

Comparative study of outcome of conservative versus operative management in 50 cases of appendicular lump

Pratik H Vyas, Amitkumar H Joshi, Kamlesh Ram, Sanjog Chandana, Samip Koshti

Department of Surgery, Smt. NHL Municipal Medical College, Ahmedabad, Gujarat, India.
Correspondence to: Amitkumar H Joshi, E-mail: dr.amit_joshi@yahoo.com

Received November 24, 2015. Accepted December 03, 2015

Abstract

Background: To compare the different modes of management of appendicular lump whether traditional emergency operation or conservative management.

Objective: To evaluate the outcome of emergency surgery versus conservative management in patients with complicated appendicitis with appendicular lump/abscess undergoing interval appendectomy.

Materials and Methods: This is a prospective observational study of total 50 cases of complicated appendicitis with appendicular lump/abscess. A total of 18 patients were treated for emergency operations and rest were treated conservatively with antibiotics alone ($n = 26$) and antibiotics with percutaneous drainage ($n = 6$). Twenty-four patients who were initially treated conservatively, underwent planned interval operations later.

Result: The mean age of the patients was 50.8 years, and the ratio of men to women was 27:23. Among them, the emergency surgery group included 18 patients (36%) and the conservative treatment group included 32 patients (64%). Duration of symptoms was 7 days in group 1 compared to 9 days in group 2. White blood cells (WBCs) count was similar in both groups. During emergency surgery, three patients (15%) require resection, whereas none underwent in planned group. Duration of surgery was 115 and 100 min in emergency and planned groups, respectively. The complication rate was higher (almost twice) in emergency group compared to planned group. The hospital stay was 12 and 9 days in emergency and planned groups, respectively.

Conclusion: The results of this study state that appendicitis complicated with an abscess or mass could be treated safely and effectively by initially using conservative management.

KEY WORDS: Appendicitis, lump, operative management, conservative management, mortality, morbidity

Introduction

Appendicitis is the most common cause of pain requiring surgery. The lifetime risk of developing appendicitis is 8.6% for men and 6.7% for women, with the highest incidence in the second and third decades. The yearly incidence rate of perforated appendicitis is about 2 per 10,000. The proportion

of perforated appendicitis is commonly around 25%. Children less than 5 years of age and patients more than 65 years of age have the highest rates of perforation (45% and 51%, respectively). The risk of perforation increases with increasing duration of symptoms.

In many cases, rupture is contained and patients display localized peritonitis. In 2–6% cases, a palpable mass is detected on physical examination. This could represent a *phlegmon*, which consists of matted loops of bowel adherent to the adjacent inflamed appendix or a periappendiceal abscess.

When emergency surgery is performed on such cases, due to inflammation in a wide area within the abdominal cavity, adhesion of the intestines, sepsis after surgery, fluid collection within the abdominal cavity, and re-surgery for adhesion of the intestines, healing of surgical wounds has been shown to be delayed substantially.

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2016.24112015228	

International Journal of Medical Science and Public Health Online 2016. © 2016 Amitkumar H Joshi. This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

Therefore, recently, for patients suspected of having appendicitis associated with an abscess in the periappendix, instead of traditional emergency surgery, the trend has been to perform conservative treatments, for example, ultrasound-guided percutaneous drainage and antibiotic treatments first and subsequently to perform an interval appendectomy after a certain time: nonetheless, until now, standard treatment protocols have not been established, so this issue is still controversial.

In this study, we compared outcome regarding which patient requires emergency surgery versus conservative management and to further compare the outcome of the patients of conservative category that underwent interval appendectomy.

Material and Methods

This is a prospective observational study of total 50 cases of complicated appendicitis with appendicular lump/abscess. A total of 18 patients were treated for emergency operations and rest were treated conservatively with antibiotics alone ($n = 26$) and antibiotics with percutaneous drainage ($n = 6$). Of the 32 patients, 24 underwent conservative treatment initially and planned interval operations later (Figure 1).

Patients who underwent emergency surgery were defined as the “emergency surgery group” (Group 1; $n = 18$). Patients treated with conservative management (use of antibiotics with or without ultrasound-guided percutaneous drainage)

Group 1	Emergency surgery group
Group 2	Conservative group
• 2A	Patients who underwent interval appendectomy
• 2B	High-risk patients who were kept on follow-up
• 2C	Patients on follow-up who underwent appendectomy due to recurrent appendicitis

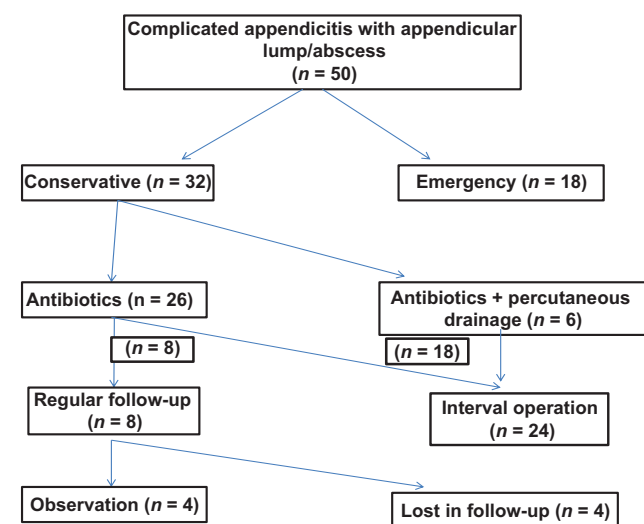


Figure 1: Patients’ recruitment procedure.

were defined as the “conservative treatment group” (Group 2; $n = 32$), which was subdivided into the interval surgery group whose patients underwent surgery at a certain time after the initial treatments (Group 2A), the ambulatory follow-up observation group whose patients underwent ambulatory follow-up observation continuously (Group 2B) and the those patients of follow-up who underwent appendectomy for recurrent appendicitis (Group 2C).

The clinical characteristics of patients, the type of surgery, and the follow-up observation were analyzed based on medical records. The follow-up observation period was from the day of the first visit to the most recent visit to our outpatient clinic. As clinical characteristics, the gender of the patients, age, major symptoms, the duration of pain prior to admission, body temperature at the time of admission, heartbeat, the number of leukocytes, the presence or absence of an abscess or masses in the periappendix and size, and associated chronic diseases were assessed.

With regard to treatment, performance of emergency surgery, percutaneous drainage, and interval surgery after the initial conservative treatments were assessed. In the ambulatory follow-up observation group, recurrence and surgery during the ambulatory follow-up observation period were assessed.

Regarding patients who underwent surgery, the period from the onset of symptoms to the day of operation, surgical methods, operation time, the postsurgical hospitalization period, and postsurgical complications were analyzed.

Result

The mean age of the patients was 50.8 years, and the ratio of men to women was 27:23. Among them, the emergency surgery group included 18 patients (36%) and the conservative treatment group included 32 patients (64%). During the period, the number of patients who underwent an appendectomy at our hospital was 5,203 patients, and our subjects accounted for approximately 0.96% of all patients with appendicitis.

Clinical characteristics of the conservative group and the emergency operation groups were not statistically different (Table 1).

Analysis of the Patient Group Requiring Surgery after Conservative Management (Group 2A)

Among patients treated with conservative management in the initial period, 26 patients (81.25%) were treated with only antibiotics, and 6 patients (18.75%) were treated with antibiotics in parallel with ultrasound-guided percutaneous drainage. Interval surgery after conservative management was performed on 24 patients (81.2%, interval surgery group), and 8 patients (25%) underwent only follow-up observation, out of which 4 with no intention to undergo interval surgery and 4 were lost in follow-up. The mean age of the interval surgery group (24 patients) was 49.2 years, and the ratio of men to women was 10:14. The mean period from the onset of symptoms to hospital visit was 9.7 days. At the time of admission, the mean body temperature was 36.5°C, and the mean heart

Table 1: Comparison of clinical characteristics between emergency and conservative groups

	Group 1	Group 2
Sex (M/F)	10:8	17:15
Mean age (years)	47.64	52.71
Duration of symptoms (days)	6.79	9.74
Body temperature (°C)	37.13	36.74
Heart rate (pulse/min)	87.52	85.76
WBC count	13,253	13,2013
Size of abscess (cm)	4.41	4.95

Table 2: Comparison of surgical outcomes between emergency and delayed operation groups

	Group 1 (n = 18)	Group 2A (n = 24)
Operations		
Appendectomy	16	21
Ileocectomy	2	2
Right hemicolectomy	–	1
Operation time (min)	104.82	88.19
Postoperation complications	7	4
Postoperation hospital stay	11.43	9.0

Table 3: Comparison of surgical outcomes between emergency and delayed operation groups

	Group 1 (n = 24)	Group 2A (n = 8)
Sex (M/F)	11:13	3:5
Age (years)	49.27	56.77
Duration of pain (days)	9.72	9.76
Body temperature (°C)	36.57	36.58
Heart rate (pulse/min)	84.57	86.95
WBC count	13847.31	12438.78
PCD	6	2
Size of abscess (cm)	4.65	5.33

beat was 84.5 times/min. On the blood test, the mean number of leucocytes was 13,847.3/mm², the mean size of the abscess was 4.6 cm (range, 3–5.5 cm).

Interval surgery was performed after a mean period of 24 days (range, 5–64 days) from the time of initiation of conservative management. Seventeen patients (70.83%) had symptoms that improved.

Comparison of the Results of Surgery in the Emergency Surgery Group (Group 1) with the Interval Surgery Group (Group 2A)

Surgery was determined according to the inflammation level at the time of surgery. In the interval surgery after conservative management group (n = 24), a simple appendectomy was performed on 21 patients (87.5%), an ileocectomy was

performed on 2 patients (8.33%), and a right hemicolectomy was performed on 1 patient (3.125%). The interval from the onset of initial symptoms to the day of surgery was an average 26 days. Postsurgical complications developed in three patients (12.5%); wound infection in three cases.

In the emergency surgery group, a simple appendectomy was performed on 16 patients (88.88%) and an ileocectomy was performed on 2 patients (11.11%). Postsurgical complications developed in two patients (11.11%) and surgical wound infection developed in two patients.

When the emergency surgery group and the interval surgery group were compared, surgical methods, operation time, postsurgical complications, and the postsurgical hospitalization period were not statistically significantly different (Table 2).

Analysis of the Ambulatory Follow-up Observation Group Without Planned Interval Surgery after Conservative Management (Group 2B)

The mean age of the group that only underwent ambulatory follow-up observation without interval surgery after conservative management ($n = 8$) was 56.7 years, and the ratio of men to women was 3:5. The mean interval from the onset of symptoms to hospital visit was 9.7 days. At the time of admission, the mean body temperature was 36.6°C, and the mean heart beat was 86.9 beats/min. On the blood test, the number of leucocytes was an average 12,438.7/mm³, and the size of the abscess was an average 5.3 cm (range 2.5–7 cm). In seven patients (87.5%), only antibiotic treatments were performed, and in the remaining one patient (12.5%), ultrasound-guided percutaneous drainage was additionally performed. When the interval surgery group (Group 2A) and the ambulatory follow-up observation group (Group 2B) were compared, gender, age, the duration of pain prior to admission, body temperature, heartbeat, number of leucocytes, and size of the abscess were not statistically significant; nonetheless, in the interval surgery group, the number of patients who underwent ultrasound-guided percutaneous drainage was significantly higher (Table 3).

The mean follow-up observation period of the ambulatory follow-up observation group was an average 37.8 months (range, 1–82.2 months). Surgery was performed on two patients (26.5%, Group 2C) for recurrent appendicitis. The period after conservative management to the recurrence of symptoms was an average 42.3 days, and the interval from the onset of the initial symptoms to the day of surgery was an average 56.7 days. As postsurgical complications, surgical wound infection occurred in one patient (33%). When the interval surgery group and the recurrence surgery group were compared, surgical method, operation time, postsurgical complications, and postsurgical hospitalization time were not statistically significant.

Discussion

Among total, the emergency surgery group included 18 patients (36%) and the conservative treatment group included 32 patients (64%). Duration of symptoms was 7 days in group 1 compared to 9 days in group 2.

WBC count was similar in both groups. During emergency surgery, three patients (15%) required resection, whereas in planned group none underwent resection. Duration of surgery in emergency was 115 min compared to 100 min in planned group. The complication rate is higher (almost double) in emergency and hospital stay is also more 12 days as compared to 9 days in planned group.

In patients with acute appendicitis, the proportion of cases associated with an abscess or a lump in the periappendix has been reported to be approximately 2%–7%. When emergency surgery is performed in such patients, the incidence of complications is reported to be up to 26%. If surgery is performed, the inflammation may spread over a wide area.

In addition, because of edema and the vulnerability of the adjacent small intestine and large intestine, injury may occur or secondary fistulas may develop. Furthermore, in emergency surgeries, the approach to the appendix is difficult due to inflamed tissues, and surgery may be technically difficult due to deformation of anatomical structures and location. For such cases, instead of completing surgery after a simple appendectomy, some cases require an ileocecectomy in areas with inflammation and adhesion or rarely even a right hemicolectomy.

In our study, among the total 50 patients, conservative managements were performed on 32 patients (64.0%), and in 28 of those patients (90.0%), symptoms improved by early conservative management. The remaining four patients (10%) required surgery due to worsening symptoms. Similarly, between the group that underwent interval surgery after conservative managements and the group that underwent emergency surgery, treatment outcomes, such as the frequency of an enterectomy, operation time, complications, and postsurgical hospitalization period, were not statistically different. Therefore, in our study, similar to the results of other previous studies, early conservative management of appendicitis associated with an abscess or mass was confirmed to be safe. The incidence of postsurgical complications in emergency surgery group was slightly more.

In our study, in 8 of 32 patients (25.0%), only follow-up observation was performed without interval surgery because they belonged to high-risk group. Appendicitis recurred in three of those eight patients (37.5%), and a simple emergency appendectomy was performed. This confirmed that with intensive follow-up observation after conservative management, recurrence of appendicitis could be detected early and surgical treatments could be administered safely.

Similar studies performed by Hurme and Nylamo^[9] and by Samuel *et al.*^[16] show similar results of the role of conservative management in acute condition.

Conclusion

The results of this study state that appendicitis associated with an abscess or mass could be treated safely and effectively by initially using conservative managements. In addition, it also confirmed that even in cases involving only ambulatory follow-up observation without interval surgery after conservative managements, the recurrence rate was not high, recurrence of appendicitis was detected early, and surgical treatments could be performed safely.

Therefore, as treatment for appendicitis associated with an abscess or mass, the decision whether to perform initial emergency surgery or to perform conservative managements, and if conservative managements are performed, whether to perform interval surgery after a certain period or to perform only the ambulatory follow-up observation depends on the surgeon's overall evaluation of the clinical features of the individuals.

References

- Kirkwood KS, Maa J. The appendix. In: *Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice*, Sabiston DC, Townsend CM (Eds.), 18th edn. Philadelphia, PA: Saunders/Elsevier, 2008. pp. 1333–47.
- Bradley EL 3rd, Isaacs J. Appendiceal abscess revisited. *Arch Surg* 1978;113:130–2.
- Arnbjornsson E. Management of appendiceal abscess. *Curr Surg* 1984;41:4–9.
- Bagi P, Dueholm S. Nonoperative management of the ultrasonically evaluated appendiceal mass. *Surgery* 1987;101:602–5.
- Shipsey MR, O'Donnell B. Conservative management of appendix mass in children. *Ann R Coll Surg Engl* 1985;67:23–4.
- Willemssen PJ, Hoorntje LE, Eddes EH, Ploeg RJ. The need for interval appendectomy after resolution of an appendiceal mass questioned. *Dig Surg* 2002;19:216–20.
- Kang YM, Lee MS, Park KK, Song OP, Park HJ. Cecectomy with primary anastomosis in severely complicated appendicitis. *J Korean Soc Coloproctol* 1995;11:265–8.
- Mosegaard A, Nielsen OS. Interval appendectomy: a retrospective study. *Acta Chir Scand* 1979;145:109–11.
- Hurme T, Nylamo E. Conservative versus operative treatment of appendicular abscess: experience of 147 consecutive patients. *Ann Chir Gynaecol* 1995;84:33–6.
- Ein SH, Shandling B. Is interval appendectomy necessary after rupture of an appendiceal mass? *J Pediatr Surg* 1996;31:849–50.
- Karaca I, Altintoprak Z, Karkiner A, Temir G, Mir E. The management of appendiceal mass in children: is interval appendectomy necessary? *Surg Today* 2001;31:675–7.
- Tingstedt B, Bexer-Lindskog E, Ekelund M, Andersson R. Management of appendiceal masses. *Eur J Surg* 2002;168:579–82.
- Erdogan D, Karaman I, Narci A, Karaman A, Cavusoglu YH, Aslan MK, et al. Comparison of two methods for the management of appendicular mass in children. *Pediatr Surg Int* 2005; 21:81–3.
- Poon RT, Chu KW. Inflammatory cecal masses in patients presenting with appendicitis. *World J Surg* 1999;23:713–6.
- Foran B, Berne TV, Rosoff L. Management of the appendiceal mass. *Arch Surg* 1978;113:1144–5.
- Samuel M, Hosie G, Holmes K. Prospective evaluation of nonsurgical versus surgical management of appendiceal mass. *J Pediatr Surg* 2002;37:882–6.
- Skoubo-Kristensen E, Hvid I. The appendiceal mass: results of conservative management. *Ann Surg* 1982;196:584–7.
- Gillick J, Velayudham M, Puri P. Conservative management of appendix mass in children. *Br J Surg* 2001;88:1539–42.
- Lai HW, Loong CC, Chiu JH, Chau GY, Wu CW, Lui WY. Interval appendectomy after conservative treatment of an appendiceal mass. *World J Surg* 2006;30:352–7.
- Jordan JS, Kovalcik PJ, Schwab CW. Appendicitis with a palpable mass. *Ann Surg* 1981;193:227–9.
- Brown CV, Abrishami M, Muller M, Velmahos GC. Appendiceal abscess: immediate operation or percutaneous drainage? *Am Surg* 2003;69:829–32.
- Friedell ML, Perez-Izquierdo M. Is there a role for interval appendectomy in the management of acute appendicitis? *Am Surg* 2000;66:1158–62.
- Bufo AJ, Shah RS, Li MH, Cyr NA, Hollabaugh RS, Hixson SD, et al. Interval appendectomy for perforated appendicitis in children. *J Laparoendosc Adv Surg Tech A* 1998;8:209–14.
- Kumar S, Jain S. Treatment of appendiceal mass: prospective, randomized clinical trial. *Indian J Gastroenterol* 2004;23:165–7.
- Kaminski A, Liu IL, Applebaum H, Lee SL, Haigh PI. Routine interval appendectomy is not justified after initial nonoperative treatment of acute appendicitis. *Arch Surg* 2005;140:897–901.
- Oliak D, Yamini D, Udani VM, Lewis RJ, Arnell T, Vargas H, et al. Initial nonoperative management for periappendiceal abscess. *Dis Colon Rectum* 2001;44:936–41.
- Kim JP, Son CM. Review of the pathology and differential diagnosis of acute appendicitis. *J Korean Soc Coloproctol* 2003;19:211–5.
- Nitecki S, Assalia A, Schein M. Contemporary management of the appendiceal mass. *Br J Surg* 1993;80:18–20.
- Andersson RE, Petzold MG. Nonsurgical treatment of appendiceal abscess or phlegmon: a systematic review and meta-analysis. *Ann Surg* 2007;246:741–8.

How to cite this article: Vyas PH, Joshi AH, Ram K, Chandana S, Koshti S. Comparative study of outcome of conservative versus operative management in 50 cases of appendicular lump. *Int J Med Sci Public Health* 2016;5:749-753

Source of Support: Nil, **Conflict of Interest:** None declared.