 patients (2%), which was managed conservatively. Average length of hospital stay was observed to be 2.33 days, and average length of time to return to routine activity was observed to be 7.43 days.



**Figure 3:** Percentage of complications (wound infection)

Intravenous fluids were stopped and patients were put on oral liquids on the first postoperative day. In follow up period ranging from two weeks to six months, no serious complications were observed and patients were satisfied with the small scar and overall outcome of the surgery. The results of the study are shown in table 1.

**Table 1:** Perioperative parameters in mini incision appendectomy

| Parameter             | Mini appendectomy     |
|-----------------------|-----------------------|
| Length of incision    | 2-3cms                |
| Operative time        | 15-40mins(24.24mins)  |
| Extension of incision | 05 cases (3.33%)      |
| Analgesia required    | 2-4 doses(2.87doses)  |
| Wound infection       | 03 cases (2%)         |
| Hospital stay         | 2-3 days (2.33 days)  |
| Return to activities  | 6-10 days (7.43 days) |

### 4. Discussion

Acute appendicitis is the most common general surgical emergency, requiring immediate surgical intervention which improves outcomes. Charles McBurney pioneered early diagnosis and early operative intervention devising muscle splitting incision for appendectomy named after him.<sup>3,4</sup> McBurney's incision is more than a century old but still most frequently used incision for appendectomy. As the civilization advanced and with the introduction of minimally invasive procedures, strong desire of patients to avoid abdominal scars have encouraged many surgeons to use a variety of cosmetically acceptable incisions for appendectomy.

Kurt Semm first reported successful laparoscopic appendectomy in 1983<sup>8</sup>, but first published laparoscopic appendectomy was reported in 1987.<sup>10</sup> The utility of laparoscopic appendectomy in the management of acute appendicitis remains controversial. This may be due to the fact that appendectomy, by virtue of its small incision, is already a form of minimal-access surgery.<sup>11</sup> Saurland S et al in the Cochrane database analyzed 54 studies comparing open to laparoscopic appendectomy and observed the duration of surgery and cost of operation were higher for laparoscopic appendectomy than for open appendectomy and also observed that the rate of intra-abdominal abscess was three times higher after laparoscopic appendectomy than after open appendectomy.<sup>12</sup>

In a similar study by AC Moberg et al; they compared the recovery time after laparoscopic versus open appendectomy on one hundred and sixty three patients found no difference in recovery time, complication rates and mean hospital stay

in the patients.<sup>13</sup> In another study by Raphael SC et al; found that laparoscopic appendectomy takes 31% longer time to perform but post operative pain and lower wound infection rates by 60%.<sup>14</sup> Houchuan L et al in 2004, did a study on mini appendectomy in which the length of incision was between 2.5 to 3 cms (average 2.7cms).<sup>15</sup> Bhasin SK published an article in 2005 on mini appendectomy in 100 cases and concluded that this technique enables less hospital stay and less requirement of analgesia.<sup>16</sup> Ling L et al performed a case study on 316 patients in 2009 and reported similar results for small incision appendectomy.<sup>17</sup>

Shah B et al concluded in his study, that small incision open appendectomy is better than laparoscopic appendectomy in terms of operative time, time to return to daily activity and complications, and that the cost was higher in laparoscopic appendectomy group compared to small incision open appendectomy.<sup>18</sup> Sundaravadanan B S et al published an article in 2017 on mini incision appendectomy - an analysis of 70 cases and concluded mini incision appendectomy is associated with less operative time and is cost effective.<sup>19</sup>

## 5. Conclusion

The results of our study concluded that the use of this new technique of mini incision appendectomy is better than conventional appendectomy in terms of cosmesis and less requirement of analgesia. At the same time, it was observed to be associated with less operative time and much cost effective compared to laparoscopic appendectomy. Hence, mini incision appendectomy is a safe and advantageous technique, which can be successfully used as an alternative to laparoscopic appendectomy.

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