

CONVENTIONAL APPENDICECTOMY VIA TRANS UMBILICAL APPROACH - OUR INSTITUTIONAL STUDY

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ABSTRACT: BACKGROUND: The aim of this study was to evaluate the safety, feasibility, and cosmetic result of a novel approach i.e. conventional appendectomy via the trans umbilical route using routine open surgery instruments. **PATIENTS AND METHODS:** This retrospective study included 40 selected cases during period from Jan 2011 to April 2013 in Shimoga Institute of Medical Sciences, Shimoga, Karnataka. Inclusion criteria were a thin built patient with lax abdominal wall, acute classical presentation in early stage of appendicitis, cases posted for interval appendicectomies, recurrent attacks of appendicitis or appendicular dyspepsia and also patients with positive clinical, laboratory and clear cut ultrasonography findings. Excluded from study group were those patients who presented few days later after acute attack, or with complications of mass formation /abscess, undiagnosed obscure causes of RIF pain with no classic history or findings and patients with pelvic peritonitis. **RESULTS:** Conventional appendicectomy was safely performed in 32 out of 40 cases studied, through single incision trans umbilical route. In remaining 8 cases an additional right iliac fossa incision with muscle cutting had to be employed for dissection of adhesions and retrocaecal /subhepatic positions of inflamed appendix and auto appendectomy with fecolith dislodgement which was observed intraoperatively in 2 cases. The calculated conversion rate was about 20 %. The mean operative time was almost same compared to routine surgery by Mc Burney incision (25 min v/s 22 min). The average hospital stay was 4 days. All patients were followed up for 3-6 months. 8 cases reported with seroma and mild infection from umbilicus which resolved spontaneously with conservative treatment. The estimated infection rate was 9 % in our study. None of the patients had any incisional hernia postoperatively. **CONCLUSION:** Although Laparoscopy has largely superseded open surgery in diagnosis and treatment of acute appendicitis, open surgery with minimal invisible scar can still be undertaken at primary and secondary care level cost effectively with conventional open surgery instruments, by this novel technique in properly selected cases.

KEYWORDS: Appendectomy, Trans umbilical, Conventional

INTRODUCTION: Acute Appendicitis and its complications are the most common causes of pain in right iliac fossa of abdomen, in patients admitted to surgical wards. Inspired by a YouTube video hosted by Surgeons (SidhoHontako MDFinaa CS, Pelamoria Army Hospital, Makassar) from Indonesia, we, at our institution took up the novel approach to appendicectomy via trans umbilical route using conventional open surgery instruments. Nowadays, more often minimally invasive techniques like laparoscopy (first described by Semm in early 1980's) ¹ earlier using 3-port approach, later shifting to single site incision (SILS) are practised for appendicectomies, especially in children and adolescent age groups. Since Schreiber^[2] performed the first laparoscopic appendectomy in a patient with acute appendicitis in 1987, laparoscopic appendectomy has been included in practically all hospitals worldwide as the usual procedure in emergency departments.

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The use of single-incision surgery may represent an improvement over conventional laparoscopic surgery. With the number of incisions reduced to one umbilical incision, the potential advantages would be a better cosmetic outcome^[3-4].

The tendency towards reduced patient morbidity after surgery has enabled the development of techniques requiring an increasingly less invasive access to the operating field. Over the last decade, surgeons in a bid to be less invasive and provide greater comfort to patients, have developed means of access to the abdominal cavity with less surgical trauma such as natural-orifice transluminal endoscopic surgery and single-incision laparoscopic surgery^[5-7].

In recent years, more and more articles have been published demonstrating the feasibility of this SILS approach in different pathologies^[8-13], although the great majority does not include large series or randomized prospective studies. The use of single-incision laparoscopic surgery may represent an improvement over conventional laparoscopic surgery^[14].

The aim of this study was to evaluate the safety, feasibility and overall cosmetic outcome keeping in mind the cost effectiveness, when taken up in a primary or secondary care setting where advanced endoscopy equipment and expertise is not available.

PATIENTS AND METHODS: This was retrospective review of 40 patients mainly adolescent and in younger age group ranging from 15 years – 30 years. Of the 40 cases, 28 patients were females and remaining 12 were males. All patients were screened preoperatively for fitness of this procedure and informed consent taken.

All included patients with a diagnosis of appendicitis met the following criteria:

- History of abdominal pain localized in right lower quadrant, or per umbilical pain, later focused to right lower quadrant, associated with nausea and/or vomiting.
- Signs of peritoneal irritation and no h/o previous abdominal surgeries in the past.
- A thin built of patient preferably scaphoid shaped with less of subcutaneous fat and lax tone of abdominal wall (low Body Mass Index).

All patients in our study underwent an ultrasound scan to confirm the diagnosis of appendicitis and to rule out complicated forms of appendicitis.

The exclusion criteria were as follows:

- Patients with a history of cirrhosis or coagulation alterations.
- Patients with clinical or radiological suspicion of appendicular pathology complicated by an abscess and/or local or diffused peritonitis.
- Patients with septic shock.
- Pregnant patients.
- Patients unable to sign the informed consent form because of a mental disorder.

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TABLE I: AGE AND SEX DISTRIBUTION OF PATIENTS IN STUDY GROUP

AGE GROUP	MALES	%	FEMALES	%	TOTAL	%
15-20 YEARS	05	41.67%	11	39.29%	16	40.00%
21-25 YEARS	04	33.33%	09	32.14%	13	32.50%
26-30 YEARS	03	25.00%	08	28.57%	11	27.50%
TOTAL	12	30.00%	22	70.00%	---	100%

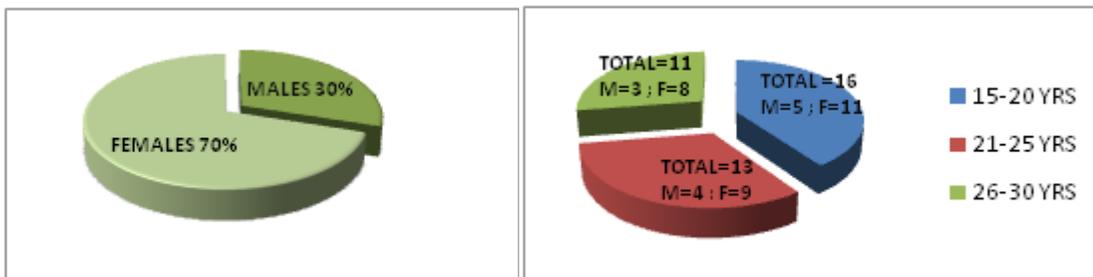


CHART I & II: DIAGRAM DEPICTING TOTAL NO. OF CASES (M+F) IN DIFFERENT AGE GROUPS.

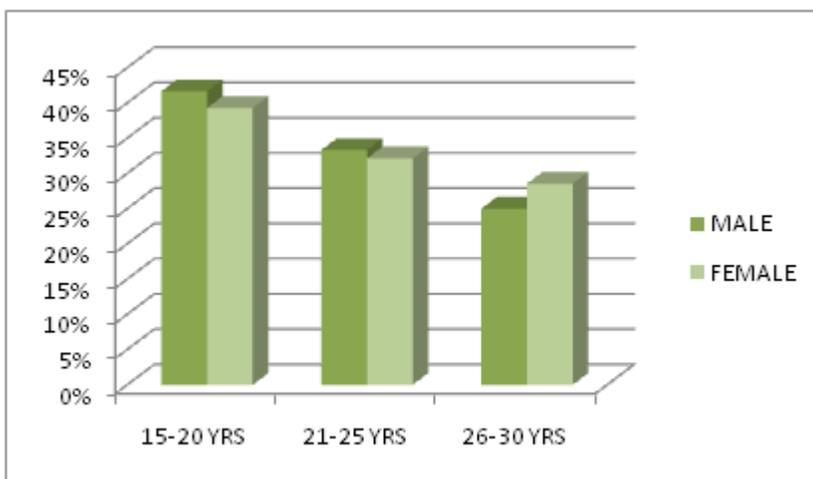


CHART III: BAR DIAGRAM SHOWING SEX WISE DISTRIBUTION OF CASES IN DIFFERENT AGE GROUPS

Preoperative Preparation: Once the decision was made regarding the surgical approach, the patients with appendicitis were administered the following medications, as treatment before surgery.

- Antibiotic prophylaxis with intravenous amoxicillin-clavulanic (2 g) 30 minutes before the operation; allergic patients were given intravenous metronidazole 500 mg and gentamicin 160 mg.
- Intravenous ranitidine (50 mg) 1 hour before the operation.
- Intravenous metoclopramide (10 mg) 1 hour before the operation.
- Before the skin incision, the umbilical area was washed thoroughly with povidone-iodine.

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PROCEDURE:

General Anaesthesia was administered to 12 of our patients who were adolescent and apprehensive. Rests of 28 patients in the study population were safely operated with good muscle relaxation under spinal anesthesia. A vertical incision was put through thinnest deeper part of umbilicus extending into lower half of umbilicus for a length ranging between 2cms and maximum of 3 cms in slightly obese individuals. Linea alba was split after dissecting subcutaneous fat and peritoneum entered and ends grasped with forceps. A slender long babcock's tissue holding forceps was passed towards the right iliac fossa (preferably the operating surgeon standing towards left side of the patient). The antecolic, pre ileal or post ileal or pelvic positioned appendix were easily grasped by the babcock's tissue forceps and gently brought out through the umbilical wound. As in formal open surgery transfixing ties are applied both for the mesoappendix and base of appendix and appendectomy done. Stump mucosa is coagulated, dry, and repositioned inside the abdomen. The incision is closed in 2 layers taking care to close the defect in linea alba with purse string suture and skin with Vicryl or Silk.

As no laparoscopy equipment was used in this operation, no energy source like fibreoptic halogen light/LED source was required.

RESULTS: Of the 40 cases selected for the study, the procedure was safely performed in 32 cases through trans umbilical route. In the remaining 8 cases, an additional right iliac fossa McBurney incision with muscle splitting in 5 patients and muscle cutting in 3 cases had to be done in view of dense adhesions to lateral abdominal wall, retrocaecal position of appendix, and fecolith dislodgement and auto appendectomy noticed intraoperatively in 2 cases.

The conversion rate in this procedure was 20 % due to intraoperative factors mentioned above, which can be regarded as fairly acceptable keeping in mind the cosmetic outcome if done successfully via trans umbilical route. (More studies are required with still more strict selection criteria that can definitely bring down the conversion rates in future).

In successfully operated cases, the mean operation time was comparable to traditional approach surgery (25 min v/s 20 min). The average postoperative hospital stay was 4 days in all cases. All patients were followed up for a period of 3- 6 months postoperatively. None of the patients reported incisional hernia.

6 of the successfully operated patients via trans umbilical route had minimal seroma/hematoma and mild infection and discharge from umbilicus was noticed in 3 patients which resolved spontaneously with conservative treatment. The umbilical invisible scars were cosmetically acceptable in all of these 32 patients. The infection rate of umbilical wound was 9.375% in our study series (as compared to 5 % in documented literature)

DISCUSSION: Surgeons are intrusive by nature. In recent years, the search for less morbidity and greater patient comfort has led surgeons to newer means of access to the abdominal cavity with less surgical trauma, such as natural-orifice transluminal endoscopic surgery and single-incision laparoscopic surgery.

Our study was solely done with intention of giving cost effective cosmetically acceptable scar to the poor patients coming to the government hospital, who cannot afford to have advanced endoscopic surgeries.

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As seen in this study, the trans umbilical single-incision approach is feasible and safe and there is no greater incidence of complications, than reported in previous prospective studies [16-19].

As far as operating time is concerned, most studies published [16-18, 20] reveal a longer operating time than conventional laparoscopy, somewhat similar to our series.

One of the theoretical advantages intended with the trans umbilical approach was greater comfort for patients and less pain. This might be achieved by reducing the size of the skin incision and not cutting the muscle. Other previous prospective studies show no differences [16, 18, 19, 22] or report greater postoperative pain, which requires higher doses of analgesics but prescribed for fewer days [17, 20].

One of the other intraoperative complications that may occur with the laparoscopic approach is damage to the epigastric vessels [23], and intestines or mesentery leading to an emergency situation and reoperation. This complication would be avoided with the umbilical approach.

The umbilicus, located in the thinnest part of the abdominal wall, can be closed under direct vision to avoid the possibilities of incisional hernia [24]. Infection of the surgical wound is an uncommon occurrence with this type of pathology. In two recent studies [17, 18] comparing the laparoscopic versus open surgery approaches, the rate of infection was approximately 5%. A recent study in 2011 by St Peter et al [20] reports a 3.3% surgical site infection rate in a series of 180 patients.

As for lengths of hospital stay, measured in postoperative days, we found no significant differences between the two groups (iliac fossa McBurney's approach and trans umbilical approach), although we did observe, as suggested in one study [25], that a fast-track protocol could be applied to appendectomies in patients with uncomplicated acute appendicitis without increasing the number of complications.

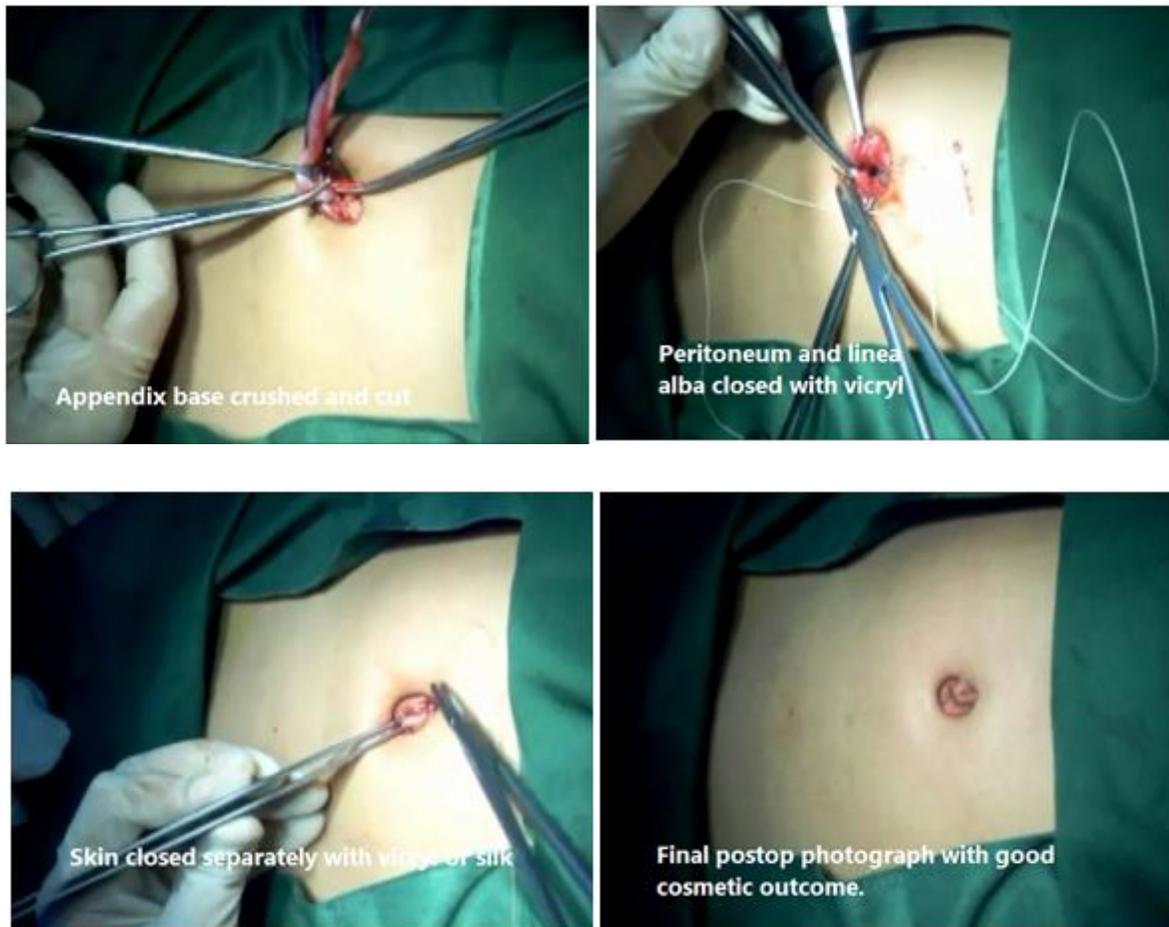
CONCLUSION: What can be achieved by single port laparoscopy was too much extent achieved by this hassle free, open visualisation method through umbilicus, which by virtue of normal scar gives a better cosmetic appeal. Like any procedure having its own merits and demerits, this procedure has its own limitations in operating on obese individuals, strong musculature, athletic build, inadequate relaxation and above all the defying positions of appendix itself with its own on-table surprises.

All patients have to be well informed about the feasibility and on table conversion if necessary to old standard approach and consent taken.

With these results and with the experience acquired, we also believe that this approach will motivate surgeons, the industry, and academic centers to explore the possibilities and perfect the technology [26]. As cosmesis is the order of the day, this novel approach can still be considered in properly selected cases in places, where cost is limiting factor and advanced endoscopy equipments are not available or when there exists a lack of laparoscopy trained personnel.

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