SHORT REPORT

Missed Opportunities for the Detection of Abdominal Aortic Aneurysms

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Objective. To determine whether patients attending as emergencies with ruptured AAA could have been detected opportunistically prior to rupture.

Design. Retrospective analysis.

Methods. The notes of patients attending hospital with ruptured abdominal aortic aneurysms to four City and DGH hospital in the West of Scotland were examined for previous assessments or investigations with the potential to discover an AAA.

Results. In this series 77% of patients were not previously known to have and AAA. Of these patients 76% had been reviewed in hospital during the preceding 5 years on a combined total of 355 occasions. 56% of patients had been seen in hospital during the year preceding rupture on a total of 80 occasions, only undergoing 17 abdominal examinations.

Conclusion. Clinical examination is not frequently considered in routine practice as a screening tool for AAA but patients who subsequently go on to attend as an emergency ruptured AAA are likely to have consulted medical staff during the preceding years. A large number of patients have missed a prior opportunity for detection.

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Introduction

Aneurysm of the abdominal aorta (AAA) is a common condition affecting 5% of men over the age of 65 years with rupture of AAA accounting for 2% of deaths this age group. Elective AAA repair is associated with a significantly reduced operative mortality of around 6%,1,2 compared with 30–50%1,3–5 at rupture. Current practice relies on opportunistic detection with aneurysms discovered either during clinical examination or diagnostic tests for other conditions. Although abdominal examination has a low positive predictive value,4 it may have a high sensitivity of up to 80% for AAA > 5 cm4–6 and up to 100% in patients with an abdominal girth < 100 cm.6 Aneurysmal disease is part of a systemic condition and these patients are likely to present to a variety of medical staff for assessment of coincidental symptoms. They therefore have many opportunities for opportunistic detection.

Aims

This study aimed to determine the proportion of patients presenting with ruptured AAA who were not previously known to have an aneurysm, and to calculate the number of opportunities for clinical diagnosis that were missed.

Methods

Theatre log books and an electronic search of hospital coding records, were used to identify patients who presented as emergencies with symptomatic or ruptured AAA over a 5 year period. Patients were excluded if the diagnosis had not been confirmed by CT, laparotomy or post-mortem examination. Patient demographics were recorded, along with the number and types of previous hospital attendances during

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which the patient was seen by a doctor and whether routine abdominal examination had been performed. Outcome measures were whether surgery was carried out at rupture as well as the survival outcome.

**Results**

A total of 104 patients were identified who met the inclusion criteria. Their median age was 76 years (range 52–93 years). 64% (n = 67) were male. The overall mortality was 68%. At emergency attendance 27 (26%) were deemed unsuitable for surgery after assessment by a consultant surgeon. The remaining 77 patients (74%) underwent emergency surgery with an operative mortality of 58% (n = 45). Of the initial 104 patients, 33% (n = 34) were known to have an aneurysm. Of these, 15% (n = 16) were deemed unfit for elective surgery. 6% (n = 6) were lost to follow up, and a further 12 patients (12%) were known and were awaiting surgery. The remaining 70 patients (67%) were not previously known to have AAA. Analysis of this group (Table 1) revealed that during the 5 years preceding rupture 17 patients (24%) had no hospital attendances. The remaining 53 patients (76%) had been reviewed a total of 355 times in hospital during the preceding 5 years, undergoing 60 abdominal examinations. No aneurysms were found. There were 51 inpatient stays within these 5 years. During the year immediately preceding emergency admission 39 patients (56%) were seen in hospital a total of 80 times undergoing 17 abdominal examinations and including 10 inpatient stays, with no aneurysms detected.

**Discussion**

Over half of patients with previously unknown AAA have attended hospital in the preceding year and therefore may be considered to have had the “opportunity” to detect their AAA. 18 patients (17%) had their AAA detected either clinically or during radiological exam and were not followed up or were still awaiting or undergoing assessment for surgery. This analysis demonstrates that abdominal examination is infrequently performed in a group of patients with chronic systemic disease who have at some time required referral for review in the hospital setting. These patients had frequent interactions with medical staff but were not opportunistically “screened” effectively. Since the risk of rupture increases with aneurysm size, it is reasonable to presume that these patients are likely to have had palpable aneurysms. However, even amongst the few that did undergo abdominal examination it is likely that palpable AAA’s may have been missed. Abdominal examination may have a high sensitivity when specifically directed at abdominal aortic aneurysm detection but is less reliable during routine physical examination. Retrospective analysis of one UK group of patients with AAA detected incidentally during radiological investigation found that 37.8% were in fact palpable but missed at initial assessment. Other factors preventing diagnosis on examination may be related to body habitus in this group of patients. These factors as well as the time constraints of busy outpatient clinics may prevent thorough examination of every patient and thereby explain why so many were missed.

USS screening has a high sensitivity of around 99%, and may be used as a screening examination and recently has been recommended by the national screening committee. USS screening has been advocated in men between the age of 65–75. In this series USS screening criteria would have invited only 31 of the 104 patients who eventually attended with ruptured abdominal aortic aneurysm. Neither opportunistic nor mass screening is capable of detecting all AAA’s. However, many patients presenting with ruptured aneurysms remain undiagnosed despite having had the opportunity for diagnosis numerous times prior to rupture. Careful, directed abdominal aortic examination remains an essential screening tool and should be performed routinely on patients attending hospital regardless of specialty.

**Table 1. Previous clinical interactions**

<table>
<thead>
<tr>
<th>Total previoulsy undiagnosed AAA = 70</th>
<th>Preceding 5 years</th>
<th>Preceding year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out patient visits</td>
<td>354</td>
<td>70</td>
</tr>
<tr>
<td>In patient stays</td>
<td>51</td>
<td>10</td>
</tr>
<tr>
<td>Abdo exams</td>
<td>60</td>
<td>17</td>
</tr>
</tbody>
</table>

**References**


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