Button hole, Single stitch, Non-laparoscopic Appendectomy in a Tribal District Hospital, Advantage over Laparoscopy

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Abstract

**Background:** The purpose of the study is to analyze, feasibility, utility and advantage of using Single Stitch Non-Laparoscopic Appendectomy for patients with acute appendicitis in a Hospital located in Tribal District. **Methods:** A total number of 1000 cases diagnosed as acute appendicitis, 100 cases selected for this technique by following inclusion criteria who where then operated with a special technique from July 2012 to December 2015. All these cases were operated under Spinal Anesthesia. **Results:** There were no complications and post operative mortality, except wound infection in two cases out of 100 and post operative stay was only for 2 days. **Conclusion:** The technique had no significant difference in peri-operative complications, post operative pain and patient satisfaction. Hence Single stitch Non laparoscopic appendectomy is a safe and advantageous technique in performing appendectomy in Hospitals where there is generally lack of sophisticated equipments.

**Keywords:** Acute Appendicitis, Single Stitch Technique, Laparoscopic appendectomy

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Introduction

Appendicitis is the most common cause of an acute surgical abdomen, in spite of recent advances in diagnosis and treatment it is still associated with significant morbidity (10 %) and mortality (1–5 %). [1] The decision to perform surgical exploration in suspected appendicitis involves diagnostic accuracy, patient age and co-morbidity, the surgeon’s core medical values, expected natural course of non-operative treatment and priority considerations regarding the use of limited resource. [2] Open appendectomy is accepted as a standard treatment. Open appendectomy that was first described by McBurney in 1894 has long been applied as the gold standard procedure [3]. Since Semm in 1983 introduced laparoscopic appendectomy, it is now becoming more accepted. [4] Many advantages of laparoscopic appendectomy have been shown such as lower hospital stay, shorter recovery period, shorter period for returning to daily activities, lower postoperative pain, and lower postoperative infections. With the widespread application of laparoscopy, more useful hand-tools were developed and it became possible to perform all gastrointestinal surgical procedures laparoscopically over time with increasing clinical experience. In spite of these advantages, there is controversy over the best model of appendectomy technique in the literature. [5] Despite the given facts Open appendectomy is still most common procedure adopted in cases of appendicitis especially in rural areas. [6] This study was aimed to show the superiority of this particular technique called Button hole single stitch technique compared to laparoscopic appendectomy, highlighting the advantages in a Hospital located in Tribal areas where there is a lack of sophisticated equipments.
**Materials & Methods**

**Objectives of Study**
1) Formulating certain criteria for selection of cases to be done with this technique (Single Stitch Non Laparoscopic Technique-SSNLT). 2) To compare the advantages of this technique over conventional laparoscopy. A total 1000 cases of with diagnosis of Acute Appendicitis were admitted in RIMS Hospital, Adilabad from July, 2012 and December, 2015, out of which 100 cases were selected for this study.

The following Inclusion criteria were used in selecting the cases for this technique. [7-9]

1) Slim individuals
2) Appendicitis < 24 hours duration.
3) Marked tenderness and guarding at Mc Burney’s point.
4) Palpable appendix after fully relaxation of abdomen under Anesthesia.
5) Ultra Sonographic findings like:
   a) Clear visible Appendix.
   b) Diameter > 6 mm
   c) Thickened & Edematous Wall.
   d) Presence of faecolith.
   e) Appendix seen superficial to bowel loops.

Out of 5 formulated criteria, if any 3 criteria were met, then case was selected for this surgery. By these criteria 100 cases were selected for this study.

The following ultrasound findings were contraindications for this technique:
   a) Poor window.
   b) Early mass formation.
   c) Retrocaecal Appendix
   d) Perforated Appendicitis with fluid collection in Right iliac fossa
   e) With tip of appendix going subhepatically into lumbar region.

**Procedure**
Under Spinal Anesthesia, ½ inch incision is given at the McBurney’s point, parallel to spino-umbilical line. Skin and Subcutaneous tissues incised, and cut is given to external oblique aponeurosis. Then Transversus Abdominis Muscle is split. Index finger is introduced and muscles are separated and adequate space is created in the peri-peritoneal area. Retraction of muscles is done by opposite end of non-toothed forceps and peritoneum is opened. Caecum is identified and Babcock’s forceps is applied for the Taenia Coli. Then it is pulled out with a technique called “PULL AND PUSH”. The base of appendix is identified and appendix is delivered through the wound and appendectomy done. The wound is closed in layers. In almost all cases only single stitch was enough to close the skin wound. Liquids were allowed orally after 6 hours. The patients were discharged on 3rd post operative day. A combination of antibiotics - Cefixime and Metronidazole were given. Pain killers like Diclofenac Sodium and Tramadol were given only on day of operation.

**Results**
In all the 100 cases, only single stitch was enough for closing the abdomen. No extension of incision was required as the inclusion criteria were strictly followed. There were no significant postoperative complications except wound infection in 2 cases. Early ambulation, less hospital stay, less analgesics, and the cosmetic effect of wound was similar to a laparoscopic appendectomy. The near perfect patient satisfaction score was 9.3 (O = poor satisfaction, 10= excellent satisfaction) were obtained.

*Figure 1:* showing the Percentage of complications

*Figure 2:* showing the age wise distribution of the patients
The table 1 shows the number of post operative complications encountered after the surgical procedure it is very clear that there were no significant post operative complications reported except 2 cases were of suture abscess which were conservatively managed with antibiotics and it successfully resolved completely.

Table 2 shows the patient satisfaction sheet which was given to individual patient to complete in their own language during the time of their discharge. It shows that about 77% of patients have given excellent grade to the surgical procedure and 19% have reported as good and 4% have reported as fair. This clearly shows better outcome and complete patient satisfaction in this procedure.

Table 3 shows that there were no follow up complication reported by any patient after 15 days and one month follow up after the surgical procedure. This denotes excellent outcome of the procedure.

Discussion

There is general increase in trend towards laparoscopic appendectomies because of its advantages. However carefully selected and well performed Single Stitch Non Laparoscopic Technique SSNLT can achieve remarkable success on par with Laparoscopic Technique and especially in Tribal areas where there are limited resources and equipments present such as Laparoscope this technique is viable alternative. With the above study we found the following advantages of this technique over LAP.

Table 4: showing comparison between LAP (Laparoscopic Appendectomy) with SSNLT (Single Stitch Non Laparoscopic Technique of appendectomy)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>LAP</th>
<th>SSNLT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anesthesia</td>
<td>General Anesthesia (Most of the cases)</td>
<td>Spinal</td>
</tr>
<tr>
<td>2</td>
<td>Duration of procedure</td>
<td>More</td>
<td>Less</td>
</tr>
<tr>
<td>3</td>
<td>Equipment</td>
<td>Costly</td>
<td>Routine instruments</td>
</tr>
<tr>
<td>4</td>
<td>Training &amp; Experience</td>
<td>Required</td>
<td>Routine procedure</td>
</tr>
<tr>
<td>5</td>
<td>Staff</td>
<td>Specialized trained staff is required</td>
<td>Routine staff</td>
</tr>
<tr>
<td>6</td>
<td>Hospital Stay</td>
<td>2 to 3 days (min)</td>
<td>Same</td>
</tr>
<tr>
<td>7</td>
<td>Overall Expenditure</td>
<td>Costly</td>
<td>Cost effective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>i) Complications of Anesthesia</td>
<td>NIL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii) Bowel injuries</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii) Burn of Bowel due to defective instruments</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Complications</td>
<td>3 ports are introduced with three incisions</td>
<td>Only single small incision</td>
</tr>
<tr>
<td>9</td>
<td>Cosmetic Appearance of the wound</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In this study, 100 patients of acute appendicitis were selected based on age, sex and above mentioned criteria. These 100 patients underwent elective SSTNL surgery. Patients Detailed History, Physical Examination, Operative Details, Post operative complications, Length of Hospital stay, Pain scores, Analgesic requirements and Patient satisfaction scores were collected. There were 60 males and 40 females in the study, and with different age groups 32 were of < 15 yrs, 35 were of 15-30 yrs, 20 were of 20-30 yrs, 13 were of >45 yrs. And they were operated and there are no perioperative complications. The post operative pain score was measured by a scale from 0 to 10 (0 = No Pain, 10 = Severe Pain). The Hospital stays of patients were recorded. The near patient satisfaction score Average was 9.31 (0=Poor, 10=satisfied). There was only wound infection in 2 of 100 patients on 3rd post operative day, rest of patients recovered with no complications. The patients were discharged on day-3 and followed for 12 months. No complications were noticed till 12 months. This study was performed to find the advantages of SSTNL over LAP Appendectomy in Tribal Areas, where the infrastructure and training facilities are generally low.

In a similar study by AC Moberg et al; they compared the recovery time after Laparoscopic Vs Open appendectomy on one hundred and sixty three patients found no difference in recovery time, complication rates and mean hospital stay in the patients. [10] It agrees with our findings where we found mean hospital stay of 2 days. This shows that if this surgical procedure is performed by experienced surgeons its results are often comparable to Laparoscopic procedures. In another study by Raphael SC et al; found that Laproscopic appendectomy takes 31% longer time to perform but post operative pain and lower wound infection rates by 60%. [11] In tribal areas like ours where lack of sophisticated equipments of Laparoscopy we innovated this modified open appendectomy procedure SSTNL surgery. The results obtained are comparable to Laparoscopic appendectomy. Another interesting finding by Kristen Hall et al; found that while the laproscopic appendectomy is associated with statistically significant but questionable advantage over open appendectomy. This shows that although Laparoscopic appendectomy has advantage over the conventional appendectomy. [12] It indicates that a well performed and carefully done open appendectomy is often comparable with Laparoscopic procedures. Although strictly speaking our procedure is not a conventionally done open procedure but it is a modified version of the open procedure where a very small incision like Button hole is given and procedure is followed. However we have to bring to the fact that our surgeons were very experienced and we strictly followed the selection criteria which are of utmost importance in this kind of procedure. It may be very well considered as alternative to Laparoscopic procedures in areas where there is lack of sophisticated equipments and facilities like ours. This SSTNL technique appears to be more beneficial in terms of cost, training, post operative complications and hospital stay over laparoscopic appendectomy.

**Conclusion**

The results of single stitch appendectomy where comparable to LAP appendectomy in terms of training, cost and hospital stay and post operative complications. The technique had no significant difference in peri-operative complications, post operative pain and patient satisfaction. Hence Single stitch Non laparoscopic appendectomy is a safe and advantageous technique in performing appendectomy in Hospitals where there is generally lack of sophisticated equipments.

**Conflict of Interest:** None declared

**Source of Support:** Nil

**Ethical Permission:** Obtained

**References**


