Towards an evidence-based management of right iliac fossa pain in the over 50-year-old patient

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ABSTRACT

INTRODUCTION Right iliac fossa pain is a common presenting complaint to general surgery. The differential diagnosis is wide, particularly in the elderly. Computed tomography (CT) is often used in the 'older' population, as they have a higher prevalence of acute colonic diverticulitis and colonic neoplasia, both of which should be identified prior to surgery. There is, however, no published evidence to support this practice.

METHODS We retrospectively reviewed the records of all patients aged over 50 years who presented with right iliac fossa (RIF) pain to a district general hospital. We determined whether tenderness was predominantly right- or left-sided and whether systemic inflammatory response syndrome (SIRS) was present on admission. The use of imaging modalities, their results and, if performed, operative findings were recorded.

RESULTS Of 3160 patients identified, 89 met the inclusion criteria. Diagnoses included appendicitis (27%), neoplasia (15%), non-specific abdominal pain (15%) and acute colonic diverticulitis (10%). CT was performed in 82% of patients, with a sensitivity of 97% based on operative findings. Six patients underwent surgery without a scan, two of whom required a change in the planned procedure due to unexpected findings.

CONCLUSIONS Unless contraindicated, CT scanning should be mandatory in patients aged over 50 years presenting with signs of peritonism in the RIF or lower abdomen.

KEYWORDS

Right iliac fossa pain – Elderly – Over 50s – Computed tomography – Appendicitis – Diverticulitis

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Right iliac fossa (RIF) pain is a common acute surgical presentation in the United Kingdom.¹ Although the majority of patients will be aged between 10 and 40 years, a significant proportion is aged over 50 years. In the younger cohort, the patient history, examination, physiological parameters and blood tests will guide whether surgical intervention is warranted. The commonest cause in this cohort is acute appendicitis, with an annual incidence of 11 per 10,000 of the population.^{2–4} In females, a trans-abdominal and/or trans-vaginal ultrasound (US) is a common adjunct to rule out gynaecological causes.⁵ In this younger cohort, the differential diagnosis is broad but, importantly, the symptoms are unlikely to represent malignancy or acute colonic diverticulitis. In the presence of peritonism and evidence of sepsis (and no obvious gynaecological cause on US for female patients), routine practice is to perform laparoscopy and proceed to appendectomy, if no other cause for the symptoms is identified.¹

In 2014, The Royal College of Surgeons of England produced a commissioning guide on the management of acute abdominal pain, in collaboration with the Association of Surgeons of Great Britain and Ireland.¹ This document defines

'elderly' to mean patients aged over 50 years. It makes the distinction on the grounds that the incidence of certain pathologies is higher in this cohort, in particular acute colonic diverticulitis and malignancy.

The incidence of diverticular disease in the over 50s is between 20% and 60%.⁶ Ten per cent to 25% of these will develop acute complications, such as diverticulitis or bleeding.⁷ 'Right-sided' diverticular disease can be caused by diverticulae of the right colon or of a mobile sigmoid colon. The former is less common and has an associated genetic predisposition. The precise prevalence of the latter is unknown.

The incidence of colorectal malignancy rises sharply at 50 years of age, with a prevalence per 100,000 of the population of 46 in males and 36 in females. A quarter of these affect the right colon.⁸ Although most of these lesions will present insidiously with a change in bowel habit or anaemia, a proportion will present with acute obstruction or perforation.

If a patient presents with acute RIF or lower abdominal pain, but has acute colonic diverticulitis or colorectal neoplasia, emergency laparoscopy may be inappropriate and could potentially do more harm than good. Anecdotally, many

surgeons would therefore advocate performing a computed tomography (CT) scan for any older patient presenting acutely with RIF or lower abdominal pain and peritonism to guide management, aid in planning and consenting for surgery, and potentially even avoid surgery altogether. As a result, there is a huge intra-hospital difference in the management of this cohort.⁹ The aforementioned commissioning guide states:¹ “In patients over the age of 50 presenting with abdominal pain but no sepsis, CT (either on an inpatient or early outpatient basis) is advisable, due to the risk of occult malignancy in this group”. It goes on to say that there should be a “lower threshold for CT imaging in the elderly”. Notably, no references were cited to validate either of these assertions.

The aim of this paper was to investigate the incidence and variety of causes for right-sided lower abdominal pain in the population aged over 50 years and subsequently assess the use of CT. To achieve this, we conducted a retrospective study of all patients aged over 50 years presenting to the general surgical department of district general hospital with RIF abdominal pain.

Methods

The project was registered at the audit department of Buckinghamshire Healthcare NHS Trust, under reference number 4751.

All patients admitted to the acute general surgical take in Stoke Mandeville Hospital between July 2014 and July 2015 were identified, yielding a total of 3160 patients. From this group, all those aged over 50 years at the time of admission were selected. Within this cohort, the notes of all patients coded with abdominal pain were reviewed, and those with pain in the RIF or left iliac fossa (LIF) or who had generalised lower abdomen were included.

For each patient, the age, sex and length of stay was recorded. The predominant site of tenderness was established from the documented senior surgical assessment (by a Specialty Registrar or above) and classified as one or more of RIF, lower abdominal or LIF pain.

It was established whether the patient met any systemic inflammatory response syndrome (SIRS) criteria on admission, which were: respiratory rate >20 breaths per minute; pulse >90 beats per minute; temperature <36.0°C or >38.0°C; or white cell count <4 or >12 × 10⁹ cells/L. A diagnosis of SIRS required the presence of ≥2 criteria. Imaging for each patient was reviewed and US or CT reports were recorded. Finally, it was determined whether patients underwent surgery, and the operative findings, and whether these matched with the available histopathology, were recorded.

Results

Two hundred and ten patients aged over 50 years with lower abdominal pain were identified, of whom 89 had predominant RIF tenderness (Table 1). Of these, 72 underwent a CT scan (82%) and two (2%) an US. Thirty-three of 89 (38%) patients underwent surgery. Of these, six did not have a pre-operative CT (one patient had an US), and all six underwent laparoscopy. Interestingly, two of these patients required a

change to the operative plan: one had part of the caecum resected for a ‘soft mass’, which proved to be benign, and one required gynaecological input for bilateral calcified cystic lesions of the ovaries.

Table 2 lists the discharge diagnoses in order of prevalence. Acute appendicitis was the commonest diagnosis (27%). Colonic cancer and acute colonic diverticulitis had a combined incidence of 25%. Thirteen patients (15%) were discharged with a diagnosis of non-specific abdominal pain, seven of whom had a CT scan. The six patients who did not

Table 1 Patient demographics for RIF patients

Number of patients	89
Age, range (mean)	50–93 (65)
Male:Female	40:49
CT performed, n (%)	72 (81%)
SIRS, n (%)	13 (15%)
LOS, range (mean)	0–37 (4.3)
CT = computed tomography; LOS = length of hospital stay; SIRS = systemic inflammatory response syndrome	

Table 2 Diagnosis, in order of incidence

Diagnosis	Number	SIRS
Acute appendicitis	24	6
Neoplasia (Total)	13	2
Ascending colon	5	1
Caecum	4	1
Gynaecological	3	0
Unknown primary	1	0
Non specific abdominal pain	13	1
Acute colonic diverticulitis	9	2
Renal colic	5	1
Colitis	4	0
Urinary tract infection (inc. pyelonephritis)	3	0
Acute cholecystitis	3	1
Constipation	3	0
Small bowel obstruction	3	0
Appendix mass (inc mucocoele)	3	0
Right incarcerated inguinal hernia	2	0
Rectus sheath haematoma	1	0
Leaking abdominal aortic aneurysm	1	0
Omental infarction	1	0

have a scan were seen in outpatients or asked to be reviewed by their general practitioner. To date, none have had a formal diagnosis. A comparison of operative findings to those reported by the radiologist indicated that CT had a 97% accuracy in the diagnosis of RIF pain. Only one scan led to a negative laparoscopy.

Thirteen patients, or 15% of the RIF cohort, met the criteria for SIRS on admission (Figure 1). They had a mean age of 63 years (range 50–93 years), which was not different from that for the overall cohort. Imaging or surgery identified an infectious cause for SIRS in 10 patients. The three remaining patients did not have an infective cause. In contrast, 73% of patients with an infective diagnosis (eg diverticulitis) did not meet the criteria for SIRS.

Discussion

This study is the first to formally assess the incidence and causes of right-sided lower abdominal pain in the over-50 population. Our data show that the differential diagnosis in this cohort is broad. In many instances, surgical intervention would have been inappropriate (eg for rectus sheath haematoma) or an unpleasant surprise for the operating surgeon (eg a leaking abdominal aortic aneurysm). Acute appendicitis, neoplasia and acute colonic diverticulitis were the most common diagnoses. The relatively high incidence of neoplasia and acute colonic diverticulitis was surprising.

Undoubtedly, all three conditions may warrant surgical intervention, although 90% of acute colonic diverticulitis is

managed non-operatively,¹⁰ and some clinicians even advocate the sole use of antibiotics for the treatment of uncomplicated acute appendicitis.¹¹ The key is that preoperative diagnosis with CT is helpful in deciding whether, when and how to operate. CT has a sensitivity of up to 99% for acute colonic diverticulitis,¹² and up to 90% for acute appendicitis.¹³ The sensitivity of abdominal CT of the pelvis with intravenous contrast to detect colorectal neoplasia is around 70%.¹⁴ This needs to be taken into account when interpreting the results and, in the context of the history and examination findings, an outpatient colonoscopy or virtual colonoscopy should be considered. Although the sensitivity of CT was 97%, this was based on operative findings and we must entertain the idea that CT diagnoses not requiring surgery may not have carried as high a sensitivity.

Another important observation of this study is the relatively low number of patients that met SIRS criteria on admission. The presence or absence of SIRS is commonly relied on for differential diagnosis. Indeed, the commissioning guide's statement that "in patients over the age of 50 presenting with abdominal pain but no sepsis, CT is advisable due to the risk of occult malignancy"¹ has two primary implications: that malignancy commonly presents without SIRS; and that infective causes present with sepsis. In our cohort, the incidence of SIRS of 15% is low, especially considering that 46% had a true infective cause, such as acute appendicitis, acute colonic diverticulitis, urinary tract infection or cholecystitis. The low incidence in our cohort may reflect a reduction in SIRS response in the elderly population.¹⁵ This makes early diagnosis even more important, as rapid deterioration may ensue.

Although CT has proven to be a crucial part of the initial investigation of lower abdominal pain in the over-50s, consideration must given to its risks. First, the risk of acute kidney injury is reported to be as high as 5%.¹⁶ The second risk is that of radiation exposure, as it has been proposed that 0.2%–2% of all cancers are a direct consequence of radiation exposure during CT.^{17,18} Lastly, the approximate cost of a CT of the abdomen and pelvis, with contrast, is £130.¹⁹

Conclusions

This is the first study to formally assess the value of CT in patients aged over 50 years. The commonest pathology in this age group is indeed acute appendicitis, but neoplasia and acute colonic diverticulitis, in combination, make up the same proportion of the diagnoses. The use of CT therefore altered the management of a significant proportion of the cohort. Furthermore, the inherent reliance on SIRS criteria to distinguish between infective and non-infective causes

appears to be less reliable in this age group. Our data shows that the anecdotal practice of performing a CT scan prior to surgery is entirely appropriate and should be routine practice, unless contraindicated.

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