International Surgery Journal
Vagholkar K. Int Surg J. 2020 Jul;7(7):2461-2463
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

Review Article

DOI: http://dx.doi.org/10.18203/2349-2902.isj20202872

Stump appendicitis

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Received: 08 May 2020
Accepted: 12 June 2020

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ABSTRACT

Appendectomy is one of the commonest abdominal operation performed all over the world. Stump appendicitis is one of the uncommon complications of appendectomy. The diagnosis of stump appendicitis is delayed due to low index of suspicion by virtue of the fact that an appendectomy has already been done. The clinical presentation exactly simulates acute appendicitis. Contrast enhanced computed tomography is diagnostic. Completion appendectomy either open or laparoscopic is the mainstay of treatment. Awareness regarding the possible aetiology, diagnosis and management is essential for avoiding delay in the diagnosis.

Keywords: Diagnosis, Stump appendicitis, Treatment

INTRODUCTION

Appendectomy for acute appendicitis is one of the commonest emergency operation performed by a general surgeon. The usual complications include infection, abscess formation and the development of herniation which can be managed without difficulty.[1] However stump appendicitis is one of the uncommon complications encountered.[1] It is one of the rare delayed complication of appendectomy first described by Rose in 1945.[2] The incidence is 1 per 50,000 appendectomies performed.[3] However the disease is grossly under reported.[3,4] Delay in diagnosis is due to poor awareness of this condition. The possible etiopathogenesis, diagnosis and management options are presented in this paper.

ETIOPATHOGENESIS

Appendectomy is an operation which can be performed laparoscopically or by traditional open method. As stump appendicitis was identified and started evolving as an entity, it was thought that the incidence was higher following laparoscopic appendectomy.[5] The potential limitations of laparoscopic appendectomy which could increase the incidence of leaving a longer stump are a smaller field of vision, lack of 3D perspective and absence of tactile feedback.[5] However review of literature reveals that it is prevalent even in patients who have undergone open appendectomy.[6] Under reporting of the condition has led to underestimation of true incidence of the condition.

Various technical observations have been cited to explain the aetiology. These can be classified into two groups viz. anatomical and surgical.

Position of the appendix is the biggest anatomical cause predisposing to stump appendicitis. Retrocaecal, subserous position and rarely duplication of the appendix are possible etiological factors.[4-6] Retrocecal position of the appendix in an inflamed state is extremely difficult to identify and dissect. Hesitancy on the part of the operating surgeon due to fear of damaging the caecum precludes identification of the junction of the appendix with the caecum at the point of convergence of the taenia coli. This leads to ligation at a higher level thereby leaving behind a longer stump. A short segment of subserosal location of the appendix near to the base may confuse the surgeon in an inflamed setting of the region.

As a result ligation is done distally thereby leaving behind the subserosal segment of the appendix.[7] Duplication of appendix is rare and should not be missed at the time of surgery. The length of the remnant stump ranges from 5 mm to 65 mm in stump appendicitis.[7]

The surgical factors contributing to stump appendicitis are technical in nature. The most important factor is failure to reach the base of the appendix. Irrespective of the type of appendectomy, identification and anatomical confirmation of the base are of utmost importance before ligation.[6-8]

The two steps which a surgeon has to meticulously follow are ligation or cauterization of the recurrent branch of the appendicular artery as this is a crucial landmark for the base having been reached.[9,10] From the caecal side, identification of the point of convergence of the taenia coli is important. The appendix will emerge from this point. This point is usually 3 cm below the ileocaecal junction on the posteromedial wall of the caecum.[11,12]

Identification of these landmarks ensures that the base of the appendix has been reached. A ligature or endoloop can then be safely applied. The length of the stump is another important concern. It should ideally be approximately 3 mm and should not exceed 5 mm. Shorter the length, better the outcome.

In case of open appendectomy, inversion of the stump is easier if the stump is as short as possible that is approximately 3 mm long.[13,14] This enables uniform circumferential burial after the purse string suture around the base is tightened. The common cause for hesitancy to reach and identify the base is to avoid damage to the caecal base which many a times could be oedematous and friable. This compels the surgeon to apply the ligature or endoloop a little further away from the base.[15-17] However, this has to be avoided at any cost if one has to prevent a stump appendicitis at a later date.[18]

Therefore the important technical point is that inappropriate identification of the base of the appendix is the main predisposing factor for stump appendicitis.

The pathogenesis of stump appendicitis similar to that of acute appendicitis. It is usually obstructive in nature due to a faecolith. This is followed by a chain of events eventually leading to severe inflammation and local sepsis to start with. If untreated then a perforation with the formation of an abscess is the end result. A series of complications have been described for stump appendicitis.[14-17]

These include small bowel obstruction; haemorrhage from the remnant mesoappendix; localized retrocaecal abscess; generalized peritonitis; rarely malignancy and endometriosis.

CLINICAL FEATURES

The clinical presentation of stump appendicitis is exactly similar to acute appendicitis.[18]

Pain starting in the periumbilical region and then localizing to the right iliac fossa; fever which is continuous to start with but may be accompanied by chills or rigors once an abscess is formed; nausea, anorexia and vomiting as the pathology proceeds.

History of previous appendectomy is a crucial component of history irrespective of when the appendectomy was performed. The period may range from two months to fifty years. But history of previous appendectomy should immediately raise the suspicion of stump appendicitis.

Physical examination of the abdomen will reveal tenderness, rebound tenderness, guarding or rigidity in the right lower abdomen depending upon the severity of the inflammatory process. Per digital rectal examination could reveal bogginess or tenderness on the right side if a localized abscess has developed.[19]

INVESTIGATIONS AND DIAGNOSIS

Neutrophilic leucocytosis and raised C reactive protein is a strong supportive evidence for the ongoing inflammatory process. However imaging is necessary for confirmation of diagnosis and provision of a road map to plan surgical treatment.

A strong index of suspicion of stump appendicitis before radiological evaluation will not only facilitate accurate diagnosis but will avoid delay in commencing treatment thereby reducing complications. Ultrasound findings include a thickened appendix stump, fluid in the right iliac fossa and oedema of the caecum.[12] However ultrasound is performer dependent. Ultrasound is good enough if there is a high index of suspicion and if one is familiar with the ultrasound findings in stump appendicitis. Ultrasound examination of the region may not always help in confirming the diagnosis in stump appendicitis if there are adhesions in the region. Computed tomography (CT) is the investigation of choice in such circumstances. CT not only confirms the diagnosis but also enables exclusion of other pathologies.[13-15]

CT findings in stump appendicitis are: tubular structure arising from the caecum with adjacent fat stranding, pericaecal phlegmon or abscess, thickening of caecal wall, oral contrast material insinuating into the expected location of the appendicular origin which is typically described as arrowhead sign.[14]

Once the diagnosis is confirmed a surgical plan has to be developed. Intravenous antibiotics and hydration is necessary for optimising the patient's general condition.

After this is achieved surgery remains the mainstay of treatment.

Completion appendectomy is the treatment of choice.[20,21] This can be done laparoscopically or by open method. The surgery is quite challenging and should be done by an experienced surgeon. The remnant stump needs to be dissected and then ligated at the base.[22-24] Under rare circumstances, if severe inflammatory adhesions are encountered around the ileocaecal region then a right hemicolectomy may be done.[25]

CONCLUSION

Stump appendicitis is a rare complication of an inadequately performed appendectomy. Awareness of this distinct entity is essential. A high index of clinical suspicion supported by radiological investigations is necessary to prevent delay in diagnosis. Completion appendectomy is the mainstay of treatment.

ACKOWLEDGEMENTS

Author would like to thank Parth Vagholkar for his help in typesetting the manuscript.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: not required

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Cite this article as: Vagholkar K. Stump appendicitis. Int Surg J 2020;7:2461-3.