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Original Article

Emergency Right Hemicolectomy for Pericecal Masses Mimicking Acute Appendicitis: Surgeon's Fearful Dilemma

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ABSTRACT

Objective: Unexpected conglomerated pericecal masses of uncertain etiology encountered in emergency surgery may be indistinguishable, and proper operative strategic management of these cases is a dilemma for digestive system surgeons. Starting from this point, we decided to analyze the patients in whom a right hemicolectomy was performed for the pericecal mass during an appendectomy in our regional hospital.

Methods: Over 8 years between March 2011 and May 2019, 4783 patients who lived in the eastern Mediterranean area underwent emergency surgery for clinical diagnosis of acute appendicitis, and a right hemicolectomy for inflammatory pericecal mass was performed in 44 patients included in this study. Patient records were reviewed for sex, age, preoperative symptoms, preoperative imaging, operation findings, preoperative Complete Blood Count (CBC) and biochemical findings, pathology reports, length of hospital stay, mortality, and any complications encountered.

Results: The histopathological examination revealed that 5 of 44 (11.4%) patients had malignancy while 27 of 44 patients (88.6%) had benign pathologies. All of the malignancies were adenocarcinoma. According to age, there was a statistically significant difference between patients with and without malignancy ($P < .05$).

Conclusion: The pericecal mass in emergency surgery is still a diagnostic and therapeutic dilemma. Hidden appendiceal neoplasm in acute appendicitis is rare but its incidence is higher in patients presenting appendiceal inflammatory mass. On the other hand, most unexpected inflammatory pericecal masses are due to benign pathologies. The choice of the surgical procedure depends on the surgeon's and institute's experience.

Keywords: Appendicitis, cancer, hemicolectomy, pericecal mass

INTRODUCTION

Acute appendicitis is one of the most common gastrointestinal system surgical emergencies worldwide without any doubt.[1] A total of 88% of emergency surgical admissions that require surgery are cases of appendicitis.[2,3] Geographical differences are reported with lifetime risks for appendicitis of 16% in South Korea, 9% in the USA, and 1.8% in Africa.[4,5] Although it is a common disease, obtaining a confident preoperative diagnosis is still a challenge, especially in the elderly population. The unexpected pericecal mass with uncertain etiology occasionally encountered by the surgeon during appendectomy may cause a therapeutic dilemma. The appendiceal mass is generally the result of a walled-off inflammation or infection and represents a pathological spectrum ranging from pericecal phlegmon and abscess to conglomerated solid mass.[6] Various diseases involving the ileocecal region cause pericecal mass, such as severe appendicitis, inflammatory bowel disease, diverticular disease, and malignancy.[7,8] Because benign pericecal masses or cancers can mimic acute appendicitis, sometimes during the operation, the surgeons cannot virtually distinguish the pathology. So, the surgeons are often challenged to determine the pathologic origin of masses.[8] In these circumstances, emergency surgery is associated with a risk of ileocaecal resection or right hemicolectomy. Many reports in the literature have addressed this promiscuousness, and right hemicolectomy has been recommended because of possible malignancy. Most of the limited number of studies were carried out to evaluate the pathologies and surgical management of the pericecal masses in patients with suspected appendicitis.[9-11]

From the above-mentıoned starting points, we decided to analyze the patients retrospectively to present the diversity of the inflammatory pericecal masses in patients with right hemicolectomy

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was performed for the pericecal mass that was detected during an appendectomy for acute appendicitis in our clinic.

METHODS

Ethics

This study was carried out with the permission of the Adana City Training and Research Hospital Ethics Committee (Date: May 22, 2019, Decision No: 446) and has therefore been performed following the ethical standards in the Declaration of Helsinki.

Study Design

In this study, we retrospectively evaluated 4783 patients who underwent emergency surgery for acute appendicitis between March 2011 and May 2019 at the Department of Surgery, Adana City Training and Research Hospital. Forty-four patients who had right-hemicolectomy for inflammatory cecal masses of uncertain etiology were included in our study. The patients who had suspicious or proven for pericecal malignancy preoperatively by the physical, radiological examination, or biopsy were excluded from the study. Patient records were used to identify sex and age. The records were also reviewed, especially for preoperative symptoms, preoperative imaging, operation findings, pre-and postoperative Complete Blood Count (CBC) and biochemical findings, pathology reports, length of hospital stay, mortality, and any complications encountered.

Surgical Technique

Right-hemicolectomy was performed as formal resection of the right colon, including lymphatic drainage along the ileocolic and right colic arteries. If possible, an anastomosis was made by linear stapler or hand saving due to surgeons' preference.

Postoperative Follow-Up

All patients were administered prophylactic antibiotics at induction, and antibiotic treatment was proceeded until postoperative day 3 if there was no severe or mild infective complication. Patients were discharged with a 1-week course of 500-mg paracetamol 3 times daily with suture removal after 1 week. The outpatient consultation was arranged at postoperative month 1 firstly, and postoperative month 3 secondly.

Statistical Analyses

The statistical analyses were performed using Statistical Package for the Social Sciences version 25.0 (SPSS Inc., Chicago, Ill, USA). Chi-square statistical analyses were used for nominal data. The ordinal data and non-parametric numerical data of malignant and non-malignant groups were previously tested for normality by the Shapiro–Wilk test independent samples *t*-test, Mann–Whitney *U* test was used. A *P* value <.05 was considered statistically significant.

Main Points

- The pericecal mass in emergency surgery is a diagnostic and therapeutic dilemma.
- Most of the unexpected inflammatory pericecal masses are due to benign pathologies.
- Malignancy was detected in 11.4% of the patients who were suspected of malignancy due to pericecal mass and who underwent right hemicolectomy.
- When the groups with and without malignancy were compared, age was the major risk factor for malignancy.

RESULTS

Patients and Symptoms

Totally 44 patients underwent a right hemicolectomy procedure; 28 (63.6%) of them were male, whereas 16 (36.4%) were female. The patients included in this study were between the ages of 21 and 86 (mean: 49.59).

Twenty-three of 44 patients had Ultrasonografi (USG) and 25 of 44 had computed tomography (CT) scannings before the surgery. The radiologic examination did not determine whether the processes were malignant or inflammatory (Table 1).

Distribution of Pathologies

All specimens resected were sent to pathologic examination. The histopathologic examination revealed that 5 (11.4%) patients had malignancy while 39 (88.6%) patients had benign pathologies. All of the malignancies were adenocarcinoma. On the other hand, the benign histopathologic diagnosis was perforated plastron appendicitis (n = 22), inflammatory bowel disease (n = 4), cecal diverticulitis (n = 3), mucinous cystadenoma (n = 3), nonspecific active colitis (n = 2), vasculitis (n = 2), tuberculosis (n = 2), and mesenteric fibromatosis (n = 1). The distribution of pathologies showed in Table 2. When malignant and benign groups are compared. According to age, there was a statistically significant difference between patients with and without malignancy ($P < .05$).

Biochemical Tests

There was no statistically significant difference with respect to preoperative blood tests such as white blood cell count (WBC), hemoglobin (Hgb), C reactive protein (CRP), aspartate aminotransferase (AST), and amylase between in patients with and without malignancy ($P > .05$) (Table 3).

Table 1. Preoperative Radiologic Scannings

	n	%
USG		
No pathologic findings	11	25
Acute appendicitis	5	11.4
Complicated appendicitis	7	15.9
Not performed	21	47.7
CT		
No pathologic findings	5	11.4
Acute appendicitis	6	13.6
Complicated appendicitis	14	31,8
Not performed	19	43.2

CT, computed tomography.

Table 2. The Pathologies in Patients

Pathologies	n	%
Perforated plastron appendicitis	22	50
Inflammatory bowel disease	4	9.1
Cecal diverticulitis	3	6.8
Mucinous cystadenoma	3	6.8
Non–specific active colitis	2	4.5
Vasculitis	2	4.5
Tuberculosis	2	4.5
Mesenteric fibromatosis	1	2,3
Adenocarcinoma	5	11,4

Postoperative Follow-Up

The mean length of hospital stay is 9.7 days (5-22 days). The mortality rate was 6.8% (3/44) due to severe comorbidities of the patients and being very elderly. The pathologies detected in 2 of them were benign, whereas the other was a malignant disease.

DISCUSSION

Right lower quadrant abdominal pain is a common presenting symptom in the emergency department. This entity can result from a broad spectrum of conditions, ranging from self-limiting to requiring emergency surgery.[7] Sometimes, inflammatory pericecal masses or cancers may mimic acute appendicitis, and during the operation, the surgeon may not distinguish the pathology.[8] An unexpected conglomerated mass at the ileocecal region may cause a therapeutic dilemma since various diseases involving the ileocaecal region causes pericecal mass, such as perforated appendicitis, inflammatory bowel disease, diverticular disease, and malignancy.[8]

The surgical strategy generally depends on the pathology. On the other hand, it is not always possible to know or predict the nature of the disease, if it is benign or malignant. In daily surgical and emergency settings, the surgeons may not exclude the malignancy, and a radical resection may be necessary.[12-15] A recent questionnaire study performed by Ahmad I et al[9] showed no agreed consensus on the management of appendicecal mass in the Mid-Trent region of England. In the present study, except for a young patient, all of the patients underwent a right hemicolectomy since this is a reasonable procedure in our clinic if the surgeon could not exclude the malignancy. Our study showed that only 11.4% of the patients had malignancy, and the pathology in most of the patients (88.6%) was reported as benign. All specimens resected were sent to pathologic examination. The histopathologic examination revealed that 5 (11.4%) patients had malignancy while 39 (88.6%) patients had benign pathologies. All of the malignancies were adenocarcinoma. The most detected benign histopathologic diagnosis was perforated plastron appendicitis (n = 22, 50%), while inflammatory bowel disease, cecal diverticulitis, mucinous cystadenoma, non-specific active colitis, vasculitis, tuberculosis, and mesenteric fibromatosis were the other benign pathologies detected. When malignant and benign groups are compared. According to age, there was a statistically significant difference between patients with and without malignancy ($P < .05$). Age was an independent factor for malignant pericecal mass. This result is not surprising, so the surgeons should keep a malignancy risk in their minds in elderly patients with periceacal mass.

In the emergency department, ultrasonography (US) is the first choice for investigating the etiology of acute abdominal pain. The diagnostic accuracy of US in patients with right lower quadrant pain is reported as 72%, whereas the CT has a higher diagnostic rate.[14,15] Despite the increased use of CT to evaluate acute appendicitis and diagnose periceacal mass, the number of perforated and complicated cases has been stable in the past 3 decades.[12] In our study, the diagnostic rate of the US was 78.1% while 93.7% for CT. According to our experiences, CT is more accurate to diagnose the pericecal mass but not for distinguishing a benign pathology from a malignancy. There were no statistically significant differences with respect to preoperative serum levels of WBC, Hgb, CRP, AST, and amylase between patients with and without malignancy ($P > .05$).

Table 3. The patients features with and without malignancy

	Malignant (mean)	SD	Benign (mean)	SD	*P*
Age	68.2	±17.21	47.20	±14.17	**.004***
WBC (10^3/μL)	13.36	±4.62	13.14	±4.91	.590**
Hb (g/dL)	11	±1.43	12.62	±1.97	.600*
CRP (mg/dL)	22.17	±14.52	25.12	±23.65	.852**
AST (μ/L)	38	±22.42	27	±14.65	.144*
Total bilirubin	0.6	±0.42	0.23	±0.63	.128**
Amylase (μ/L)	49	±26.62	58.98	±44.01	.914**

*Student *t*–test.
**Mann–Whitney *U* test.
WBC, white blood cell; Hb, hemoglobin; CRP, C–reactive protein; AST, aspartate aminotransferase.

The mortality rate of emergency right hemicolectomy varied between 6% and 10% in previous studies.[10-13] In this study, concomitant respiratory and cardiac failure and elderly age were the main reasons for mortalities. The mortality rate was 6.8% in our study, and it was similar to the literature

Although our study gives valuable information about the subject, our study has some limitations. This study was conducted on a group of patients retrospectively who are living in the Mediterranean region. Additionally, the patients were operated on in a single institute. Therefore, for the generalizatıon of our results, further clinical studies with a high number of cases are needed.

CONCLUSION

In conclusion, pericecal mass in emergency surgery is still a diagnostic dilemma. Hidden appendiceal neoplasm in acute appendicitis is rare, fortunately. However, its incidence is much higher in patients presenting appendiceal inflammatory mass. On the other hand, most unexpected inflammatory and conglomerated pericecal masses are due to benign pathologies. The choice of the surgical procedure depends on the surgeon's and institute's experience, and further prospective researches are needed on this topic.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Adana City Training and Research Hospital, (Date: May 22, 2019, Decision no: 35/446).

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

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