

## Review Article

# Simple versus complicated appendicitis

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### ABSTRACT

Aim of this study is to understand appendicitis in its various presentations. We encounter patients in different stages of the disease. One end of the spectrum is presenting with simple acute appendicitis while other extreme is represented by serious cases of perforated appendicitis. In between cases with various stages of complications could be seen. Simple appendicitis progresses towards complicated one in its natural course. Rise in intraluminal pressure leads to gangrenous perforation. Expertise of the treating surgeon lies in timely detection and intervention. Desired and favorable results are possible to achieve with judicious use of gastrointestinal surgical techniques by the expert. Present study reviews the literature, different research papers and studies available. My own clinical experience in the understanding of appendicitis and its management has enabled me to shape up the article.

**Keywords:** Perforated appendicitis, Appendectomy, Surgical exploration, Intestinal obstruction, Colonic mucous fistula

### INTRODUCTION

Appendicitis is an inflammatory process due to infection. Appendicolith obstruction is the common etiological factor. Rise in intraluminal pressure due to pus collection leads to ischemic necrosis leading to perforation in appendix. Spillage of pus can lead to localized or generalized peritonitis. Pus could be walled off locally which results in peri-appendicular abscess.<sup>1,2</sup>

Simple cases lead to inflammatory effusion locally. Subsequently it is infected due to transluminal migration of bacteria. Nature tries to contain the sepsis. Omentum and loops of ileum adhere to the inflamed appendix leading to formation of phlegmon.<sup>2,3</sup>

Peri-appendicular abscess results early in perforated cases. Generalized peritonitis, spread of sepsis to portal system, liver abscess and septicemia is encountered in immunocompromised individuals.<sup>6,7,9</sup>

Appendicitis is one of the commonest surgical emergencies. Doctors giving G. P. services must be aware of various presentations of the disease. Their training must include to diagnose and start the initial treatment. Carefully selected antibiotics given early do help to check the morbidity and minimize postoperative complications.<sup>1</sup>

Use of laxatives and enemas are contraindicated in patients presenting with constipation. Timely referral to a surgical specialist will help to offer early surgical treatment. It will lead to better prognosis and lesser rate of complication.<sup>1,5</sup>

### REVIEW OF LITERATURE

We reviewed the literature using various search engines such as Google Scholar, PubMed, Scopus, Various journals and surgical books. Following studies were found quite helpful in shaping up the article.

Simillis et al conducted their met-analysis to compare conservative treatment versus acute appendectomy for complicated cases.<sup>3</sup> Saar et al in their article enlightens on perioperative morbidity in delayed surgery.<sup>6</sup> Omari et al reviewed acute appendicitis in elderly relating with the risk factors leading to perforation.<sup>9</sup> Anderson and Petzold in their published article in *Am surgery* in 2007 focused on non-surgical policy to tackle with appendiceal abscess or phlegmon.<sup>2</sup> Young et al elaborated well regarding outcome of complicated cases of appendicitis in their article.<sup>5</sup> Drake et al analyzed how to time surgery to avoid complications.<sup>8</sup> Salminen et al compared antibiotic treatment versus surgery in acute appendicitis.<sup>1</sup> Barrelo et al discussed the risk factors to guide decision making in surgery.<sup>7</sup> Perez et al revealed the philosophy regarding interval appendectomy in complicated cases.<sup>10</sup> Helling et al in their article published emphasized on decision making regarding operative versus non operative policy in complicated cases.<sup>4</sup>

## DISCUSSION

Thorough initial assessment of complicated cases is important to decide the further course of management. Consideration of their general condition, systemic involvement, nutritional status and co-morbidities are important. A battery of investigations is required to assess them thoroughly.<sup>7-9</sup> Close observation is equally important to take decision for timely surgical intervention.<sup>6,7</sup> Extra vigilance is required in two extremes of ages.<sup>9</sup>

Simple uncomplicated cases are managed easily.<sup>1</sup> Shorter hospital stay of 1.8 days as against 5.2 days in complicated cases is required. Perforated cases do have complication rate as high as 59% against 3% only in simple cases. Mortality rate is higher up to the tune of 12% in complicated cases while it is negligible in simple cases.<sup>8</sup>

Perforation can take place as early as 48-72 hours. Patients recovering on conservative treatment may perforate. Even cases with sealed off perforation can give way. Surgical intervention is necessary in such situations.<sup>8</sup>

Complicated perforated cases may present with intestinal obstruction. It could be due to septic ileus or adhesions. They are offered medical treatment initially. Surgical intervention if required in selected cases.<sup>4,5</sup>

Patients presenting late with phlegmon and perforations with lump are initially kept on conservative treatment.<sup>2</sup> Close monitoring is needed to assess the response. Surgical intervention is warranted in case of deterioration.<sup>3-5</sup>

Up to 90% cases presenting with lump may recover on conservative management.<sup>3,4</sup> Non-responders are subjected to imaging like CT/MRI. Peri-appendicular

abscess if present is aspirated under image guidance.<sup>2</sup> Failed aspiration and patients with symptoms like spikes of fever will invite surgical intervention. Appendectomy with surgical toilet is attempted. Unscrupulous handling of bowel in an attempt to approach appendix should be avoided.<sup>4</sup> Overjealous attempts can lead to fecal fistula. So, one should be contented with putting drains and close. Appendectomy with friable caecum invites cecectomy or some time limited hemicolectomy.<sup>7</sup>

Haemo-dynamically unstable cases require extra precaution and expertise. They are subjected to emergency surgery after initial resuscitation. Appendectomy with closure of freshened cecal perforation is performed. Proximal ileal loop is delivered through separate incision. Completion of ileostomy may defer for 48 hours. Once patient is stable one can complete the stoma formation. Quick single layer closure of abdomen is warranted in such cases to save surgical time.

## Guidelines

Early diagnosis of acute appendicitis and treating it with carefully selected antibiotics is important. In case it does not work emergency, appendectomy is advised. Delay in judicious management leads to appendicular lump formation. Medical management is advised in such situations. It helps to resolve nearly 90% cases. Interval appendectomy is advised as per the old dictum after 8-12 weeks. Further investigations are required in rest of the cases. Blood counts, CRP, CT/MRI are advised. In case of localized abscess CT guided aspiration is advised. We adopt surgical management in cases of no abscess or failed aspiration. Surgical management is advised in case of perforation in resolving cases of appendicular lump or leak in walled off cases due to low immunity. Cases with septic ileus and adhesive obstructions are taken for surgery in case medical management fails.

Associated cecal perforation complicates the issue further. We recommend ileal loop diversion with cecal repair in all our cases. Friable caecum needs cecectomy or even limited hemicolectomy. Primary ileocecal anastomosis is discouraged. We adopted temporary terminal ileostomy with distal colonic mucous fistula formation. Two ends are united once patient recovers in 8-12 weeks' time.

In case of retrocecal appendicitis we can encounter cellulitis of posterior abdominal wall leading to even abscess formation in complicated cases. Here we approach the abscess through posterior wall. Interval appendectomy if required in the future is done through the usual route.

## CONCLUSION

Early diagnosis and adequate antibacterial management in acute appendicitis is advised to minimize incidence of

appendectomy as low as in 10% cases. Remaining patients are followed for long term period of 6-12 months. Around 5% of them recur with symptoms and subjected to acute appendectomy. Around 90% complicated cases with lump formation resolve on medical management and kept on long term follow up. Nearly 10% of them need appendectomy on recurrence of symptoms. Thus, author do not advise to follow old dictum of advising surgery in all the cases of simple and complicated appendicitis on long term follow up.

We recommend ileal loop diversion in all complicated cases associated with cecal perforation. Cecectomy or even limited hemicolectomy is done in friable caecum. Routine terminal ileostomy and distal colonic mucous fistula is made followed by delayed ileocolic anastomosis. Surgical time could be minimized by opening ileal loop after 48 hours and closing the abdomen in single layer specially in hemodynamically unstable patients. Thus, management is tailor-made as per the condition.

Author recommends to avoid unscrupulous handling of bowel in complicated cases in their pursuit to search appendix. It is better to close after putting the drains and avoid formation of fecal fistulas for a better prognosis. Hence utmost precision and expertise is needed to minimize morbidity and mortality in complicated cases of appendicitis. Vigilant observation is needed to detect perforation in time. Surgical intervention should not be delayed in such cases. We also aim to minimize negative appendectomy. Researches, observations and revisions in treatment policy need to be continued. My endeavor to explore more and more will also continue which will be shared with the clinical fraternity time to time.

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