Original Article

South Coast appendicular mass management (SCAM) survey

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Background: Management of appendicular mass and interval appendicectomy remains a controversial issue. Recent publication of a randomized controlled trial (RCT) reported the incidence of around 20% neoplastic lesions in the age group of more than forty years among the interval appendicectomy group against magnetic resonance imaging (MRI) surveillance only which led to trial termination. The objective of this study is to evaluate the current practice of the management of appendicular mass in five major hospitals of South Coast of the England.

Methods: A proforma was designed and emailed to the general surgical department of five hospitals in the South Coast of England. The proforma completion rate and compliance were improved by direct telephone call to the on-call registrars and consultants to collect data.

Results: Fifty-three surgeons (22 consultants, 27 ST3–ST8 grade surgical trainees and 4 SAS grades) completed the proforma. The clinical, hematological and computerized tomography (CT) based diagnostic criteria, and in-patient intravenous antibiotics (IV ABTXs) in addition to the radiological drainage in amenable cases for appendicular mass/abscess were mostly agreed initial management plan among surgeons. Normalization of inflammatory markers and radiological resolution were agreed discharge indicators. Agreed follow up investigations were CT scan (by 23%), Colonoscopy (by 13%), and both CT and colonoscopy (by 57%) after discharging patients. Only 17% surgeons offered planned interval appendicectomy and 62% surgeons offered interval appendectomy in selective cases of appendicular mass within 6 weeks to 6 months after discharge.

Conclusions: South Coast appendicular mass management (SCAM) survey confirms diverse practice to manage appendicular mass/abscess among surgeons working in South Coast hospitals. A substantial percentage of surgeons do not offer interval appendectomy to patients potentially leaving neoplastic lesions *in situ*.

Keywords: Appendicitis; appendicectomy; appendicular mass; appendicular abscess

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Introduction

Acute appendicitis is one of the most common acute surgical conditions. The defense mechanism of the patient's body may control the acute situation by forming an inflammatory mass (an appendiceal phlegmon) or a confined abscess, often presenting as a palpable, tender mass usually 5 to 7 days following the onset of symptoms (1,2). Mass formation occurs in 2% to 7% of all cases of acute appendicitis (1,2).

The management of appendicular mass is still controversial despite several innovative diagnostic and operative interventions in the field of emergency surgery. Urgent appendicectomy may be technically difficult because of the distorted anatomy and tissue friability. Sometimes the resulting procedure is either ileocecal resection or even a right hemicolectomy because appendicular mass is mimicking a neoplastic growth (3). Conservative management of appendicular mass has been facilitated by improved imaging techniques and image-guided therapeutic intervention with the help of computerized tomography (CT) and ultrasonography (4). Newer antibiotics have also catalyzed nonsurgical treatment (5). Though, the third option of conservative management with interval appendectomy has traditionally remained the gold standard management, necessity of interval appendicectomy has always been questioned as the risk of recurrence is relatively small and increased health burden issue (6). Interestingly, one recent randomized controlled trial (RCT) from Finland showed the alarmingly increased incidence of appendicular neoplasm (overall 20%) following interval appendicectomy in the age group of more than forty years which prompted a premature termination of the study (7).

The ongoing debate in the management plan of appendicular mass has prompted the authors to conduct this study to search the most commonly practiced approach among the senior surgeons in the hospitals at South Coast of England named as South Coast appendicular mass management (SCAM) survey.

Methods

Following the recent publication of a RCT (7) advocating the need of interval appendectomy in patients presenting with appendicular mass due to an alarming incidence of neoplastic lesions on histopathological examination of resected appendix among patients with the age of more than forty years, the idea of SCAM survey was conceived and discussed in the departmental clinical governance meeting. A proforma (*Figure 1*) was prepared by four consultants and one senior surgical registrar with main headings focusing on "diagnostic criteria", "initial management pathway", "intervention radiological drainage", "discharge criteria", "follow up investigation", "interval appendicectomy", "time interval for interval appendicectomy", "chase up for histopathology report of the specimen" and "other comments". We collected the data by e-mailing the proforma to surgical consultants, surgical trainees of registrar grade and staff grade surgeons. Data was also collected by direct phone calls to relevant surgeons, to improve the response rate. The data from completed proforma was transferred to the Microsoft Excel sheet. Data analysis and interpretation were performed by two authors (Muhammad S. Sajid and Kausik Ray).

Results

Fifty-three surgeons [22 consultants, 27 senior surgical specialty trainees (ST3–ST8) and 4 staff grade surgeons] completed the proforma. Nineteen out of 53 (36%) participants agreed clinical, hematological and CT based diagnostic criteria at the initial stage whereas 27 surgeons (51%) suggested clinical examination followed by CT scan. For initial management, around 58% participants (31/53) offered intravenous fluids (IVF) and antibiotics (ABTXs) and around 6% (3/53) suggested radiology-assisted drainage in addition to this. Thirty-two percent (17/53) surgeons offered suggested appendicectomy 4% (2/53) surgeons proceeded for diagnostic laparoscopy (*Figure 2*) to assess whether appendectomy is doable. Regarding interventional radiological drainage, 55% (29/53) surgeons recommended this in the presence of appendicular abscess on CT scan, whereas 17% surgeons (9/53) offered it to the systemically unwell patient only. Approximately two-third of the surgeons (34/53) reported clinical examination and normalization of inflammatory markers as discharge criteria but 26% surgeons (14/53) preferred to perform a repeat CT scan to confirm the complete resolution of appendicular abscess prior to the discharge. Normal practice for follow up investigations was CT scan by 23% (12/53) surgeons, colonoscopy by 13% (7/53) surgeons, combined CT scan and colonoscopy by 57% (30/53) surgeons and approximately 8% (4/53) surgeons did not arrange any investigation after discharging the patients (*Figure 3*).

SCAM survey: South Coast appendicular mass management survey
Please encircle your choice

Diagnostic criteria	Clinical exam	High WBC, CRP	US	CT
Primary management	Appendectomy	IV ABTX, IVF	Other	
Radiological drainage	Indication?			
Discharge criteria	Clinical	Bloods	CT	US
FU investigation	CT	Colonoscopy	Both	None
Interval appendectomy	Yes	No	Selective	
Time for interval appendectomy	3/12	Other?		
Ever chased histopathology	Yes	No	Selective	
Any other comments				

Grade:

Figure 1 SCAM survey proforma. SCAM, South Coast appendicular mass management; WBC, white blood cell; CRP, C-reactive protein; US, ultrasound; FU, follow up; CT, computerized tomography; IV ABTX, intravenous antibiotic; IVF, intravenous fluid.

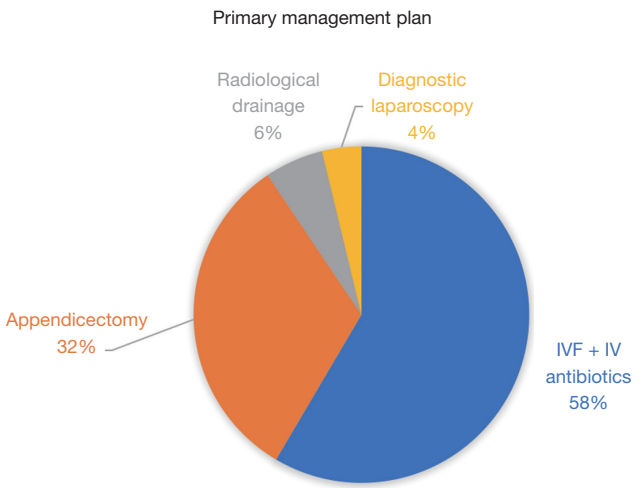

Figure 2 Primary management plan. IVF, intravenous fluid.

Only 17% (9/53) surgeons offered routine interval appendicectomy and 62% (33/53) offered interval appendicectomy in selective cases of appendicular mass within 6 weeks to 6 months after discharge from the index admission. Eight surgeons (15%) did not offer interval appendicectomy to patients admitted with appendicular mass (*Figure 4*). When asked about chasing the histopathology report of specimen following operative intervention, 75% (40/53) answered 'yes' and around 11% (6/53) answered in selective cases. Rest of the participants answered 'no'.

Discussion

Brief conclusions

Based upon the findings of this study, the SCAM survey confirms the diverse practice to manage appendicular mass/abscess among surgeons working in South Coast hospitals of England. A substantial percentage of surgeons do not offer interval appendicectomy to patients potentially leaving appendicular and/or caecal neoplastic lesions *in situ*, the issue raised by a recently published RCT (7).

Strength of current evidence

This study was prompted by the publication of RCT (7) highlighting the need of change of practice towards the recommendation of routine interval appendicectomy in all patients with appendicular mass/abscess following the successful conservative management. This study successfully highlighted the need of change of practice among surgical fraternity in the management of appendicular mass/abscess.

Comparison with previous evidence

To this date, SCAM survey is the first ever study highlighting the diverse practice of the management of appendicular mass in England. Previously published studies have reported same sort of diverse practice highlighting the need of change of practice and reported the risk of

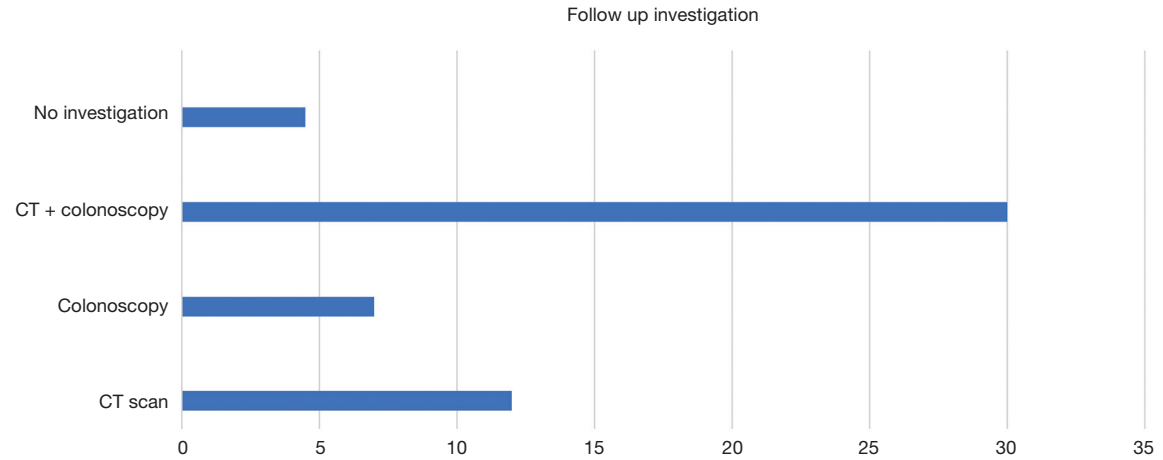

Figure 3 Follow up investigation after primary management. CT, computerized tomography.

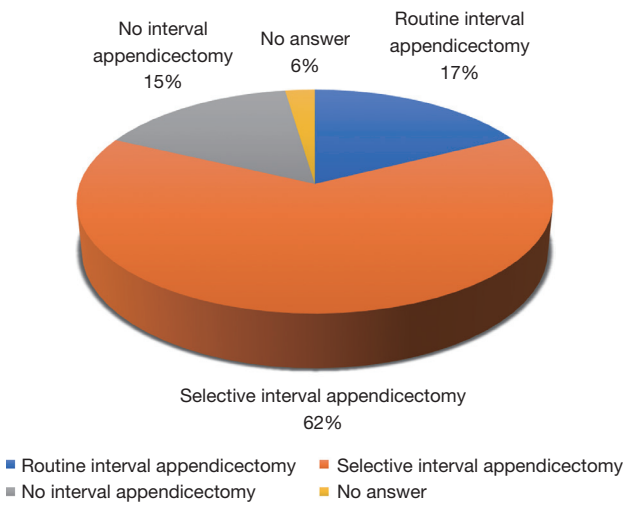

Figure 4 Incidence of interval appendicectomy.

appendiceal neoplasia up to 30% in patients undergoing interval appendicectomy (8-11).

Acknowledgments

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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