

Results of 50 Consecutive Aneurysmectomies for Abdominal Aortic Aneurysms at a Private Specialist Centre

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Summary

The management of abdominal aortic aneurysms (AAA) at a private medical centre was reviewed. The criteria for surgery were AAA more than or equal to five centimeters in diameter, symptomatic AAA even if less than five centimeters and ruptured AAA. A total of 67 patients were seen between October 1991 to September 1994. The age range was 48 to 94 years, mean = 69.8. There were 58 males to nine females. Twelve patients presented with ruptured AAA. There were three suprarenal AAA and three mycotic AAA. Aneurysmectomies were performed on 50 patients. This include all patients with ruptured AAA. There was no mortality in the elective cases. One patient with ruptured AAA died, ie. an operative mortality of eight per cent. It was concluded that a very low operative mortality can be achieved in this group of high risk patients. Our results were comparable to those reported by other centres in the developed countries. Important factors contributing to these results include a team approach in a unit interested in this disease, careful pre-operative preparation and a rigid post-operative regime. For ruptured AAA, survival of the patient depended on a successful and timely operation. It was also concluded that no patient should be deemed unfit for surgery or denied an operation if they needed to have one and it was safe to transport patients with ruptured AAA to a centre where the operation can be performed.

Key Words: Aortic aneurysm, Aneurysmectomy, Operative mortality

Introduction

The author's experience of surgery for abdominal aortic aneurysm (AAA) had previously been reported¹. He had since moved to a private hospital. The current experience is reported. The results are analysed and compared with the earlier experience.

The medical centre where the authors practise is a tertiary consultant based hospital. As such, all patients with vascular diseases are managed by the vascular surgeon. A single anaesthetist, with interest in vascular disease, is involved in all the operations, the intensive

care and the post-operative pain relief. General physicians and cardiologists may help in the management of the patients where it is appropriate. The surgery is performed by the vascular surgeon assisted by trained operating theatre nurses.

Patients and Methods

All patients with abdominal aortic aneurysm seen by the author between October 1991 to September 1994 were included in the study. Suprarenal AAA were included in the study but thoracoabdominal aneurysms were not. All records were made prospectively.

In the elective cases, operations were advised for all patients with AAA whose maximum diameter was equal to or more than five centimeters. Operations were also advised for those who had AAA of less than five centimeters in diameter if they had symptoms, usually pain. The exception to these rules were patients with other life-limiting illness. Operations were performed on all patients with ruptured AAA who arrived at the hospital in a conscious state.

Results

During the study period, a total of 67 patients with AAA were seen. The age range was 48 to 94 years, mean = 69.8. There was a male preponderance with a sex ratio of 58 males to nine females (=6 : 1). The racial distribution was 45 Chinese : 19 Malays : 1 Indian : 2 Others. The associated medical illnesses are listed in Table I. Most significantly, 82.1% (n=55) were smokers or ex-smokers, 35.8% (n=24) had ischemic heart disease and 51.5% (n=34) were hypertensive.

Fifty-five patients presented electively and 12 presented as emergencies (ruptured AAA). In the elective cases, the presentations were asymptomatic in 23, abdominal mass in eight and abdominal pain in 22 patients. Two patients presented with peripheral embolisation.

There were three suprarenal AAA, the others were infrarenal. Three of the AAA were infected (mycotic). Two of these presented as ruptured AAA but one was diagnosed before it ruptured. The maximum diameter of the AAA were 3.5 to 15 centimeters, mean = 6.7

Table I
Associated illness in patients with AAA

	No. of patients
Smoking	55
Hypertension	34
Ischemic heart disease	24
Chronic obstructive airway disease	11
Cerebrovascular disease	2
End-stage renal disease	1

for the elective cases. For the ruptured AAA, it was six to 15 centimeters, but the mean was 9.1 centimeters.

A total of 50 operations were performed during this period. All of the patients who presented with ruptured AAA, including a 94-year-old female and a 59-year-old male with end-stage renal disease on regular hemodialysis, underwent emergency operations. In the intact AAA, operations were performed on 38 patients. The reason for not operating the other patients were largely due to patients' refusal (n=13). Two patients had advanced cancer and another two patients had deferred their operations.

The operations were performed through a transverse abdominal incision in the elective cases or a midline incision in the emergencies. The standard operative procedure was excision and inlay grafting. For the mycotic AAA, the aneurysms were excised and circulation were restored by an Axillo-bifemoral bypass graft. Woven Dacron grafts were used in all cases.

Patients with ruptured AAA were admitted directly to the intensive care unit and they were usually in the operating room within an hour of their arrival at the hospital. All patients who arrived in a conscious state were operated upon. At operation the priority was to achieve proximal and distal control whereupon further transfusion of blood and fluid would be given as necessary. Post-operatively, the patients were monitored in the intensive care unit.

There were no deaths in the 38 elective cases. The significant morbidities were acute lower limbs ischemia requiring embolectomy in one patient and acute myocardial infarction and small bowel obstruction (both) in another patient. The single death in this series was in a 67-year-old patient operated for a ruptured AAA. He died on the 17th post-operative day from multi-organ failure.

Discussion

The patient group in this study is similar to that of previous studies^{1,2}. The patients are largely elderly with a mean age of nearly 70 years. There is a male

Table II
Operative mortality

Reference	Year	Operative mortality (%)	
		Elective	Ruptured
Campbell WB <i>et al</i> (4)	1986	4.2	55.8
Mutirangura P <i>et al</i> (5)	1989	2.9	
Leong YP (1)	1991	2.4	47.1
Breckwoldt WL <i>et al</i> (6)	1991	1.0	
Scott A <i>et al</i> (7)	1992	1.4	30.0
Akkersdijk GJM <i>et al</i> (8)	1994	6.8	43.6
Leong YP	1994	0	8.3

preponderance. All the major races are affected. The high ratio of Chinese patients in this series is probably a reflection of the uneven racial distribution of patients seen in private practice rather than its true incidence. The high incidence of smoking, hypertension and ischemic heart disease is again similar to the previous studies.

The aetiology of the AAA is mainly atherosclerosis. Three are infective in origin and two patients (brothers) had a strong family history. The other theories, viz the proteolytic enzyme theory and the trace metal theory³ are difficult to prove. The management is the same in all cases, except for mycotic AAA. Where infection is present, the graft cannot be placed in the infected area.

Compared to the earlier series^{1,2}, the operative mortality for the elective cases is slightly improved, but a significant improvement is recorded in the emergencies for ruptured AAA. This improvement may be attributed to the consultant based practice where a single experienced consultant surgeon and a single experienced consultant anaesthetist take care of the patient. The ready availability of a bed in an intensive care unit with up-to-date monitoring devices and facilities for post-operative care is also important⁴. The absolute necessity of intensive care monitoring of patients with ruptured AAA in the immediate post-operative period in these patients cannot be over emphasised.

Worldwide, the operative mortality quoted for elective aneurysmectomies is between one to seven per cent⁵⁻⁹. See Table II. For ruptured AAA, it is between 30 to 60 per cent⁵⁻⁹. We have no mortality for our elective cases and the mortality for our ruptured AAA is eight per cent. In this series the patients are not selected. Elective patients who agreed to the operation are worked-up pre-operatively. Where there are medical conditions that required treatment, the operation may be delayed. No patient is denied an operation where it is felt that aneurysmectomy is necessary.

The management of ruptured AAA is very challenging. The patients present in a state of shock and their only chance of survival depend on a successful operation. The top priority in these patients is to get them into the operating theatre for an emergency laparotomy. Resuscitation is adequate when a systolic blood pressure of 90 to 110 mmHg is obtained. This is usually achieved by transfusion of crystalloid or colloid. Pre-operative blood transfusion is rarely required except for patients who are to be transported over a long distant.

There are still many medical practitioners who are not convinced of the importance or the safety of early surgery for AAA. This study had shown that aneurysmectomy in an established centre can be performed with very low mortality and morbidity. The operative mortality is comparable or lower than the mortality for colonic resection for cancer. Yet there are doctors who elect to 'observe' the AAA or just ignore the problem. Waiting

for the 'time-bomb' to explode is not the solution to this problem and should be condemned.

Quite often patients are told that they are not fit for surgery. It is true that nearly all of these patients are elderly and also have multiple medical problems. However, most of them can be prepared to an optimum state for surgery. 'Fitness for surgery' is a relative term. A patient with a painful 10 centimeters AAA whose risk of rupture and consequent death is about 100 per cent can accept a higher operative risk than a patient with a four centimeter aneurysm whose risk of rupture is about 15 per cent per year¹⁰. It is usually possible to strike a balance between the risk of operation and the risk of rupture and to advise the patients accordingly.

The question of whether patients with ruptured AAA can be transported frequently arise. Six of our patients with ruptured AAA are transported from outside Kuala Lumpur. Five are from more than 150 kilometers away and one is from more than 40 kilometers away. All these patients survived and are discharged well. Hence, it is safe to transport such patients after initial stabilisation. If necessary,

emergency air transport can be arranged. It has been shown that it is more important to transport the patient to a hospital with adequate facilities and expertises than to shorten transport time by operating in a local hospital where facilities and expertises may be inadequate¹¹.

It is concluded that surgery for elective and ruptured AAA can be safely performed with very low mortality and morbidity in this private centre. Our results are comparable to those reported by other larger centres in developed countries. Results of early (elective) surgery is better than late (emergency) surgery. Only very few patients, if any at all, is truly unfit for surgery and no patient should be denied operation if they need one. If necessary, transport of patients with ruptured AAA is safe.

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References

1. Leong YP. Abdominal aortic aneurysm - A plea for early elective excision (Aneurysmectomy). *Med J Malaysia* 1991;46 : 51-8.
2. Leong YP. Abdominal aortic surgery in Malaysia. *Asian J Surg*; 12 : 47-50.
3. Pleumeekers HJCM, Hoes AW, van der Does E, Van Urk H & Grobbee E. Epidemiology of abdominal aortic aneurysms. *Eur J Vasc Surg* 1994;8 : 119-28.
4. Lepantalo M. Should Vascular surgery be centralised or decentralised? A Nordic point of view. *Eur J Vasc Surg* 1994;8 : 116-8.
5. Campbell WB, Collin J & Morris PJ. The mortality of abdominal aortic aneurysm. *Ann R Coll Surg Engl* 1986;68 : 275-8.
6. Mutirangura P, Stonebridge PA, Clason AE, McClure JH, Wildsmith JAW, Nolan B, Ruckley CV & Jenkins AMCL. Ten-year review of non-ruptured aortic aneurysms. *Br J Surg* 1989;76 : 1251-4.
7. Breckwoldt WL, Mackey WC & O'Donnell TF Jr. The economic implications of high-risk abdominal aortic aneurysms. *J Vasc Surg* 1991;13 : 798-804.
8. Scott A, Baillie CT, Sutton GL, Smith A & Bowyer RC. Audit of 200 consecutive aortic aneurysm repair carried out by a single surgeon in a district hospital : results of surgery and factors affecting outcome. *Ann R Coll Surg Engl* 1992;74 : 205-11.
9. Akkersdijk GJM, van der Graaf Y, van Bockel JH, de Vries AC & Eikelboom BC. Mortality rates associated with operative treatment of infrarenal abdominal aortic aneurysm in the Netherlands. *Br J Surg* 1994;81 : 706-9.
10. Rutherford RB. Infrarenal aortic aneurysms. In : Rutherford RB. *Vascular Surgery*. Philadelphia : WB Saunders, 1985 : 755-71.
11. Amundsen S, Skjaerven R, Trippestad A & Soreide O. Abdominal aortic aneurysm - a study of factors influencing post-operative mortality. *Eur J Vasc Surg* 1989;3 : 405-9.