

ASPECTS OF TREATMENT*

Abdominal aortic aneurysms in a district general hospital

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Summary

The management of all patients with abdominal aortic aneurysms attending a district general hospital over a 6-year period is reviewed. The hazards of delaying surgical treatment are emphasised. An operative mortality of 12% for non-leaking and 55.6% for leaking aneurysms is discussed with reference to other published results. Attention is drawn to the relatively high proportion of patients not undergoing surgical treatment. Some ways in which the mortality of the condition might be reduced are considered.

Introduction

There are many reports of the results of surgery for abdominal aortic aneurysms. Usually these emanate from major vascular or surgical teaching centres. This paper describes the clinical course of all patients, including those who did not undergo operation, who were admitted to a district general hospital over a 6-year period with abdominal aortic aneurysms. Only by reviewing all such patients can the real impact of treatment on the disease be assessed.

Patients, methods, and results

The first repair of an abdominal aortic aneurysm in Southend Hospital was performed in 1971. A further 74 patients were admitted with the condition up to the end of 1977. They are divided into four groups: (1) 25 patients operated on for non-leaking aneurysms; (2) 18 patients operated on for leaking aneurysms; (3) 25 patients with leaking aneurysms who did not come to surgery; (4) a small group of 6 patients with non-leaking aneurysms who were refused surgery.

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The Editor would welcome any observations on this paper by readers

*Fellows and Members interested in submitting papers for consideration with a view to publication in this series should first write to the Editor

PATIENTS WITH NON-LEAKING ANEURYSMS UNDERGOING OPERATION

All 25 patients in this group were male. Their mean age was 64 (range 51–75) years. Details of coexistent disease are given in Table I.

Abdominal pain (13 patients (52%)) and back-ache (8 (32%)) were the most common symptoms; 22 patients (88%) had a palpable abdominal mass. Four were referred with claudication and in 2 of these the aneurysm was only detected at angiography. In 5 patients referred for unrelated conditions the aneurysm was felt during routine abdominal examination. Three patients had emergency operations within 12 h of admission; 2 of these had acutely painful pulsatile masses without signs of blood loss, while the third was initially diagnosed as acute appendicitis and a gridiron incision made before the correct diagnosis became apparent.

Before elective repair was undertaken it was felt that patients should fulfil three criteria: (1) age less than 75 years, or, if 75 or over, the patient to be in vigorous health; (2) no severe concomitant disease such as would significantly decrease the chance of surviving operation; (3) no evidence of an aneurysm extending above the renal arteries. Patients with asymptomatic aneurysms were only offered surgery if the aneurysm was thought to be 6 cm or more in diameter or had recently enlarged (1).

Aneurysm repair was carried out with knitted Dacron (polyethylene terephthalate) inlay grafts. The suture lines, where possible, were reinforced with a cuff of Dacron. Peroperative systemic heparinisation was not used. All patients were given antibiotics prophylactically and it was a general policy to ventilate patients during the first 12 h after the operation. The presence of iliac involvement, the types of graft used, and other procedures carried out at the time of operation are shown in Table II.

There were no peroperative deaths but 3 post-

TABLE I Incidence of coexistent disease in patients with abdominal aortic aneurysms

Incidental disease	Non-leaking	Leaking	Leaking
	operated n=25	operated n=18	not operated n=25
Hypertension	9 (36%)	3 (17%)	4 (16%)
Ischaemic heart disease	9 (36%)	6 (33%)	6 (24%)
Peptic ulceration	5 (20%)	2 (11%)	0
Chronic pulmonary disease	4 (16%)	1 (6%)	7 (28%)
Diabetes mellitus	2 (8%)	0	0
Smoker	21 (84%)	15 (83%)	Not recorded

operative deaths, 2 from pulmonary embolism and 1 from superior mesenteric ischaemia. Thus the operative mortality in this group was 12%. Amongst the survivors respiratory tract infections, of which there were 4, were the most common complication. One patient developed arterial thrombosis of a lower limb and subsequently required below-knee amputation. The mean post-operative stay in hospital was 17 days (range 10 days-8 weeks).

PATIENTS OPERATED ON FOR LEAKING ANEURYSMS

This group of 18 patients had a mean age of 69 (range 54-80) years. All but one were male. Details of their general health are given in Table I.

Fifteen patients (83%) presented with severe abdominal pain, radiating to the back in 7 (39%); 15 (83%) had a pulsatile mass and 1 a non-pulsatile mass. Seven (39%) were described as shocked on admission and 4 (22%) were anuric.

In addition to fulfilling the criteria required of patients with non-leaking aneurysms, patients with leaking aneurysms were expected to fulfil one further criterion—namely, no prolonged period of anuria or failure to respond to mannitol by a diuresis.

Operative techniques were similar to those used in patients with non-leaking aneurysms except that skin preparation and towelling-up preceded induction of anaesthesia. No special effort was made to avoid the use of bifurcation grafts (2).

Eight patients survived emergency repair and 10 died, giving an operative mortality of 55.6%. Two patients died during operation; one suffered cardiac arrest and the other, who had an aorto-caval fistula, developed a clotting defect. Post-operative causes of death were: cardiac failure (4 patients) and respiratory failure, renal failure, lower limb ischaemia, and ischaemic bowel (1 each).

Three of the survivors developed severe bronchopneumonia and 3 uraemia (blood urea \geq 17 mmol/l (\geq 100 mg/100 ml) for 3 consecutive days). One required a femoral embolectomy (with a good result) on the 2nd postoperative day. The mean postoperative survival time was 18 (range 1-28) days. The survivors spent on average 21 days in hospital after operation (range 13-46 days).

PATIENTS WITH LEAKING ANEURYSMS WHO DID NOT UNDERGO OPERATION

Of the 25 patients in this group 18 were male

TABLE II Operative details of patients undergoing surgery

	Non-leaking		Leaking	
	(n=25)	All (n=18)	Survivors (n=8)	Non-survivors (n=10)
Iliac involvement	17 (68%)	6 (33%)	1	5
Straight graft*	3 (12%)	7 (39%)	4	3
Aortoiliac graft	15 (60%)	7 (39%)	4	3
Aortoiliac/femoral graft	4 (16%)	3 (17%)	0	3
Aortofemoral graft	2 (8%)	1 (6%)	0	1
Mean cross-clamp times (min)	88	93	85	100
Other operative procedures performed at time of repair	Iliac dis-obliteration.		Vagotomy & pyloroplasty.	
	Profundo-plasty. Vagotomy & pyloroplasty.		Iliac embolectomy.	

*One patient was inoperable because of a horseshoe kidney; he subsequently died.

and 7 female. The mean age was 75 (range 58–84) years. Eighteen (72%) presented with the classical triad of abdominal pain, pulsatile mass, and signs of blood loss. In 10 (40%) the pain radiated to the back. Fifteen (60%) of the patients were clinically shocked on admission. In 7 patients either no firm diagnosis was made or the wrong diagnosis was made and acted on; all these patients died.

What became of the 18 patients with the classical features of a leaking abdominal aneurysm? Two died before induction of anaesthesia, 9 were either moribund on admission or failed to meet the criteria for surgery, and 5 achieved relative stability after admission but the true gravity and urgency of their condition was not appreciated and referral to the vascular team was fatally delayed. In all these 16 patients the diagnosis was confirmed at necropsy. The remaining 2 patients, aged 83 and 75 years respectively, had a sustained response to supportive treatment; one died 2 months later, while the other went home!

PATIENTS WITH NON-RUPTURED ANEURYSMS WHO WERE REFUSED OPERATION

There were 3 males and 3 females in this group with a mean age of 79 (range 65–99) years. All had either a combination of old age (≥ 75 years) and relatively asymptomatic aneurysms or aneurysms with coexistent disease which would have made repair inadvisable.

Comment

Data available from the Registrar General (3) and postmortem studies (4) indicate that during the 6 years of the study some 200 patients in the catchment area of Southend Hospital (315 000) might have been expected to develop or die of abdominal aortic aneurysms. This disparity between the numbers dying of the disease and of those seen in hospital was noted by Armour (5), who found that only 14 out of 25 patients with leaking aortic aneurysms were admitted to hospital.

Why are more patients not referred for surgery? Aneurysms may be asymptomatic; in 20% of the patients in the present series with non-leaking aneurysms the diagnosis was made incidentally at referral for some other complaint. Once they became symptomatic, then the diagnosis was usually obvious. Certainly abdominal examination of all patients in the age groups at risk who develop abdominal or back pain should improve the diagnostic rate before leakage occurs.

Others (6,7) have commented on the difficult-

ies of diagnosing leaking aneurysms. This problem was encountered in about 30% of the present series and compares favourably with Pryor's series, in which the diagnosis was made only at necropsy in 30%. However, in 3 patients in the present series the correct diagnosis was made only at laparotomy.

Once the decision to treat a patient surgically has been made operation should be considered urgent. In one patient in the present series the aneurysm ruptured while he was awaiting elective repair, but he survived emergency repair. The time factor is even more critical in those with leaking aneurysms. The 5 patients who were referred late on in their clinical course and died before effective treatment could be given attest to this. Wyatt (8) emphasised the importance of resuscitating these patients in the anaesthetic room. Morris (9) felt that one way in which the mortality of leakage could be reduced would be to shorten the interval between rupture and surgery; in the present series the survivors averaged 3 h from the time of diagnosis to arrival in theatre.

The decision where to operate may also be of importance. It has been stated (10) that all patients intended for elective repair should be transferred to a vascular centre. Although our 12% operative mortality for elective repair is higher than is now achieved in many such centres (11), it is hoped that with increasing experience this figure will decrease. Others (12) have even stated a case for transferring patients with leaking aneurysms considerable distances, the justification being that, of the patients who survive operation, all will require highly intensive and skilled postoperative care which is probably best provided in a large centre. Certainly the results from this series would not encourage a policy of patient transfer. A mortality of 55% is within the wide range previously reported (13).

Indeed, there are strong arguments against transfer, which inevitably lengthens the period between leakage and repair. Patients who die postoperatively often survive for several days (14). In the present series only one patient died within a week of leaving the operating table, the mean interval being 18 days. It would seem that death is related to the patient's inability to survive a period of shock and profound haemodynamic disturbance rather than to a failure of operative technique. It seems reasonable to suppose that the shorter the period, the better the prognosis; and this must mean repair of the aneurysm at the earliest opportunity in the nearest hospital in which it can reasonably be performed.

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