ORIGINAL ARTICLE

# A Comparitive Study of Mini-Appendectomy & Conventional-Appendectomy in Acute Appendicitis

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**Abstract**

The study was undertaken in an attempt to compare Mini-appendectomy with Conventional-appendectomy. 200 patients each in two groups were subjected to mini-appendectomy with 2-2.5 cm transverse incision (Group I) and conventional-appendectomy with standard Grid-Iron incision 6-8 cms (Group II). There were 92 males and 108 females in Group I whereas, 98 males and 102 females were subjected to conventional-appendectomy in Group II. Average age of patients in Group I was 22.3 years (5-65 yr) whereas, in Group II average age was 22.4 years (7-65 yr). Average weight of pts in Group I was 45.7 Kgs (20 kgs to 60 kgs) and 50.2 Kgs (24 kgs to 68 kgs) in Group II. Average time taken to complete surgery in Group I and Group II was 11.4 mt (11-35 mt) and 26.4 mt (25-45 mt) respectively. Average dose of analgesic used in Group I and II were 2.2 doses (2-4 doses) and 4.2 doses (4-8 doses) respectively. Post operative hospital stay in Group I was 2.14 days (2-5 days) and 4.34 days (4-11 days) in Group II. Time to return to work in Group I was 8.2 days (8-12 days) and 13.2 days (9-21 days) in Group II. There was no mortality and negligible morbidity in both the study groups. Mini-appendectomy has definite edge over conventional-appendectomy in terms of operation time, analgesics used, post-operative hospital stay, and return to work hence can be a safe alternative to conventional-appendectomy.

**Key Words**

Acute Appendicitis, Mini-Appendectomy, Conventional-Appendectomy, Rectus Muscle

## Introduction

Mc Burney's Grid Iron incision for Appendectomy remained incision of choice even after more than one century since it was devised. Similarly Appendectomy has remained standard treatment two centuries after first ever chance appendectomy done by Cladius Amyand (1736). He performed appendectomy in 11 year old child with scrotal hernia wherin he found a pin perforating appendix.(1,2) Similarly Kronlein (1886) published his experience of appendectomy (3) Since the days of Mc Burney who devised muscle-splitting incision for appendectomy very few incisions have been devised (Rocky Dave's, Rutherford Morison's, Battle's incision and lately Lanz incision etc for appendectomy. (3,4) After the invent of Laparoscopic surgery, a tidal wave have been set in with much enthusiasm among the surgical fraternity for minimally invasive surgery in order to give better comfort, better cosmesis and early recovery to the patients. The strong desire of patients especially females to avoid abdominal scar has encouraged many surgeons to use a variety of incisions for abdominal visceral surgery that are hidden from exposure. Surgeons have tried from time to time cosmetically better incision for appendectomy (5-7) but without following them thereafter. Laparoscopic-appendectomy has failed to establish as Gold standard unlike Laparoscopic-cholecystectomy (8 to 16) on one hand. And on the other hand Conventional appendectomy with standard Grid Iron incision in the era of minimally invasive surgery is being viewd as incision with lot of morbidity in terms of scar, pain, delayed return to routines and increased incidence of wound infection etc. (17,18,19) We have already shared our experience of Mini-appendectomy. (20,21) In order to weigh the benefits of Mini-appendectomy and Conventional-appendectomy over each other we are presenting here a comparative study of Mini-appendectomy and Conventional-appendectomy, probably the first ever study of such nature related to the subject.

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## Material and Methods

The study was conducted in Govt. Medical College, Jammu, J&K from June 2003 to June 2010. 200 patients each were divided in two groups, Group I (Mini-appendectomy) and Group II (Conventional-appendectomy). In Group I there were 92 males and 108 females in the age group of 05-65 years whereas; in Group II there were 98 males and 102 females in the age group of 7 to 65 years. All the patients were operated upon under either SA or GA. Patients with clinically apparent appendicular lump, perforation peritonitis, marked obesity and doubtful diagnosis were not taken up for Mini-appendectomy (Group I).

### *Operative Technique*

For Conventional-appendectomy: We used standard Grid - Iron incision 6 to 8 cms in length and completed the procedure by standard steps. In 03 cases we had to convert it into muscle cutting Rutherdford-Morrison incision.

For Mini-appendectomy: Mc Burney's point and lateral boarder of the right rectus muscle was marked. Incision was started on the lateral border of rectus muscle and extended transversally 2 to 2.5 cm towards Mc Burney's point. Anterior sheath was cut in line of the skin incision and rectus muscle retracted with the help of long pronged Skin/Czerni's/Langenbuch's retractors. Peritoneum is cut in the line of skin incision. Once we reach abdominal cavity, retractors are removed and subsequently it requires little effort and manipulation to trace the appendix. We could not come across any abnormally placed appendix in any of our cases. Rest of the procedure of appendectomy is done as per the standard protocol. We do not close peritoneum and retracted muscle comes to its place once the anterior sheath is sutured back. Skin is closed either with interrupted silk or subcuticular prolene or skin stapplers. In three cases where incision was extended, rectus muscle medially and external oblique/ internal oblique/transverses abdominus laterally were cut partially for the better exposure. No special retractors are required for the procedure.

## Results

In Group I, Mini-appendectomy was successfully completed in 196 patients and 04 patients requiring extension of incision maximum up to 5cms.Whereas, in Group II, Conventional-appendectomy with Grid Iron incision was completed successfully in 197 patients, 03 patients requiring conversion to muscle cutting Rutherford-Morrison's incision. In Group I operation time, Analgesics use, Hospital stay, Time to return to work was much less than what was observed in Group II. The minor complications observed were 5% (n=08) in Group I in comparision to 10% (n=20) in Group II. No long term complicatins were observed in either group. Details of the results are given in Table I-IV.

*Table. I Peri-operative Parameters in Mini-appendectomy & Conventional-appendectomy*

| Parameter | Mini-appendectomy | Conventional-appendectomy |
|---|---|---|
| Length of incision | 2 to 2.5 cms (2.27 cm) | 6-8 cms (6.32 cm) |
| Operation time | 11 to 35 mts (11.4mts) | 25 to 45 mts (26.4 mts) |
| Incision extension | 04 cases | 03 cases |
| Analgesics used | 2 to 5 doses (2.13 doses) | 4 to 8 doses (4.2 doses) |
| Hospital stay | 2 to 5 days (2.14 days) | 4 to 11 days (4.34 days) |
| Return to routines | 8 to 10 days (8.2 days) | 9 to 21 days (13.2 days) |
| Satisfaction with scar | 98% (n=196) | 65 % (n=97) |
| Minor Complications | 4% (n=08) | 10% (n= 20) |

*Table. II Per-operative Findings*

| Operative findings | Mini-appendectomy | Conventional-appendectomy |
|---|---|---|
| Acute inflammation | 185 | 170 |
| Gangrene of the tip | 02 | 04 |
| Appendicular lump | 02 | 07 |
| Asoociated Meckle's diverticulum | 02 | 02 |
| Meckle's diverticulitis | 00 | 01 |
| Appendicular perforation(including tip) | 01 | 10 |
| Normal | 06 | 06 |

## Discussion

Credit of first published appendectomy goes to Kronlein (1886). His patient, who was 17 year old died two days after the surgery. (2,3,22) Mc Burney (1889) took the credit to pioneer early diagnosis and early operative intervention devising muscle splitting incision for appendectomy named after him.(23,24) Mc Burney's incision is more than a century old but still the most frequently used incision for appendectomy. Over a period of time it has been learnt that the standard incision has its

*Table. III Reasons for Extending Incision.*

| Reason | Mini-appendectomy | Conventional-appendectomy |
|---|---|---|
| Apendicular lump | 01 | 02 |
| Subserosal retrocaecal | 02 | 01 |
| Meckle's diverticulum | 01 | 00 |

own disadvantages big scar, ventral hernias, post-operative pain etc. The civilization advanced and strong desire of patients especially the female to avoid abdominal scar has encouraged many surgeons to use a variety of cosmetically better incisions in visceral surgery. For appendectomy very few surgeons have worked on the subject that too without following their work, hence this area of one of the most common emergency visceral surgery remained without an established minimally invasive incision. Since the first published laparoscopic cholecystectomy in 1987 by Phillipe Mouret, there had been a real revolution in the field of visceral surgery. (25) Kurt Semm did first laparoscopic appendectomy in 1983 (26) but first published laparoscopic appendectomy was reported in 1987. (27) Unfortunately like small incision, laparoscopic appendectomy too have failed to establish itself as surgical technique of choice for acute appendicitis, laparoscopic equipment being expensive and takes longer operating time. (8-16,28-33) Suh tried small incision 1.5 to 2.5 cm (microceliotomy) combined with laparoscopic instruments to diagnose and do subsequent appendectomy. (34) It too have failed to establish, as it losses its essence where concomitant facilities of laparoscopic instruments are not available.

Enthused by minimally invasive surgery and successful outcome of our initial experiences of Mini-appendectomy (21, 22), we have sucessfuly compared two techniques of appendectomy Mini-appendectomy (Group I) versus Conventional-appendectomy (Group II) in acute appendicitis. We have observed from the present study that Average Operation time of Min-appendectomy is 11.4 mts against 26.4 mts in Conventional-appendectomy. Similarly Analgesic used in Mini-appendectomy was 2.13 doses against 4.2 doses in Conventional-appendectomy; Hospital stay was 2.14 days in Group I and 4.34 days in Group II. Patients took 8.2 days in Group I to return to routine work against 13.2 days in Group II. Minor

*Table. IV Post-operative Complications*

| Complication | Mini-appendectomy | Conventional-appendectomy |
|---|---|---|
| Post-operative Fever | 03 | 10 |
| Ant. Abdominal wall hematoma | 01 | 00 |
| Ant. Abdominal wall abscess | 01 | 00 |
| Wound infection | 03 | 08 |
| Paralytic Ileus | 00 | 02 |

complication observed in Group I were fever (n=03), abdominal wall hematoma (n=01), abdominal wall abscess (n=01) and wound infection in 03 patients. In Group II fever was observed in 10 pts, wound infection in 08 pts and Paralytic Ileus in 02 patients. 04 patients in Group I required incision extension maximum up to 5cms, whereas, in Group II 03 patients had to be converted to Muscle cutting Rutherford-Morrison's incision. No long term complications were observed in either group.

**Conclusion**

"The Bigger the Surgeon, the Bigger the incision" have lost its essence in the present era of minimally invasive surgery. Our experience of present comparitive study of Mini-Appendectomy and Conventional-appendectomy reveals that Conventional-appendectomy with standard Grid-Iron incision beyond doubt has advantages in the treatment of appendicular lumps, perforated appendicitis etc. But Mini-appendectomy done by the mentioned technique is safe, cosmetically much better without mortality and negligible morbidity in comparision to conventional-appendectomy. Furthermore, Mini-appendectomy enables less operative time, less hospital stay, less need for analgesics and early return to the routine in comparision to Conventional-appendectomy. Small incision causes less tissue trauma and anoxia, thereby, decreasing risk of pain, wound infection and incisional hernia. In obesity Mini-appendectomy has disadvantage. The more enthusiastic aspect is that the success rate of Mini-appendectomy is 98%, that means almost all the patients of Acute appendicitis with average built can be taken up for the procedure abandoning Conventional-appendectomy in favour of Mini-appendectomy. We believe that experience in the field of Mini-appendectomy needs further evaluations with respect to its comparisons with Laproscopic appendectomy in order to establish it as a minimally invasive procedure of choice for appendectomy.

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