Abdominal aortic aneurysm – the forgotten diagnosis?

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Summary

A review of all cases of abdominal aortic aneurysm presenting to Addenbrooke's Hospital, Cambridge, in a 4-year period revealed that there were 118 such patients and confirmed the relatively low operative mortality for elective aneurysmal surgery (6.6%) compared with the high mortality (66.6%) for ruptured or leaking abdominal aneurysm. In only 50% of the cases was the correct diagnosis made during the lifetime of the patient; nor was the correct diagnosis always made after admission to hospital.

The need for an early and accurate diagnosis of abdominal aneurysms is stressed and an increased awareness of this condition, based on well established clinical features, would undoubtedly reduce the overall mortality.

Introduction

The principles of elective surgical treatment of abdominal aneurysms are well established (Bergan and Yao, 1974; Hertzner and Beven, 1977; Young, Sandberg and Couch, 1977) with a low operative mortality for elective abdominal aneurysm resection of between 2 and 5% (Darling *et al.*, 1977; Dale 1976; Thompson *et al.*, 1975; Hicks *et al.*, 1975). By contrast, the operative mortality and morbidity for resection of ruptured or leaking abdominal aneurysms is high – between 40 and 60% even in experienced hands (Van Heeckeren, 1970; Shumacker, Barnes and King, 1973; Chiariello *et al.*, 1974; Di Giovanni *et al.*, 1975; Butler, Chant and Webster, 1978).

A number of workers have stressed the importance of an early and accurate diagnosis and have recommended early surgical intervention in most patients (Ottinger, 1975; Szilagyi *et al.*, 1966; Dale, 1976; Lawrey *et al.*, 1979), while conservative treatment has been advocated for patients with severe concurrent medical disease, or in those patients with small aneurysms (Bernstein, Fischer and Varco, 1967; Myers, 1976). Many of these reports stress

efforts to improve surgical management rather than assessing the accuracy of diagnosis in the community.

In 1965 Turk reported that only a small proportion of patients with ruptured or leaking abdominal aneurysms undergo surgical treatment, and more recent reports (McGregor, 1976; Darling *et al.*, 1977; Armour, 1977) have emphasized that a large proportion of patients with ruptured abdominal aneurysms die without the correct diagnosis being made (Table 1). In a significant proportion of these patients the correct diagnosis was only made at post-mortem.

An analysis of all patients presenting with abdominal aneurysms to Addenbrooke's Hospital, Cambridge, was made over a 4-year period in order to examine the impact of abdominal aneurysm disease in one community and to assess the role played by surgical intervention.

Clinical material

A detailed review of all patients presenting to the hospital with abdominal aneurysms during the 4-year period up to 1978 was made. In addition, an analysis of 4401 post-mortem reports was undertaken to assess the incidence of abdominal aneurysm and in order to include all patients dying suddenly at home and being transferred directly to the mortuary.

During this 4-year period, 118 cases of abdominal aneurysm presented to the hospital or Pathological Department. Of these, 94 were male and 24 female, with a mean age of 71.4 years (range, 47–98 years).

A clinical assessment of the records of all patients admitted alive with abdominal aneurysms was made specifically to assess the accuracy of diagnosis during life.

Results

Of the 118 cases, 33 patients had the abdominal aneurysm diagnosed by the family doctor before ruptured or leaked, or at the surgical out-patient referral clinic. Fifteen of these 33 patients underwent an elective abdominal aneurysm repair and only 2 of them died of pneumonia and respiratory failure within 4 weeks of surgery (mortality 6%). One

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TABLE 1. Patients with ruptured abdominal aneurysms

	No. of cases	Died without operation (%)	Survivors (%)	Correctly diagnosed (%)
Calne, 1969	24	14 (58.3)	4 (16.6)	Not mentioned
Pryor, 1972	44	26 (59)	4 (9)	14 (31.8)
Bremner, Shand and Kenyon, 1977	42	8 (19)	13 (38)	21 (50)
McGregor, 1976	41	41 (100)	—	11 (26.8)
Armour, 1977	13	9 (69.2)	4 (30.7)	10 (76.9)

other patient died from pneumonia 2 years after aneurysm repair, and the remaining 13 patients are alive and well (follow-up range 18 months–6 years).

Eighteen of the 33 patients with abdominal aneurysms were treated conservatively, either because of advanced cardiovascular and pulmonary disease or because of the presence of severe concurrent illness such as bronchial carcinoma. Seven of these 18 eventually died as a direct result of rupture of their abdominal aneurysms with a mean survival of 2 years from the time of diagnosis.

Of the total 118 patients, 21 (17%) had incidental abdominal aneurysms found at post-mortem performed after death from other causes. The presence of the abdominal aneurysm had never been suspected during life and the cause of death in these patients was frequently severe cardiovascular disease.

In 71 of the 118 patients, the abdominal aneurysm leaked or ruptured, and in only 7 of these had the condition already been recognized. Twenty-four of these patients (20.3%) with ruptured abdominal aneurysms were not admitted to hospital alive but were either found dead at home or died a very short time before admission. In 5 of these 24 patients the family doctor had made the correct diagnosis of ruptured abdominal aneurysm at home shortly before the patient's death.

Of the 47 remaining patients who were admitted to hospital alive with a ruptured or leaking abdominal aneurysm, in 16 the correct diagnosis was not made pre-operatively; 12 were confidently diagnosed as suffering from other conditions.

Mistakes in diagnosis included 4 cases diagnosed as acute appendicitis, 6 of pancreatitis, and 2 patients with peritonitis of unknown origin. In 7 other patients the correct diagnosis was only made in the final collapsed phase excluding any surgical intervention.

In a further 11 patients admitted in a severely shocked condition, although the diagnosis of abdominal aneurysm was considered, death occurred before it could be confirmed or before surgical intervention.

The classical triad of symptoms of abdominal aneurysm—severe abdominal and back pain, a pulsatile abdominal mass, and a shocked patient—was seen in 19 of the 47 patients with aneurysm rupture and at least 2 of these cardinal features were

observed in a further 21 patients admitted to the hospital. Surprisingly, only 50% of the patients admitted had confirmatory abdominal X-rays and in 19 of these there was clear aortic calcification present (Fig. 1).

Thus, only 24 patients admitted alive were actually submitted to emergency surgical treatment.

Discussion

The retrospective analysis of clinical and post-mortem records is clearly subject to severe limitations and deficiencies; and yet this approach may give a better overall picture of the impact on the community of medical and surgical diagnosis and treatment of abdominal aneurysm. This limited study would appear to confirm a low level of diagnostic accuracy and a lack of awareness of this condition. It confirms that still only a relatively small proportion of patients with leaking abdominal aneurysms are submitted to surgical intervention.

Although only a small number of patients, in whom a correct diagnosis has been made, die at home with a ruptured abdominal aneurysm, it is perhaps unlikely that these patients dying so quickly after rupture of their aneurysm would survive to be admitted to hospital for surgical treatment. Thus, while an increased awareness of this potentially lethal condition by family doctors is desirable and certainly every effort should be made in patients presenting with complaints of abdominal and back pain to exclude an abdominal aneurysm, it seems likely that significant further reduction in the mortality of this condition can only occur if a diagnosis is made after admission to hospital and an early surgical assessment allows surgical intervention to be made.

The accuracy of diagnosis of this condition would be improved in patients admitted critically ill with abdominal pain and shock if abdominal (including lateral abdominal) X-rays were carefully performed. In addition, in patients in whom the diagnosis may still be in doubt, abdominal ultrasound may prove a rapid non-expensive and non-invasive technique with a high degree of accuracy in the diagnosis of major abdominal aneurysms (Leopold, Goldberger and Bernstein, 1972; Hertzner and Beven, 1978).

FIG. 1. Plain abdominal (a) and lateral (b) X-rays showing calcification of the aortic aneurysm – confirming the diagnosis.

The management of patients with ruptured abdominal aneurysms is perhaps still controversial. While some reports advocate that all patients with ruptured abdominal aneurysms should be operated on (De Bakey *et al.*, 1964; Butler, Chant and Webster, 1978; Lawrey *et al.*, 1979; Leading Article, 1977), this must remain a matter of clinical judgement. The operation still has a high operative mortality and significant morbidity and, for the extremely aged patient with additional concurrent disease, it may result in a lingering, protracted and distressing demise. Nevertheless, it should be clear that the likelihood of a patient's surviving with a ruptured abdominal aneurysm is minimal. Only by making an accurate diagnosis will the clinician be in a position to use his judgement as to the best course of action. The traditional clinical triad of features was frequently present in these patients and yet still only a small proportion had the correct diagnosis.

This survey confirms previously reported studies which show a relatively low level of clinical awareness and a low level of diagnostic accuracy is still being achieved.

Only an increased awareness of this clinical entity and the application of relatively simple diagnostic methods will increase the number of patients offered at least the chance of survival after excision of their aneurysms.

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