Does Ochsner-Sherren regimen still hold true in the management of appendicular mass?

Ochsner-Sherren rejimi halen apendiküler kitle tedavisinin düzenlenmesinde geçerli midir?

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BACKGROUND

Although proposed as far back as 1901, conservative management for appendicular mass is still widely practiced. With a few recent series outlining the advantages of early appendicectomy for appendicular mass, we tried to investigate the feasibility of such an approach in this retrospective study.

METHODS

We analyzed retrospectively 506 patients (240 male, 266 female) who underwent emergency appendicectomy for suspected appendicitis and appendicular mass between January 2005 and December 2007. Patients with sub-acute/chronic appendicitis and interval appendicectomy were excluded. The postoperative outcomes were compared between the two groups of patients classified as with or without the mass.

RESULTS

A total of 506 patients were included in the study, of which 114 had appendicular mass. A comparison of the two groups demonstrated no major complications in either group. There was significantly increased incidence of minor complications in the group of patients with mass, although the incidence of wound infection showed no significance difference between the two groups. There was a significantly increased usage of drain / duration of stay in patients with mass.

CONCLUSION

Low morbidity, reduced hospital stay, low cost, and patient compliance favor early operative management for appendicular mass, and it also avoids the possibility of missing entities like intestinal/peritoneal tuberculosis, which have similar presentations and are especially common in a country like India.

Key Words: Appendicectomy; appendicular mass; ileocecal tuberculosis; laparoscopy; wound infection.

AMAÇ

Her ne kadar, 1901 yılına kadar uzanan bir geçmişte önerilen yaklaşım olmakla birlikte, apendiküler kitleye yönelik konservatif tedavi halen yaygın şekilde uygulanmaktadır. Apendiküler kitle ile ilgili erken apendektominin avantajları konusunda bilgi veren son zamanlarda yapılmış az sayıda seriyle birlikte, bu retrospektif çalışmada hastalara bu tip yaklaşımın yapılabilirliği araştırıldı.

GEREÇ VE YÖNTEM

Ocak 2005 ile Aralık 2007 arasında şüpheli apandisit ve apendiküler kitle nedeniyle acil apendektomi uygulanan 506 hasta (240 erkek, 266 kadın) geriye dönük olarak değerlendirildi. Subakut/kronik apandisiti bulunan ve interval apendektomi uygulanan hastalar çalışma dışında tutuldu. Ameliyat sonrası sonuçlar, apendiküler kitlesi bulunan ve bulunmayan hastalardan oluşan iki grup arasında karşılaştırıldı.

BULGULAR

Çalışmaya, 114'ünde apendiküler kitle bulunan toplam 506 hasta alındı. İki grup karşılaştırıldığında, her iki grupta da hiçbir majör komplikasyon saptanmadı. Apendiküler kitlesi bulunan hastalardan oluşan grupta minör komplikasyon insidansı anlamlı şekilde artarken, yara enfeksiyonu insidansı bakımından iki grup arasında anlamlılık saptanmadı. Apendiküler kitlesi olan hastalarda, anlamlı şekilde yüksek dren kullanımı/hastanede kalma süresi olduğu saptandı.

SONUÇ

Düşük morbidite, azalan hastanede kalma süresi, düşük maliyet ve hasta uyumu, Hindistan gibi bir ülkede özellikle yaygın olan ve benzer bulgularla başvuran intestinal/peritoneal tüberküloz gibi olguları atlamaksızın, apendiküler kitleye yönelik erken cerrahi tedaviyi desteklemektedir.

Anahtar Sözcükler: Apendektomi; apendiküler kitle; ileoçekal tüberküloz; laparoskopi; yara enfeksiyonu.

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Surgical training from Sushrutha's times has been based mainly on apprenticeship. In surgery, there is a limited body of evidence from high quality randomized control trials. Unlike drug trials, surgery is operator-dependent, and skill can affect the outcome of a randomized control trial.

Evidence-based medicine is expanding rapidly and surgery needs to keep pace. Though many trials have disproved the benefits of nasogastric tubes, drains, etc., surgeons are reluctant to change or embrace new ideas. They are more confident in the knowledge imparted during their training.

With this background, we decided to analyze the management of appendicular mass. Ochsner and Sherren, in 1901, nearly a century back, proposed an initial conservative management of an appendicular mass detected clinically. It was an era when antibiotics were confined to penicillin and technology was limited.

Acute appendicitis is one of the most common surgical emergencies and appendicular mass develops in 2-6% of cases following acute appendicitis.[1] Pathologically, this may represent a spectrum ranging from phlegmon to abscess. Although immediate surgical drainage is the treatment of choice for abscess formation, a number of treatment options are available for phlegmon. In spite of the availability of newer broad spectrum antibiotics, we still adhere to the age-old method of conservative management followed 6-12 weeks later by interval appendicectomy.

In this approach, initial conservative treatment obviates the risk of complications of surgery during the acute inflammatory phase,[2-7] whereas interval appendicectomy eliminates the possibility of recurrence.[8-11] However, other treatment options are also available. For example, early appendicectomy may eliminate the risk of complications that can arise between the resolution of the appendicular mass and definitive surgery and obviously reduces the need for second admission.[12-16] With the advent of laparoscopy, an increasing number of emergency appendicectomies are being performed even in the presence of appendicular mass. Some other surgeons recommend interval appendicectomy only if symptoms recur, since the risk of recurrence of appendicitis is low.[2-7] In view of the lack of adequate randomized clinical trials, the optimal treatment of patients with appendicular mass remains controversial.

In the present day of laparoscopy, we see many cases diagnosed as appendicitis, who actually have a mass defined by the localization of infection by the omentum. We still proceed with appendicectomy. A prospective randomized control trial was not feasible; hence, a retrospective study was done to analyze all cases of appendicular mass.

MATERIALS AND METHODS

In this retrospective study, data were collected from the medical records of 506 patients who underwent emergency appendicectomy from January 2005 through December 2007. All patients operated in our institute in the Departments of General Surgery, Surgical Gastroenterology and Pediatric Surgery were included in the study.

Eligibility criteria included all patients operated for appendicectomy for suspected acute appendicitis and appendicular mass (diagnosed clinically before or after anesthesia/radiologically/intra-operatively) by both open technique and laparoscopy. Patients with sub-acute or chronic appendicitis or appendicectomy done for other reasons/interval appendicectomy were excluded from the study.

The resulting 506 patients who could be evaluated were divided into two groups according to the presence or absence of mass. There were 114 patients with and 392 patients without mass. For our convenience, the patients without mass were used as controls and the patients with mass as cases for analytical purpose. The demographic characteristics between groups were comparable. All patients were followed until February 2008.

The following independent variables were analyzed: 1) sex (male vs female); 2) mass (present vs absent); 3) usage of drain; 4) antibiotics used; 5) postoperative complications (fever, wound infection, paralytic ileus, others); 6) histopathological findings; and 7) duration of stay. Multivariate analysis was done on the basis of the univariate analysis. The rates and ratios of this study were compared using the Pearson chi-square test. Probability values of $p<0.05$ were considered statistically significant. Odds ratio (OR) and 95% confidence interval (CI) were determined using the Kaplan-Meier estimator. Statistical analysis and graphics were performed using the SPSS statistical package.

RESULTS

A total of 506 patients with appendicitis were studied (240 males, 47.4%; 266 females, 52.6%). Appendicular mass was determined in 55 males and in 59 females, and the difference was not statistically significant. One hundred fourteen patients had mass while 392 patients did not (22.5% vs 77.5%), among which 15 patients had abscess formation (13.16%) (Table 1).

The usage of antibiotics was reviewed, which showed predominant usage of third generation cephalosporins (72%), with the remaining using quinolones (27%) and penicillins (1%), and all patients in addition had a metronidazole added.

The histopathological examination showed acute inflammation in 80.3%, eosinophilic appendicitis in

Table 1. Frequency of presence and absence of mass

Mass	Frequency	Percentage
Present	114	22.5
Absent	392	77.5

5.9%, lymphoid hyperplasia in 2.9%, and no evidence of inflammation in 5.4%. Among the remaining 4 patients, 1 had ileocecal tuberculosis 1 had mucinous tumor of the appendix, and 2 patients had adenocarcinoma cecum, 1 of whom had both adenocarcinoma cecum and ileocecal tuberculosis.

The postoperative complications were also studied in the two groups. In the whole study group, complications (fever, wound infection, paralytic ileus, etc.) were determined in 24 (4.7%) patients (12 in each group) (Tables 2, 3), and the difference between groups was significant (OR: 3.725, p=0.001) (Table 2).

A comparison of wound infection in the two groups revealed infection in 2 patients in the group with mass and in 5 patients in the group without mass (Table 1, 4), and the difference was not significant (OR: 1.49, p=0.634) (Table 2).

The usage of drains was also studied. In total, 47 (9.3%) patients used drains (Table 2). As seen in the Table, drains were used in 37 patients in the group with mass and in 10 patients in the group without mass, and the difference between groups was highly significant (OR: 18.35, p<0.001 with chi-square test).

The average total leukocyte counts in the two groups showed a mean of 13408.57 vs 13871.81, respectively, and the difference was not statistically significant (p=0.886) (Table 4). The average duration of stay was 5.912 and 5.352 in the groups with and without mass, respectively, and the difference between groups was also not significant (p=0.44) (Table 4).

DISCUSSION

Acute appendicitis is one of the most common surgical emergencies throughout the world and the incidence of appendicular mass is on the rise. The diagnosis of these conditions is primarily clinical supplemented with imaging modalities in special situations. The management of appendicular mass is controversial, although theoretically most surgeons would advocate the age-old method of conservative management, i.e. bedrest, antibiotics and intravenous fluids.[2-11]

Although early appendicectomy was proposed back in 1976 by Vakili et al.[15] followed by a few small series trials favoring it, conservative management continues to be the order of the day. With the availability of laparoscopy, more cases of appendicular mass are being taken up for early appendicectomy. Antibiotic spectrum available today is far superior when compared to the era of Ochsner-Sherren, when even penicillin was not available.

In this retrospective trial, we attempted to determine the role of early appendicectomy (both open technique and laparoscopy) in patients with appendicular mass, and we tried to compare with patients without mass, which was not done in most of the previous series. It was beyond the scope of this study to compare open surgery and laparoscopy, since the operator experience was varied. We primarily aimed to compare the safety and efficacy and incidence of complications in patients undergoing early appendicectomy, who presented with a mass. We also wanted to justify emergency appendicectomy in all cases of appendicular mass.

As seen in Table 1, the incidence of appendicular mass in our series was 22.5%, with incidence of abscess of 13% among the patients with mass. Early appendicectomy was performed in these patients and

Table 2. Incidence of postoperative complications, postoperative wound infection and usage of drains and their corresponding odds ratios

		Mass present	Mass absent	Odds ratio	p
Postoperative complications	Present	12	12	3.725	0.001
	Absent	102	380		
Postoperative wound infection	Present	2	5	1.490	0.634
	Absent	112	387		
Usage of drains	Present	37	10	18.35	p<0.001
	Absent	77	382		

Table 3. Frequency of various postoperative complications

Mass	Fever	Wound infection	Paralytic ileus	Others	None	Total
Present	7	2	1	2	102	114
Absent	4	5	0	3	380	392
Total	11	7	1	5	482	506

Table 4. Comparison of total counts and duration of stay between the two groups

		N	Mean	SD	p
Total count	Mass Present	35	13408.57	4330.084	
	Mass Absent	149	13871.81	18964.056	0.886
	Total	184	13783.70	17157.198	
Duration of stay	Mass Present	114	5.9123	2.55059	
	Mass Absent	392	5.3529	2.61519	0.044
	Total	506	5.4792	2.60876	

they were followed to monitor any early or late complications.

Although there was a statistically significant increased usage of drains in the group with mass (OR: 18.35, $p<0.001$) and a significantly increased duration of stay, there was no incidence of fecal fistula or any other major complication in either group.

There was a significantly increased incidence of minor complications in the group with mass (fever, paralytic ileus, wound infection, etc.) (OR: 3.725, $p=0.001$). If wound infection was considered alone, there was no significant difference between the two groups ($p=0.634$). Furthermore, the total leukocyte count did not show any difference between the two groups ($p=0.886$).

Six patients suspected as having appendicular mass on diagnostic laparoscopy had abnormal findings apart from the mass (peritoneal tubercles, lymphadenopathy, cecal mass, ileal wall thickening), of which, 4 were determined as abdominal tuberculosis, 1 as adenocarcinoma cecum and 1 as both ileocecal tuberculosis and adenocarcinoma cecum. The patient with mucinous tumor had no suspicious intra-operative findings.

A few recent series have mentioned the concept of conservative management for appendicular mass without the need of further interval appendicectomy 2-7, which clearly would not hold true in a country like India, where the incidence of tuberculosis is very high as noted above, and which if missed could lead to highly morbid consequences.

With the advent of human immunodeficiency virus, more and more cases of abdominal tuberculosis are being seen in our clinical practice. Conservative management with initially a non-operative approach would definitely imply that a subset of the population would go undiagnosed. Hence, even though our study is retrospective, based on this small series, we would not recommend non-operative management of appendicular mass.

In conclusion, considering the above-mentioned results, it can be said that emergency appendicectomy can be safely advocated, using either open or laparoscopic approach depending of the expertise of the surgeon. Advantages of this approach are its low morbidity, reduced hospital stay, low cost, and patient compliance and elimination of the fear of missing conditions like tuberculosis, especially in a country like India, although at the expense of the slightly increased duration of hospital stay.

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