REVIEW OF ABDOMINAL AORTIC ANEURYSMS AT THE UNIVERSITY HOSPITAL, KUALA LUMPUR

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INTRODUCTION

Aneurysms were first described by Gallen in the second century. It was only in the twentieth century that Dubost [1] in France first excised an abdominal aortic aneurysm and replaced it with a graft. Since then, over the past 25 years, there have been rapid advances both in the field of prosthetic materials and technical approaches in the surgical management of abdominal aortic aneurysms and now, grafting of these aneurysms is a well established surgical procedure.

Fig. 1 is from an actuarial study carried out by the New York group of Insurance Companies on the life expectancy of patients with untreated abdominal aortic aneurysms.

It illustrates the poor prognosis in patients with untreated abdominal aortic aneurysms, only 20 percent of them are alive after five years.

It is therefore accepted that apart from the complications of distal embolization, sudden complete thrombosis, chronic disseminated intravascular coagulation and intestinal fistulization, sudden rupture of the aneurysm will lead to the death of the patient.

It is for these reasons that most surgeons would now accept that abdominal aortic aneurysms which are greater than 6 cms. in diameter or are symptomatic, need grafting. A leaking abdominal aortic aneurysm is an absolute indication for emergency surgery.

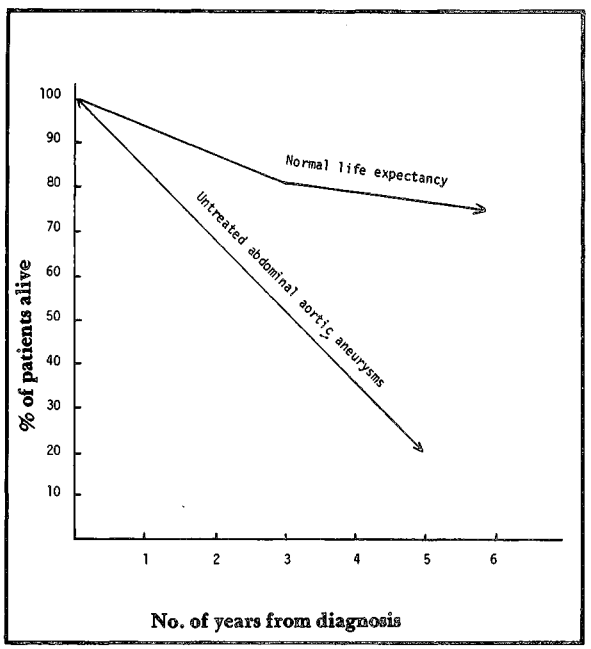

Fig. 1 The natural history and survival rates amongst patients with untreated abdominal aortic aneurysms.

MATERIALS AND METHODS

This is a review of patients with abdominal aortic aneurysms seen at the University Hospital, Kuala Lumpur from March 1967 till June 1980. During this period 53 patients presented with abdominal aortic aneurysms and of these 49 were available for this review.

RACIAL AND SEX DISTRIBUTION

Of the 3 major races in this country, it appears

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TABLE I
RACIAL DISTRIBUTION OF PATIENTS WITH ABDOMINAL AORTIC ANEURYSMS

Race	No. in review	Percentage	Racial Distributions of total hospital admissions
Chinese	27	55.1	58.5%
Malay	18	36.7	23.0%
Indian	2	4.1	16.4%
Others	2	4.1	2.1%
Total:	49	100	100%

that the Malay population is at highest risk. This is illustrated in Table I. The overall sex ratio is 11.25 males to 1 female.

AGE DISTRIBUTION

Although abdominal aortic aneurysms tend to occur in the older age groups (Fig. 2) there was a patient of only 30 years of age. He suffered from cystic medial necrosis and liver cirrhosis. He had a successful graft but died 6 months later from liver failure. The other young patient was a 39 year old lady with severe hypertensive disease.

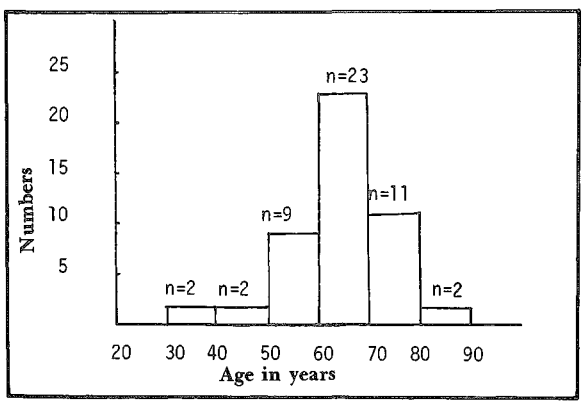

Fig. 2 Age distribution of patients with abdominal aortic aneurysms.

SYMPTOMS AT PRESENTATION

The most common symptom at presentation is abdominal pain. This symptom includes a generalized ache or a feeling of tightness in the abdomen. Table II also shows that only 6 percent of patients had their aneurysms recognized at routine clinical examination for some other medical condition. All these aneurysms were greater than 6 centimeters in diameter and as such they have been included in the symptomatic group. Seven patients presented with severe abdominal pain. They had leaking abdominal aortic aneurysms.

TABLE II
SYMPTOMS AT PRESENTATION IN PATIENTS WITH ABDOMINAL AORTIC ANEURYSMS

Symptom	Number	Percentage
Abdominal pain	29	59.2
Abdominal mass	15	30.6
Pulsatile sensation	6	12.2
Back pain	9	18.4
Weakness in legs	4	8.2
Intermittent claudication	2	4.0
Lump in groin	1	2.0
Asymptomatic	3	6.1
Severe abdominal pain (leaking aneurysms)	7	14.3

ASSOCIATED DISEASES

Atherosclerosis tends to be a multisystemic disease and as such these patients tend to have other evidence of this disease. This is shown in Table III. 46.9 percent of our patients had hypertensive disease. Three patients had had previous myocardial infarcts. These 3 patients had their aneurysms successfully grafted.

INVESTIGATIONS

During the earlier years of this review, 13 aortograms were performed. There were no severe complications. In 4 patients, attempted aortography was unsuccessful. In one patient, the aortogram failed to outline the aneurysm. Recently the Department of Radiology has acquired an ultrasonic scanner and a C.T. scanner. These are now the investigations of choice for patients with abdominal aortic aneurysms.

RESULTS

Of the 49 patients in this review, 21 patients were operated on. Of the remaining 28 patients, 16 patients had some associated medical condition e.g. Hypertension or Diabetes. They were initially discharged on appropriate medical management before planned operative treatment for their aneurysm. These patients however, failed to turn up for their operation. Two patients had aneurysms which extended proximal to their renal vessels and these aneurysms were considered to be technically inoperable. Eight patients were deemed inoperable because of their age and poor general condition. One patient was managed conservatively for

TABLE III
ASSOCIATED DISEASES IN PATIENTS WITH ABDOMINAL AORTIC ANEURYSMS

Associated Disease	Number	Percentage
Hypertension	23	46.9
Diabetes	5	10.2
Previous cerebro-vascular accident	4	8.2
Previous Myocardial Infarct	3	6.1
Ischaemic Heart Disease	3	6.1
Chronic Obstructive airways disease	2	4.1
Aortic incompetence	2	4.1
Peptic ulceration	2	4.1
Recurrent urinary tract infection	2	4.1
Senile dementia	1	2.0
Liver cirrhosis	1	2.0

undiagnosed abdominal pain but died suddenly. The diagnosis of a ruptured abdominal aneurysm was obtained at post mortem examination. Another patient died at induction of anaesthesia.

Of the remaining 21 patients who were operated on, 16 of the patients had their surgery performed as elective cases. The remaining 5 patients were operated on as emergencies for their leaking aneurysms. There were no deaths in the elective cases but 2 of the patients with leaking aneurysms died.

LEAKING ANEURYSMS

There were 7 patients who presented with leaking abdominal aortic aneurysms. Three of these patients had their aneurysms successfully grafted. One patient had an unrecordable blood pressure at presentation. He had a grafting procedure performed but he died 12 days later from anastomotic leak at the graft site, wound dehiscence and renal failure. Another patient died from anterior rupture of the aneurysm into the peritoneal cavity at laparotomy. Of the two remaining patients with leaking abdominal aortic aneurysm who were not operated on, one of them died at induction of anaesthesia and the other died while under observation for undiagnosed abdominal pain.

COMPLICATIONS AND HOSPITAL STAY

Chest infection heads the list of post-operative morbidity (Table IV). One of the patients had a prolonged paralytic ileus and required a laparotomy. No mechanical bowel obstruction was found. The patient who had the graft infection and anastomotic leak also had a wound dehiscence and renal failure. He had presented as a leaking abdominal aneurysm and had a prolonged preoperative hypotension.

The average length of hospital stay was 24 days (range 9-58 days).

LONG TERM FOLLOW-UP

Of the 21 patients operated on, 5 patients failed to turn up for a follow-up. Of the remaining, the average period of follow-up was 26 months (ranging from 1 month to 7 years). As far as could be ascertained, 2 patients had long term complications.

One of them presented with symptoms of bowel obstruction and a laparotomy revealed adhesions tethering down the fourth part of the duodenum. The graft was functioning normally. The other patient presented 3 years after surgery with symptoms of occlusive disease in his legs. This was not severe enough to warrant surgery.

It was not possible to determine the fate of those patients who were not operated on as they failed to return for follow-up.

TABLE IV
COMPLICATIONS FOLLOWING SURGERY FOR ABDOMINAL AORTIC ANEURYSMS

Morbidity	Number
Chest Infection	5
Paralytic Ileus	4
Renal Failure	3
Temporary Ischaemia of Large Bowel	2
Stress Ulcer	1
Graft Infection & Anastomotic Leak	1
Wound Dehiscence	1
Urinary Retention	1

DISCUSSION

Arteriosclerotic disease is now an increasingly common disease in Malaysia. With the rapid socio-economic development of Malaysia, the life expectancy for males as shown in the Abridged Life Tables for Malaysia [2] has now increased from 55.8 years in 1957 to 62.2 years in 1970. It is therefore reasonable to forsee that this disease of which abdominal aortic aneurysm is one complication will become even more common in the near future.

Diagnosis of abdominal aortic aneurysms requires a high index of suspicion. The more common presenting symptoms have been illustrated in this review. It is well known for these aneurysms to present as backache to the orthopaedic clinic. In the medical clinics, the asymptomatic aneurysm may be found on routine clinical examination of diabetic and hypertensive patients. 47 percent of our patients were hypertensive. Gordon-Smith *et al* [3] quotes a figure of 48 percent.

In patients who present with acute undiagnosed abdominal pain, one should always have a diagnosis of a leaking abdominal aortic aneurysm in mind. It should be included in the differential diagnosis of pancreatitis, perforated peptic ulcers, acute mesenteric ischaemia, acute prolapse of an intervertebral disc and even acute urinary retention. One of our patients died as a result of the diagnosis being missed. McGregor [4] in reviewing 9,894 post mortem examinations found that 21 of 41 cases of fatal rupture of abdominal aortic aneurysms were not diagnosed until post mortem.

Asymptomatic aneurysm is one of the more urgent indications for surgery. A history of myocardial infarction or ischaemic heart disease per se is not a contraindication to surgery. Three of our patients had had previous myocardial infarcts and they had successful operations, age in itself is also not a contraindication. Linton [5] has shown that the results from operations in patients over 80 years can be better than their untreated life expectancy.

In investigating these patients, plain abdominal x-rays in the supine and lateral positions are useful as calcification in the wall of the aneurysm may be demonstrated and may give an indication of its size. Arteriography may be useful in a small selected group of patients who may have evidence of occlusive disease in the legs, the gastrointestinal system or the kidneys but this investigation can be associated with quite severe complications. It may give a false impression of the size of the aneurysm due to thrombosis in the wall of the aneurysmal sac. An ultrasonic scan or a CT scan gives a much better indication of its size, is non-invasive and has no serious complications. It can also be used to monitor the rate of increase in size of the smaller aneurysms.

Surgical grafting of an abdominal aortic aneurysm is now a well established procedure and results are good. Gordon-Smith *et al* [3] reported a mortality of 16.4 percent for elective cases in a review from 1969 to 1975. But following that, their intensive care unit was instituted and they had no deaths among 51 consecutive cases in the following two years. There were no deaths in the elective cases in this review. Our ratio of emergency to elective cases was 3.2 : 1. Surgery on the leaking aneurysm is still fraught with danger. Two out of five of our cases died. Gordon-Smith [3] gives a mortality of 30 percent. The outlook for patients with leaking abdominal aneurysms depends to a great extent on the severity and period of hypotension they have suffered. One of our patients had an unrecordable blood pressure on admission. He developed acute renal failure in the post-operative period and died. When operating on leaking abdominal aneurysms, the accepted practice is to induce anaesthesia only when the surgeon is in readiness to immediately perform the laparotomy and gain control of the proximal aorta. It is thought that these aneurysms are most liable to rupture into the abdominal cavity when the muscle relaxants, given at induction of anaesthesia results in a loss of the splinting action of the muscles of the abdominal wall. One of our patients with a leaking abdominal aortic aneurysm died from this.

In conclusion, abdominal aortic aneurysms are still relatively rare in this part of the world. We have seen only 53 cases over a period of 13 years. With the increasing incidence of artherosclerotic disease in Malaysia, and a greater awareness of its complications, the diagnosis of abdominal aortic aneurysms may become more frequent and these patients can now have the appropriate surgical management.

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