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Original Research Article

Comparative analysis of early exploration versus conservative approach for management of appendiceal mass

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ABSTRACT

Background: Acute appendicitis is the most common reason for emergency abdominal surgery. Acute appendicitis is ranging from mild inflammation of mucous membrane to gangrene, perforation and peritonitis. Appendicular mass is one of its early complication developing in 2 to 6 % cases of acute appendicitis within 48 hours of attack. Objective of this study was to evaluate the outcome of early surgical exploration and its complications in respect to conservative management followed by interval appendectomy for the management of appendicular mass.
Methods: A total 46 cases with clinical feature suggestive of appendicular mass presenting in MLN Medical college, Allahabad were included in study. All cases divided into two equal groups based on mode of management of appendicular mass. Group I (early exploration) and Group II (conservative followed by interval appendectomy).
Results: Result will be analysed in terms of hospital stay, morbidity, complications and cost.
Conclusions: Early exploration for appendicular mass had advantages of total curative treatment in the index admission, shorter hospital stay, minimal morbidity and ensures early return to work and higher compliance. Operative problems such as localization of appendix, adhesiolysis and bleeding are more pronounced and troublesome with interval appendectomy. Wound infection remains common postoperative complication of early appendectomy in appendicular mass but the rate of wound infection is not so high as to preclude this early operative approach.

Keywords: Appendicular mass, Morbidity, Perforation

INTRODUCTION

Acute appendicitis can be range from mild inflammation of mucous membrane to gangrene, perforation and peritonitis. It is most common acute conditions encountered in surgical practice requiring hospitalization.[1]

Most serious complication of appendicitis is rupture or perforation. Complications are more common at extremes of ages and in immunocompromised patients. Definite treatment of acute appendicitis is appendectomy to avoid complications.

Appendicular mass is a mass of inflamed appendix and oedematous caecal wall with adherent loops of oedematous terminal ileum wrapped with greater omentum. It occurs 48 hours after the onset of acute appendicitis.

It is due to the host resistance to contain the infection locally. Inflamed appendix gets circumscribed by fourth or fifth day and forms a mass. Mass increases in size up to tenth day and subsides usually by third week. Increases in size after ten days if an abscess has formed, which presents with classical features of acute appendicitis followed by a painful mass in the right iliac fossa.

General features of inflammation as pyrexia, malaise and tachycardia are present.

Differential diagnosis of appendicular mass is ileocaecal tuberculosis, carcinoma caecum, amoeboma, crohn's disease and external iliac lymphadenitis. Intussception in children and tuboovarian masses in females.[2]

As traditionally it was managed by conservative management approach i.e. Ochsner-Sherren regimen3, followed 6 to 8 weeks by interval appendectomy, as it was assumed that early exploration entails the risk of damaging the inflamed and friable bowel in the vicinity and will spread the infection to the peritoneal cavity.

Some 10 to 20 % of such patients fail to respond by conservative management and requires a delayed and potentially more difficult appendectomy with a possible laparotomy and bowel resection.

Moreover over 7 to 46% of patients suffer a recurrence of acute appendicitis or appendicular mass following discharge from the hospital, after successful conservative treatment of appendicular mass. This study was performed to compare early exploration of appendicular mass complications and benefits in respect to conservative management followed by interval appendectomy approach.

METHODS

This study was a Prospective study. It was carried out in the PG Department of Surgery, SRN Hospital, affiliated to MLN Medical College, Allahabad, after approval from the ethical committee and obtaining written and informed consent from the patients.

All the patients with more than 12 years of age and features suggestive of acute appendicitis, investigated and diagnosed to be having appendicular mass in absence of other obvious pathology were considered in the study.

A detailed clinical history of patient was taken including pain in abdomen (site, onset, migration, duration and severity), nausea, vomiting (duration, episodes, contents), fever (duration, grade, nature, associated with chills/ rigor) and anorexia. In case of female patient menstrual and obstetric history was also evaluated.

A detailed clinical examination was also done including general condition, pulse rate, respiratory rate, temperature, pallor, peristaltic movement, any obvious mass, hyperesthesia, abdominal tenderness (localized or diffuse), site, rebound tenderness, muscle guarding and rigidity.

To confirm the diagnosis of appendicular mass HRUSG abdomen was done. USG shows that as appendix has poor echo texture irregular and asymmetric contour and surrounded by large heteroechoic non-compressible mass of inflamed mesentery, omentum, caecum and terminal ileum.

Appendicular abscess was diagnosed as rounded/irregularly sonolucent structure containing small echogenic particles close to caecum. If USG abdomen was not conclusive than CECT abdomen with pelvis was done. Periappendiceal phlegmon appears as soft tissue high density mass while abscess are significantly lower in density.

In present study patient were randomly divided into two groups of 23 each. Group I include patient undergoing early exploration within 1 to 2 days of admission after presurgical workup and informed written consent.

All patients in group I were explored by lower midline. Operative procedure involved exploratory laparotomy with adhesiolysis with appendectomy or appendectomy with drainage or right hemicolectomy with iliocolic anastomosis

Group I include patient undergoing early exploration within 1 to 2 days of admission after presurgical workup and informed written consent. All patients in group I were explored by lower midline. Operative procedure involved exploratory laparotomy with adhesiolysis with appendectomy or appendectomy with drainage or right hemicolectomy with iliocolic anastomosis.

Group II includes patients initially kept on conservative treatment comprising hospitalization with Ochsner-Sherren regimen.

Progression of mass was observed, vitals recorded regularly to monitor response to conservative treatment. Patients were discharged after complete resolution of acute inflammatory mass and were followed up weekly in surgical OPD and were readmitted 6-8 weeks later for interval appendectomy.

Presurgical workup and informed written consent of the patient was done as in group I. Patients were explored by grid iron incision. Operative procedure involved simple appendectomy or right hemicolectomy with ileocolic anastomosis.

Predictor variables taken in both groups includes:

- Peroperative findings as simple mass, gangrenous/perforated appendix, loculated collection, appendicular abscess, adhesions.
- Peroperative difficulties as difficulty in localizing appendix, difficulty in adhesiolysis, minor trauma to bowel, bleeding.
- Total operative duration.
- Post-operative complications as wound sepsis, partial wound dehiscence, residual abscess, chest complications, adhesive intestinal obstruction and faecal fistula.

- Total duration of hospital stays which in group II includes stay during conservative management and also the stay during interval appendectomy while in group I includes there stay during initial management.

And these predictor variables were compared amongst two modes of management of appendicular mass and data was evaluated by SPSS version 17 and chi square and independent t test done to carry out result among these two groups.

RESULTS

Total 46 consecutive patients fulfilling inclusion and exclusion criterion with confirmed diagnosis of appendicular mass were considered in this study. Benefits will be analysed in terms of hospital stay, morbidity, complications and hospital cost.

Table 1: Baseline preoperative characteristics.

Characteristics	No. of patients	%
Age group (in years)		
12-20	10	21.74
21-30	19	41.3
31-40	7	15.21
41-50	4	8.7
>50	6	13.04
Sex		
Male	31	67.39
Female	15	32.61
Site of pain		
Periumblical	32	69.6
Epigastric	4	8.7
Right lower abdomen	3	6.5
Generalized abdominal pain	7	15
Confirmation of diagnosis of appendicular mass		
Ultrasound	32	69.56
Contrast enhanced CT Scan	2	4.3
Suspicious mass confirmed preoperatively	12	26

Among total 46 patients 82.9% i.e. 38 presents with complain of nausea and vomiting along with pain. 6 patients in present study presented with complain of mass per abdomen. 36 (78.8%) patients in present study complained of reduced oral intake to nearly half and felt generalized malaise. 33 (71.2%) patients presented with history of fever which was low grade intermittent and relieved by analgesics and cold sponging. In the present study 86.95%of the total patients presented with tachycardia (P.R.>110) i.e. 40 out of 46 patients.

Among 46 patients in present study 42 patients (91.3%) patients presented with abdominal tenderness in which 34 patients (74%) presented with tenderness localized to right iliac fossa and tender mass on palpation. Among which 26 had rebound tenderness and 28 had tender mass also and 8 patients (17.3%) presented with diffuse abdominal tenderness, tender mass and rebound tenderness.

Table 2: Intraoperative characteristics.

Procedures	Early exploration	Conservative followed by interval appendectomy
Operations performed for appendicular mass		
Simple appendectomy	16 (69.5%)	20 (87%)
Appendectomy with drainage	4 (15.3 %)	0 (0%)
Rt. Hemicolectomy with Iliocolic Anastomosis	3 (13.0%)	3 (13%)
Peroperative findings		
Simple Mass	11 (47.82%)	3 (13%)
Gangrenous/ Perforated Appendix	4 (17.4%)	0
Loculated collection	1 (4.4%)	0
Appendicular abscess	3 (13%)	0
Firm adhesions	4 (17.4%)	17 (74%)
Operative problems		
Difficulty in localizing appendix	5 (21.7%)	12 (52.17%)
Difficulty in adhesiolysis	6 (26%)	16 (69.56%)
Minor Trauma to Bowel	3 (13%)	1 (4.34%)
Bleeding	3 (13%)	6 (26.08%)
Total operative time		
60-90 min.	13 (56.5%)	4 (17.4%)
90-120 min.	8 (34.8%)	15 (65%)
>120 min.	2 (8.7%)	4 (17.4%)

Leucocytosis >11,000 was present in 40(87%) of the total patients. On X-ray whole abdomen AP erect view 4 (8.7%) patients presented with pneumoperitoneum.

After confirming the diagnosis of appendicular mass patients were randomly divided into 2 groups of 23 each.

Group I was managed by early exploration within 1 to 2 days of admission after proper pre-surgical workup while group II was initially hospitalized kept on conservative

management i.e. with ochsner- Sherren's regimen up to the resolution of acute inflammatory mass and discharged. Thereafter and was followed regularly in surgery OPD and was readmitted after 6-8 weeks with the plan of interval appendectomy.

Table 3: Postoperative variables.

Post-operative complications		
Complications	**Early exploration**	**Conservative followed by interval appendectomy**
Wound sepsis	3 (13%)	4 (17.39%)
Partial wound dehiscence	2 (8.69%)	3 (13%)
Residual abscess	0	3 (13%)
Chest complications	2 (8.69%)	1 (4.34%)
Adhesive intestinal obstruction	0	5 (2.2%)
Fecal Fistula	0	0
No complications	69.62%	50.07 %
Total hospital stays		
Duration	**Early exploration**	**Conservative followed by Interval appendectomy**
<7 days	1 (4.34%)	0
8-14 days	16 (69.56%)	5 (21.73%)
15-21 days	5 (21.73%)	11 (47.82%)
21-28 days	1 (4.34%)	4 (17.4%)
>4 weeks	0	3 (13%)

DISCUSSION

Appendicular mass is a common surgical entity encountered in 2 to 6% of patients presenting with diagnosis of acute appendicitis1. It forms a spectrum of disease ranging from an inflamed appendix walled off by omentum (an appendicular phlegmon) to a large collection of pus surrounded by adherent and inflamed omentum that is appendicular abscess.

As the management of appendicular mass is controversial, we have performed present study to compare early exploration of appendicular mass in contrast to conservative management followed by interval appendectomy approach.

Traditionally it was believed that surgery during the phase of acute appendicitis with a mass was potentially dangerous and could lead to life threatening complications because of edema and the fragility of important structures like the terminal ileum and caecum. Failure of the conservative regime was reported in 2-3% and urgent exploration was considered essential.

Operative problems such as localization of appendix, adhesiolysis and bleeding are more pronounced and troublesome with interval appendectomy as shown in findings of present study.

Conservative management approach was considered to be associated with a substantially low rate of complications (Tingstedt B) and was safe (Kumar S and Jain S).[3,4] Rate of success was reported to range between 88-95% (Safir Ullah 2007).[5] Interval appendectomy was considered essential believing that the rate of recurrence of appendicitis and mass formation is high after conservative treatment and resolution of the mass.[6] Another reason for an interval appendectomy was the confirmation of the diagnosis as it is possible to miss other pathology like ileocaecal tuberculosis or malignancy. These conditions mimic acute appendicitis and conservative therapy alone should be considered cautiously.[7]

In present study on comparing early exploration with conventional management we found a easily lysable simple mass with less dense adhesions with lower rate of difficulty in localizing appendix and adhesiolysis, less operative duration and reduced hospital stay with reduced hospital cost in early exploration group in contrast to dense adhesions, difficulty in localizing appendix and adhesiolysis with similar rates of wound sepsis, bleeding, trauma to bowel, chest complications with significant adhesive intestinal obstruction and residual abcess as a complication. Poor compliance and inceased loss to follow up along with increased hospital stay present in conservative followed by interval appendectomy group.

So in comparision of early exploration with conservative followed by interval appendectomy we found early exploration for appendicular mass a more effective and feasible mode of management of appendicular mass and the results are consistent with a number of similar studies as Malik Arshad et al, De u Ghosh S et al, Samuel M et al, claiming early appendectomy to be a more appropriate and effective way of managing appendicular mass.[8-10]

It was also reported that about 10% of patients need exploration due to deterioration on a conservative regimen.[11]

Key to early surgery is good resuscitation, expert anesthesia, broad spectrum antibiotics and an experienced surgeon.[9] This approach obviates the need of re-admission, cures the problem totally and there is an opportunity to reach to a conclusive diagnosis at an early stage.

An early exploratory approach for appendicular mass was reported by Vakili in 34 patients who underwent surgery within 32 hours of admission, Marya et al, compared conservative treatment in 26 patients to operative treatment in 30 patients. Arshad Malik et al performed a study aimed to determine the feasibility and safety of an early appendectomy in 176 patients.[8,12,13]

In study by Sardar Ali et al there was 13.33% wound infection in early appendectomy group in comparison to 16.66% in interval appendectomy group and 20% patients in interval appendectomy group developed adhesive intestinal obstruction similar to present study.[14] In contrast to present study a study by JM Aranda-Narváez et al, there was 40% incidence of surgical site infection in immediate appendectomy group in contrast to 0% in interval appendectomy group.[15]

Longer duration of surgery and more hospital stays in conservative followed by interval appendectomy group in present study as well as Malik Arshad et al study.[8]

CONCLUSION

Early exploration for appendicular mass is more effective and feasible mode of management. Advantages of early appendectomy include total curative treatment in the index admission, shorter hospital stay, minimal morbidity and ensures early return to work and higher compliance. Earlier belief that surgery is difficult in such a state where the inflamed appendix is buried deeply in the mass and the bowel loops are friable is no more a valid argument at present due to a global improvement in anaesthesia, supportive care and antibiotics.

Operative problems such as localization of appendix, adhesiolysis and bleeding are more pronounced and troublesome with interval appendectomy. Wound infection remains common postoperative complication of early appendectomy in appendicular mass but the rate of wound infection is not so high as to preclude this early operative approach.

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