

Original Article

Appendicular Lump : Revisiting with New Challenge

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Background : Acute appendicitis is still probably the commonest cause of acute abdomen ,needing surgical intervention. But in case of prolongation of inflammation, appendicular lump may form in 2-6% cases. The traditional treatment of appendicular lump is conservative followed by delayed appendectomy. Another option is early intervention before the lump becomes well circumscribed when disturbing the anatomy is risky.

We performed an institution based observational study over all those patients clinically diagnosed with appendicular lump presented in indoor or outpatient Department of General Surgery in Medical College, Kolkata during a period of one and half year. We formulated a protocol strictly based on detailed history and meticulous clinical examination and sonology of abdomen and chose appropriate option of either early intervention or Ochsner-Sherren regime and followed up them for next 6 months.

Total 31 patients were taken into the study after exercising necessary exclusion and out of them, 21 patients could be successfully treated with immediate operation. No primary colonic resection was required and neither, there was any case of post-operative faecal fistula and incisional hernia. Of those patients, treated conservatively, 6 patients eventually underwent interval appendectomy.

Conclusions : With the use of good clinical acumen, sound knowledge of surgical anatomy and judicious help of imaging, early exploration in appendicular lump is hazardless, confirms the diagnosis, minimises the duration of hospital stay avoiding any chance of readmission and further expenses.

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Key words : Appendicular lump, Ochsner-Sherren regime, early intervention.

Acute appendicitis is probably the most frequent acute surgical pathology and emergency appendectomy is the best available treatment of it. But if not duly attended, the ongoing inflammation may sometimes be contained by the patient's own defence mechanisms and an inflammatory mass or an appendicular lump may result, as in 2-6% cases¹. Immediate surgery is often hazardous thanks to the distorted anatomy, problems in closing the appendiceal stump because of gross oedema and risk of injuries to intestines. Any operative endeavour could end up with colonic resections, ie, ileocectomy or right hemicolectomy or faecal fistula post operatively^{2,3}.

Conservative management, namely Ochsner-Sherren (OS) regime with interval appendectomy has conventionally been the most popular choice. But this protocol has recently been challenged as the risk of recurrence is negligible^{4,5}.

Moreover, the evil of conservative management is

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Editor's Comment :

- Although traditional treatment of appendicular lump is conservative followed by delayed appendectomy, earliest intervention is the recent trend.
- If selected with proper clinical judgement and imaging support, early exploration is safe, and cost effective.

its failure, which may be observed in 10-20% of the cases when it demands more risky or demanding emergency surgery which carries more morbidity and mortality⁶. Another disadvantage is the obscurity related to other possibilities like malignancy of caecum, neoplasm or appendix, ileo-ileal intussusception and last but not the least, ileo-cecal tuberculosis, which may be spuriously misdiagnosed as appendicular lump, whose true diagnosis may be delayed⁷⁻⁹.

It is high time to move on from the traditional conservative management to immediate intervention, which allows clinician to diagnose the disease and then to cure which in turn effectively shortens hospital stay, obviating any further need of admission^{1,7,10}.

The present study was conducted with the objective to observe the course of appendicular lump with reference to its variant treatment modalities i.e. early intervention and conservative management in terms of overall outcome.

MATERIAL AND METHOD

It was an institution based prospective observational study performed in the indoor and outpatient Department of General Surgery in Medical College, Kolkata. Each patient was required to give written informed consent prior to enrolment in the study and a prior clearance was taken as per the institute's ethical committee guidelines. A detailed history and a thorough physical examination during indoor admission and regular follow up and correspondence after the discharge of each patient formed the basis of the study. After making an appropriate clinical diagnosis, one or more of the special investigations – Ultra sound in this case was carried out for the confirmation of the diagnosis.

The idea of deciding early intervention in a patient with clinically palpable lump in right lower quadrant (RLQ) of abdomen is critical. Understanding the pathogenesis of appendicitis is utmost important.

Luminal obstruction of the appendix is probably the final common pathway towards evolvement of appendiceal gangrene and perforation. Although initially, the lumen remains patent despite mucosal inflammation and lymphoid hyperplasia, with uninterrupted mucus secretion and inflammatory exudation, the blockage becomes imminent. Increased intraluminal pressure further affected lymphatic drainage, causing further edema and mucosal necrosis favouring bacterial translocation to the submucosa. Sometimes spontaneously or in response to any medical intervention with antibiotics, resolution may be achieved at this point. But if the condition is allowed to remain unchallenged and un-intervened, soon venous obstruction, then arterial obstruction and finally gangrenous changes in the appendix wall with generalized bacterial contamination of the peritoneal cavity may follow^{11,12}.

Even at this stage, possibilities are varied depending upon individual case, age, the immune status of the patient and the virulence of the organism. More commonly, greater omentum and small bowel loops rush to wrap and segregate the inflamed appendix, limiting the spread of peritoneal contamination and resulting in a phlegmonous mass or para-caecal abscess^{8,13}.

But the greatest threat is generalized peritonitis which results from an unchallenged frank perforation of a gangrenous appendix or dissemination from an otherwise localized appendicular abscess facilitated by aggravating factors like extremes of age, immunocompromise, diabetes mellitus and a free-lying pelvic appendix and previous abdominal surgery that limits

the mobility of the greater omentum.

Rarely, a mucus filled distended organ termed as mucocele of appendix can be a sequel even after the inflammation of appendix subsides completely.

Despite numerous advancement in imaging modalities, the diagnosis of appendicitis is still clinic based and there are typical signs and symptoms, pain abdomen, nausea, vomiting, tender right iliac fossa and others which give an suspicion of appendicitis. Now, conventionally, in any patient with right iliac fossa lump with prior symptoms suggestive of acute appendicitis, the next plan of treatment mostly sways towards conservative approach which is traditional and its success is well established.

But, we often use the term appendicular lump loosely and stamp its diagnosis in the mere presence of lump in RLQ, irrespective of its duration and variety of clinical presentation. Even any lump of appendicular origin has different implications. It could be mere conglomeration of gut (often spuriously interpreted as lump by sonography) or it could be an appendicular phlegmon (inflamed yet viable viscera just coming together to contain the inflammation) or an early lump (when components are adhered but not inseparable) and finally, it may be an well circumscribed classical appendicular lump and last but not the least, an appendicular abscess¹⁴.

Now if we go further deep, and consider all emerging symptoms and accompanying signs and underlying pathogenesis, we find there is an distinct correlation between different pathogenetic stages and their sequelae and the emerging symptoms and signs with their changing variation and severity. We believed and also past researchers vindicated that if we select those early cases, where lumps are palpable but not hard, tender, margins are irregular (reflecting that the inflammatory process is yet to be contained) a decision of intervention can be taken judiciously with good successful outcome. On the contrary, any attempt to disturb an already contained inflammation as reflected in an well circumscribed, nontender lump presenting after that golden period is likely to be hazardous.

Exclusion criteria for the study :

- diabetics
- immunocompromised
- lump with history of onset of pain > 10 days
- lump with strong suspicion of malignancy.

All interventions were done by experienced surgeons and all surgical specimens (including appendix, suspicious mesenteric lymph nodes and greater omentum) were examined by senior pathologist.

OBSERVATIONS

Out of 31 patients, 10 are managed conservatively while 21 were operated. This is not statistically significant difference in the mean age of the patients in either treatment modalities.

Pain was obviously the predominant symptoms; all patients had RLQ pain when attended or in the history, signifying RLQ pain to be most consistently presenting symptom.

The average duration of pain in conservatively managed patients was 7.8 days at the time of presentation whereas in operated patient it was 4.2 days: which is statistically significant (Fig 1/ Table 1).

There was no statistically significant difference in gender distribution in both management. Overall female: male is 3: 2. 60% of conservatively managed patients had history of anorexia whereas 85% of operated patients had history of same. Overall 77.4% patients had history of anorexia. More operated patients (81%) had complaints of nausea and vomiting than conservatively treated patients.

70% of conservatively treated patient had history of fever whereas only 38.1 % of operated patients had history of same. But this is statistically not significant.

30% of conservative patients had increased pulse rate whereas 90% of operated patients had the same. Overall 58% of patients had increased neutrophil count (40% of conservative and 66.7% of operative).

Now, in regards to the clinical appreciation of lump in RIF, overall 64.5% had firm lump, but there were other factors which dictated the decision of intervention and hence the outcome.

95% of those underwent surgery had lumps with irregular border whereas only 10% of lump with regular border was operated (Fig 2).

Overall USG done within 2-3 days of admission could diagnose a lump in 64% of patients. Of them, in conservative arm, USG detected lump in 100% cases.

Intraoperatively, in most cases, there were either grossly inflamed appendix or appendicular phlegmon (66.7%)(as shown in Fig 3) whereas 23.8% cases had suppurative appendix and 9.9% had gangrenous appendix (Fig 4). Histopathologically, all appendicular specimen revealed inflammatory aetiology, mesenteric lymph nodes and bits of greater omentum as collected showed reactive changes with no sign of any suspicious aetiology which demands further investigation.

Only 20% of conservatively managed patients were discharged within 7 days while rest 80% required more than 7 days (up to 14 days) . On the same page 85.7%

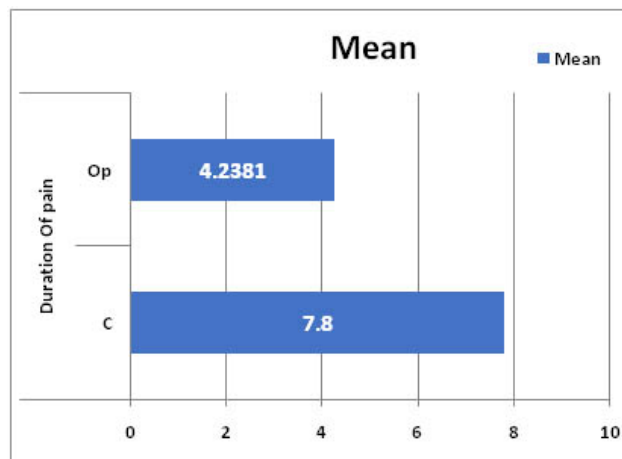


Fig1 — Mean Duration of pain : management

| | Number | Mean | SD | Minimum | Maximum | Median | p-Value |
|--------------------|--------|--------|--------|---------|---------|--------|---------|
| Duration of pain C | 10 | 7.8000 | 1.3166 | 6.0000 | 10.0000 | 7.5000 | <0.0001 |
| Op | 21 | 4.2381 | 1.3381 | 2.0000 | 7.0000 | 4.0000 | |

of operated patients were discharged within 7 days.

Mean duration of hospital stay in conservative group were 8.7 days while in operative group it was 5.8 days which had statistical significance. This implies that the course of resolution of disease process took longer time in conservatively managed patients.

Operated patients had mild complications like wound complications, chest complications, whereas conservatively managed patients had complications of residual abscess, chest complications etc.

No patient in our study developed neither faecal fistula nor incisional hernia.

23.8% of operated cases had wound complications which is managed with regular dressing and antibiotics. 30% of conservative patients had residual abscess whereas there was no residual abscess in operated

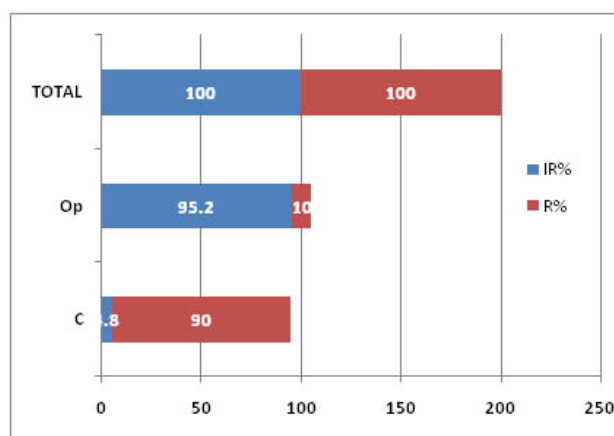


Fig 2 — IR (Irregular margin) % & R(regular margin) % Association of borders



Fig 3 — Showing appendicular phlegmon

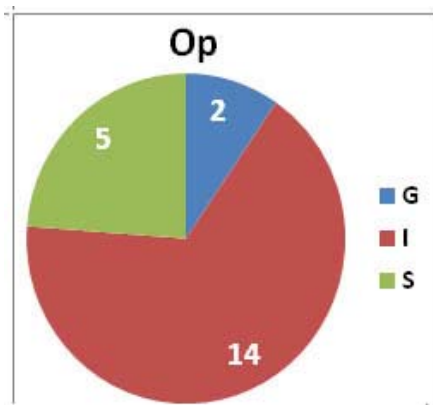


Fig 4 — Association of operative finding : management

whereas only 14.3% of patients had chest complications in the surgical arm.

7 out of 10 conservatively managed patients could be followed up as 3 were lost after first revisit. Interestingly, 5 patients came with recurrent symptoms of appendicitis. Eventually, 6 patients underwent interval appendectomy and one patient didn't opt for appendectomy since that person was clinically symptom free.

DISCUSSION

Palpable lump in right lower quadrant of abdomen has varied implications. Prior history suggestive of appendicitis invariably substantiate the diagnosis of lump of appendicular aetiology where conservative management followed by appendectomy after 6 weeks or so is the golden rule of management. Immediate surgery was said to be more risky and non-operative option was favoured because of high success rate.

But the significance of OS regime has been lately paled into insignificance due to varied reasons. One is its failure that complicates the scenario and next is the ambiguity associated with differential diagnosis. The possibilities of different pathology in the form of malignancy, ilio-caecal TB and lympho proliferative disorders cannot be ignored. An apparently successful nonsurgical treatment of the lump may even delay the underlying diagnosis of cancer or Crohn's disease (CD) where role of imaging like CECT is often equivocal^{15,16}.

More decisively, many researchers opined that there is hardly any need for interval appendectomy as the vast majority (95%) of patients managed conservatively is unlikely to develop a recurrence^{6,17}. Secondly, the idea behind confirming the diagnosis of

appendicular origin during interval appendectomy or identifying alternative diagnosis like that of malignancy becomes irrelevant as the consequence of delay in diagnosis of any intra-abdominal malignant pathology could be sinister. The proponents of early surgery emphasizes on the added benefit of immediate diagnosis of serious diseases masquerading as an appendicular mass while leaving nothing uncertain for the future¹⁸.

Now it is observed, that even in the background of inflammatory pathology, the decision and its success with little

or no complication lies in the consideration of different stages of it and varying degree of fibroblast deposition and degree of protective containment. The guidance of imaging (USG/CT scan) which often spurious or misleading, should be taken with a pinch of salt . So clinical judgement is again superior than the rest.

If patient is examined with proper technique after fulfilling all general pertinent pre requisites (like pre-counselling, relaxing the patient satisfactorily, palpation starting from a quadrant radially opposite to the area of inflammation) which are often ignored, those clinical variants can be well appreciated. In a normal, immuno-competent patient, lump usually begin to form after 48 to 72 hours. Initially, the tenderness is most at or around McBurney's point but it is also felt in left iliac fossa (Rovsing's sign may be +ve),an very ill defined, irregular lump like feeling may be there which no way gives an idea of its shape. This is either appendicular phlegmon or early lump which is mostly seen during 3-5 days of onset of pain. The adhesion at this period is very much separable when the process of fibrosis hardly sets in. During this golden period (Table 2) if patient is operated by surgeon with good surgical experience and expertise, techniques adhering to surgical principle of good tissue respect, necessary finger dissection, avoidance of sharp, traumatic instruments—all these can ensure successful outcome. But on further progression of time, the phlegmon/early lump soon become well circumscribed, well defined, taking round or piriform shape ,the fibroblast deposition becomes maximum, adhesions turns more organized when intervention is likely to be beset with high risks.

Appendicular lump is most commonly found in the age group of 21-30 years (C Pandey, R Kesharwani *et al*)¹⁹. In our study the mean age in conservatively treated patients were 34.5 years whereas in operated

Table 2 — The golden time zone for intervention

| Days from onset | Symptoms | | Clinical findings | | | | | | |
|-----------------|-------------|-------------------------------------|-------------------|---------------------|--------------|-------------|------------|------------------|--------------------------|
| | Pain in RIF | Systemic (appetite/nausea/Vomiting) | Tender RIF | Muscle guard in RIF | Rovsing sign | tender-ness | Shape/size | consistency | Margin/regularity |
| 2-3 | +++ | +++ | ++ | + / ++ | +ve | +++ | No lump | — | — |
| 3-4 | + | + / ++ | + | + | -ve / +ve | + | - / oblong | Soft/ill defined | Vague/irregular |
| 4-5 | + | - | - / + | - | -ve | - / + | globular | Firm to hard | More defined and regular |
| 5-8 | - | - | - / + | - | -ve | - / + | globular | Hard | Well circumscribed |

The best period to intervene
 Period, when intervention can be done with proper precaution

of appendicular aetiology and reviewing the literature yielded similar findings (C Pandey *et al*)¹⁹.

Overall, 71% of patients had pulse rate more than 90 per minute at the time of presentation. 90.5% of operated patients had increased pulse rate while only 30% of the conservatively managed patients had

patients were 26.3 years. Overall mean age was 29 years which is similar to the other study. The mean duration of pain of conservatively treated patients were 7.8 days where as it was 4.2 days in operated patients till operated. In the literature average duration pain was found to be approximately 4 days which was concurrent to this study¹⁹. Early presentation influenced in a way towards decision for intervention.

Mean duration of hospitalization was 8.7 days in conservatively treated patients and in operated patients it was 5.8 days which was statistically significant and it shows that patients with surgical modality of treatment had a shorter course of resolution of symptoms and recovery. Other established studies showed similar outcome (V K Agarwal *et al*)²⁰. And slightly higher than another study

In our study we found there was female preponderance though not statistically significant with female : male ratio of 3:2. Reviewing the existing literature one study showed F:M ratio of 1.9:1 (C Pandey *et al*)¹⁹ whereas another showed almost equal distribution in both sexes (R S Bhandari *et al*)¹⁸. Probably it varies from region to region, dietary habits, lifestyles.

In our study all patients, at some stage of their disease progression, presented with pain in the right lower quadrant. This is also in line with other studies¹⁹.

70% of our conservatively treated patients had history of fever whereas only 38.1% in the surgical arm had febrile episodes. Overall 48% patients had fever as complaint. Available studies show this to be in line with their findings (C Pandey *et al*)¹⁹.

85.7% of operated patients had anorexia where as 60% of conservatively treated patients had the same. Overall 77.4% of patients had anorexia. Anorexia, apart from other systemic complaint like nausea, vomiting is one the specific sign guiding towards the diagnosis

the same. It was statistically significant. The logic is obvious as the lump localises and inflammation subsides, tachycardia associated with it also decreases.

51.6% of all patients had TLC > 12000. this finding is also corroborated by Pratik H Vyas *et al*. 40% of conservatively treated patients had increased leukocyte count at admission, whereas 57.1% operated patients had the same. Quite similarly, 66.7% operated patients had neutrophilia with shift to left whereas conservative group had 40% patients with same. Over all 58.1% had neutrophilia with shift to left. Shift to left has been among one of the most defining criteria in diagnosis of appendicitis but correlation with appendicular lump doesn't translate with same sensitivity. It may be due to the fact that when appendicular lump forms, infection is more on the controlled side.

USG is the most commonly prescribed initial imaging for suspected appendicular pathology and various studies reflected its sensitivity to be approximately 90% with appendicitis or appendicular lump. In our experience, it detected a lump 64.5% of times, where USG detected lump in all conservatively treated pts but for operative group the yield fell short, only 47.6%.

Consistency of the lump goes a long way in deciding which cases to operate but was not the only deciding factor. We found 20 patients with firm lump all of which could be operated, whereas only 1 out of 11 cases with hard lump where we successfully ventured, thanks to other favourable factors.

Borders or margins were also influential deciding criteria. 95.2% cases with irregular margins could be operated. But only 1 out of 10 cases with regular borders could be operated. Regular margin signifies localisation of infection with well-formed lump.

In all patients with lumps of varying consistency,

borders and other dictating factors, appendix, when intervened, invariably showed variable stages like appendicular phlegmon, or appendicular abscess or gangrenous change depending upon the course of the particular case. In present study we found inflamed appendix 66.7% of operated cases, suppurative cases 23.8% cases, and gangrenous changes 9.5% cases. This was similar to what B Patel *et al* found in their study²¹.

CONCLUSION

In the light of present study, we realized that both treatment options of appendicular lump as its own weightage. The clinician and operative surgeon must exercise good and sincere clinical acumen and take help of investigation judiciously before choosing appropriate methods in each individual case. More prospective randomized controlled trials are in demand for comparing the outcomes of different treatment options of appendicular lump, so to identify which method is superior, cost-effective and more importantly hassle free.

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