

Appendicular perforation

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Abstract

Introduction: Appendicitis is the most common acute abdominal condition presenting in hospital. Appendicular perforation is a major complication of appendicitis. The objective of the study is review the cases of appendicular perforation in respect of its incidence, sex preference, clinical features, investigations, treatment and postoperative wound infections

Methods: A retrospective study was conducted reviewing the records of the patients who were admitted in Dhulikhel hospital with the diagnosis of appendicular perforation from January 2009 to December 2010.

Results: A total of 332 cases of appendicular disease were admitted during the study period. Out of them, 42 patients had appendicular perforation. It constituted 12.6% of total appendicular diseases. The male to female ratio in perforation was 6.1: 1. The common age group for the perforation was 30-50 years with mean age of 35 years. The mean duration of pain before presentation to the hospital was 4.5 days.

All the cases of appendicular perforation had spread of pain from right iliac fossa to all over the abdomen, and anorexia. Vomiting was found in 83.33% of the cases. All the cases had rebound tenderness and rigidity all over the abdomen. None had free gas under diaphragm. Retrocaecal shaft perforation was found in most of the cases. Post operative wound infection was found in 14.2% of the cases.

Conclusions: Appendicular perforation is a severe complication of appendicitis. Appendicular perforation has no sex preference. It is common in elderly age group. Spread of pain from right iliac fossa to all over the abdomen, anorexia and rebound tenderness were found in all cases. Elevated total leukocytes count and shift to left were significant in case of appendicular perforation. Retrocaecal appendix is more prone to perforation.

Key words: Appendicitis, appendicular disease, appendicular perforation

Introduction

Appendicitis is the most common acute abdominal condition presenting to hospital¹. The disease occurs at all ages but is most frequent in the 2nd and 3rd decades of life.² The higher awareness about disease and its complications, higher access to health care and health insurance in the developed countries has shown fewer complications of the

appendicitis with early detection and surgery following acute symptoms. The situation is different in developing nations where poverty, illiteracy and high cost of medical treatment make them slow to report to health facility leading to high complications.³

Appendicular perforation is the most severe complication of appendicitis.

Appendicular perforation

Methods

A retrospective study was conducted reviewing all the records of the patients admitted in Dhulikhel hospital with the diagnosis of appendicular perforation during the period from January 2009 to December 2010. All the cases of appendicular perforation were included in the study with no exclusion. All the appendicular diseases were diagnosed by the qualified general surgeon on the basis of clinical features and investigations.

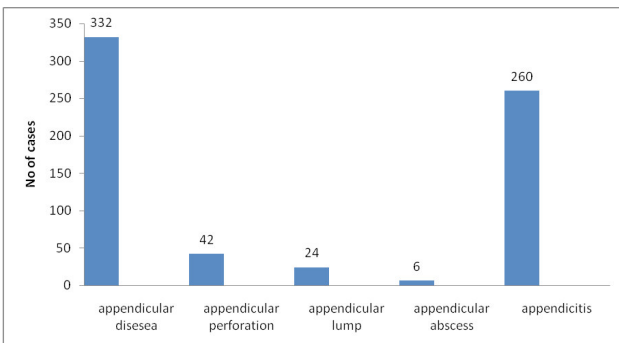
Data related with age, gender, clinical features, duration of pain before presenting to hospital, investigation findings, and post operative wound infection were collected.

Data were analyzed with the help of Microsoft Excel 2003.

Results

A total of 332 cases related to appendix were admitted during the study period. Out of them, 260 were appendicitis and 42 were appendicular perforation (Fig 1).

Fig 1: Appendicular diseases



The ratio of appendicitis to appendicular perforation was 6.1:1. The male to female ratio of appendicitis was 1.7:1. Among appendicular perforation male to female ratio was 1.3:1. The age of the patients with appendicular perforation varied from 16 to 75 years with median age of 35 years (Table 1).

Table 1: Age distribution of appendicular perforation

Age in years	Our study	Rajbhandari <i>et al</i>
<18	8 (15%)	6 (18.75%)
18-30	6 (11.5%)	5 (15.6%)
31-50	20 (38%)	14 (43.7%)
>50	8 (15.5%)	7 (21.8%)

Mean duration of pain before presentation to the hospital was 4.5 days, ranging from 1 day to 10 days. All the cases of appendicular perforation had history of spread of pain from right iliac fossa to all over the abdomen over few hours to days. However, only 84.6% of the cases gave history of

shifting of pain from paraumbilical area to right iliac fossa.

Anorexia was present in all the cases. Vomiting was found in 35 (83.33%) cases. On per abdominal examination, all the patients had rebound tenderness and rigidity all over the abdomen (Table 2).

Table 2: Signs and symptoms of appendicular perforation

Sign and symptoms	Our study	Rajbhandari <i>et al</i>	Guljar <i>et al</i>
Spread of pain abdomen	100%	100%	100%
Anorexia	100%	100%	87%
Vomiting	83.33%	81%	72%
Rebound tenderness	100%	100%	72%
Guarding over all abdomen	100%	81%	100%

The total leukocytes count had a median of 16,800 per cubic millimeter. Thirty-three (78.57%) cases had leukocytes count more than 11,000 per cubic millimeter. The median neutrophils count was 85%. Most (n=38) of the cases had neutrophilia (Table 3). None of the patients of appendicular perforation showed evidence of free gas under diaphragm in erect chest X-ray. Only 11 cases had ultrasound of abdomen done before surgery. All showed free fluid in abdomen, mainly in right iliac fossa.

Table 3: Total leukocytes and neutrophil count

Blood investigation	Present study	Rajbhandari <i>et al</i>
Total leukocytes count	Median 16,800per cu mm >11,000 per cu mm Median 13,700 per cu mm.	78.57% >60% >11,000 per cu mm
Neutrophilia with shift to left	90.47%	87%

All the cases underwent lower midline laparotomy. Perforated appendices were found in retrocaecal position in 26 (61.90%) cases. Perforation was found at the shaft of appendix in 22 (52.38%) cases. Rest of the cases had perforation at the tip of the appendix. All the cases received post operative antibiotics for the median of 5 days. The hospital stay was a median of 8 days, ranging from 5 to 14 days. Only 6 (14.2%) patients had post operative wound infection. All cases required secondary suturing of the wound. Histopathological analysis revealed gangrenous appendicitis in 33 (78.57%) cases.

Discussion

Appendicitis is the most common abdominal emergency.¹ Appendicular perforation is a major complication of appendicitis. Appendicular perforation constituted 12.6% of the appendicular diseases. In our study, the common age group of appendicular perforation was 30-

50 years with the mean of 35 years which was similar to that observed by Rajbhandari et al.⁴

The male to female ratio of appendicitis was found 1.7:1 in our study. It is comparable to other similar studies^{4,6}. The ratio of male to female in appendicular perforation was 1.3:1. This is different from the study done by Sheu *et al.*⁷ Our study revealed that even though more male suffered from appendicitis, fewer male patients presented with appendicular perforation, the reason behind may be early presentation and treatment in male because of male dominant society. Risk of perforation was greater with 36 hours or more of untreated symptoms as per the study done in New York in 2006.⁸ The mean duration of pain before presentation was found to be 4.5 days in our study. It is comparable to the finding of the study done by Rajbhandari et al.⁴

The symptom of pain abdomen was found in all cases in our study which was similar to other studies reported in 2007.^{4,9} The pain in all appendicular perforation was initially in right iliac fossa spreading all over the abdomen. In our study, anorexia was found in all cases of appendicular perforation. Rajbhandari et al had also shown anorexia in all the cases; however, in the study done by Gulzar et al⁹, anorexia was found in 87% of the cases.^{4,9} Usually, 51-69% of the patients with appendicular perforation presents with vomiting.^{10,11} In our study, 35 (83.33%) of the cases had vomiting which was similar to other studies.^{4,9} Rebound tenderness and rigidity were found in all of our cases of appendicular perforation.

High total leukocytes count is considered as a risk factor for perforation in appendicitis.⁷ This is also true in our study. Thirty-three (78.57%) cases of appendicular perforation had high leukocytes count (>11,000 per cubic millimeter) with the mean count being 16,800 per cubic millimeter. Neutrophilia was found in 38 (90.47%) of the cases which were also similar to other studies.^{4,9} Perforated appendices were found in retrocaecal position in 26 (61.90%) cases. The finding is comparable to the study done in Taiwan which showed retrocaecal appendix in 72%.⁷ In our study, 22 (52.38%) cases had perforation at the shaft of appendix. Perforation at the shaft of appendix was found in 46% of the cases in a study done by Rajbhandari et al.⁴ Postoperative wound infection was found in 6 (14.2%) cases in our study. Other studies reported postoperative wound infection to be 15%, 14.3% and 20% respectively.^{4,8,12}

Conclusions

Appendicular perforation is a severe complication of appendicitis and has no sex predilection. It is common in

elderly age group. Generalized abdominal tenderness spreading from right iliac fossa, anorexia and rebound tenderness is the commonest presentation. Elevated total leukocytes count and shift to left are significant in cases of appendicular perforation. Retrocaecal appendix is more prone to perforation.

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