

## A STUDY OF EXTRACRANIAL ANEURYSMS AT UNTH IN ENUGU, NIGERIA

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### ABSTRACT

**Background:** Previous studies on aneurysms in Nigeria have either been case reports or studies of peripheral aneurysms. No study has comprehensively evaluated all aspects of this disease as an entity among Nigerians. The need therefore arises to re-evaluate this lesion so as to make deductions on incidence, sex ratio, aetiology and management.

**Study design:** This is a retrospective descriptive study of arterial aneurysms at the University of Nigeria Teaching Hospital (UNTH), Enugu. Those treated between January 1993 and December 2002 were included for the study. Data were obtained from medical records for all patients admitted with aneurysms over the study period.

**Results:** A total of 26 patients were admitted during the period, but 24 case notes were analysed. The age range was 10-75 years with male: female ratio of 1.4:1.

Traumatic pseudo aneurysms accounted for 16 cases (67.0%) while true aneurysms comprised the remaining. Of all the aneurysms, femoral artery with most of the pseudo aneurysms had 8 out of 24 (33.0%). This is followed by the infra-renal abdominal aorta (5/24, 21.0%) and other sites (11/24, 46.0%). Diagnoses were made clinically in most cases and by abdominal ultrasonography in abdominal aortic aneurysms. Twenty-one patients had surgical intervention with 9.5% operative mortality.

**Conclusion:** The incidence of aneurysm is low in our locality (2.6/year) based on the rate of diagnosis. Abdominal aorta harbours most of the true aneurysms with diameter ranging from 8.0-15.0cm without rupture. Untreated, all will eventually rupture with catastrophic consequences. Treatment involved excision with graft interposition. This is not only expensive but the graft is often not readily available. As a solution, grafts should be stocked with drug revolving fund.

**Key Words:** trauma, true and pseudo aneurysm.

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### INTRODUCTION

Several aspects of aneurismal disease of the artery have been reported in Nigeria<sup>1-12</sup>. Most of these publications are case reports. The few detailed studies of this lesion have examined one aspect or the other of the aneurysm<sup>7,8,11</sup>. No study has examined this condition more comprehensively among Nigerians. This observation prompted the authors to study the pattern of aneurysms at the Nigeria's National Cardiothoracic Centre located at the University of Nigeria Teaching Hospital, Enugu. Aneurysms do rupture and rupture of aneurysm of a major vessel such as aortic aneurysm is usually fatal in a matter of hours<sup>13</sup>. There are few centres in Nigeria that have both the manpower and state of the art equipment for the diagnosis and treatment of this condition. Again, some patients can not even carry out investigations or afford grafts because of financial constraint. The practitioners are left with no option than to use clinical acumen and available investigative tools as the case may be.

### MATERIALS AND METHOD

This is a descriptive retrospective study conducted at the National Cardiothoracic Centre of Nigeria over a 10-year period (Jan 1993-Dec 2002).

Use was made of hospital records of all patients admitted for aneurysms during the period of study. Information gathered included age, sex, anatomic site, type of aneurysm, mode of injury where applicable, investigation modality, social habits, associated medical condition, type of treatment offered and outcome, and duration of follow up.

During investigations, plain X-ray in two views, ultrasonography and arteriography of arteries of affected anatomic site were requested. The X-ray showed increased soft tissue shadow and occasional calcification of vessel wall. Ultrasonography demonstrated size of dilatation of the vessel diameter, intraluminal thrombus formation and rupture of vessel wall. Arteriography showed dilatation, patency or occlusion of the vessel, rupture with extravasations, fistula or dissection of vessel wall and integrity of renal supply in case of abdominal aorta.

### RESULTS

A total of 26 patients, all referred, with arterial aneurysms were seen during the 10-year period, an incidence of 2.6 per annum. Twenty-four case- notes were available for study.

The ages ranged from 10-75 years with a mean of 44.75 years and an overall male: female ratio of 1.4:1. Below the age of 45, twice as many males as females were affected.

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The leading cause of aneurysm was trauma. Majority of these traumatic aneurysms were in patients below 55 years of age. The modes of injury were mainly from civil violence involving stabs with knives, pieces of bottles and glasses, and gunshot injuries.

One 10-year old boy that developed right common carotid aneurysm sustained the injury as a result of stick puncture following a fall from a tree. In another case a 59-year old chronic renal failure patient developed false aneurysm from percutaneous femoral cannulation for haemodialysis.

Hypertension was commoner in patients with true aneurysm showing a significant association. All the 8 patients with true aneurysm had systemic hypertension. Three-quarters (18/24) of all aneurysms were located peripherally with the femoral artery harbouring one-third (8/24) of all the cases. This was followed by infra-renal abdominal aorta (Table 1). Two of the femoral aneurysms were traumatic arteriovenous fistulae involving the superficial femoral artery. On the whole, pseudo aneurysm was the commoner type of aneurysm, 16 out of 24 (67.0%).

Diagnoses were by clinical examination only in half of the cases and by ultra-sonography in remaining half. Catheter arteriography or CT angiography were not routinely done (Table 2) during investigations. Table 3 shows the treatment modalities. Twenty-one patients made up of 16 pseudo and 5 true aneurysms had surgical intervention. Majority of the patients had excision of the pseudo aneurysmal sac with direct lateral suture of the arterial defect. Four of the patients with infra-renal abdominal aortic aneurysms had excision with interposition graft substitution using bifurcated preclotted Dacron graft. The diameter of the aneurysmal sac in these patients ranged from 8.0-15.0cm without rupture. Abdominal aorta involvement extended to the bifurcation in all 5 cases of infra renal lesions. In none of these patients was it necessary to re-implant the inferior mesenteric artery as this was thrombosed and adequate collaterals were already established. In one of them, the aneurysm extended to involve the common iliac arteries.

One of the patients with superficial temporal artery aneurysm was a 15-year old boy that sustained the lesion following a blow to the left side of the head. There was concomitant chronic ipsilateral subdural

collection with expressive aphasia and contralateral hemiparesis. He made an uneventful recovery with excision of the aneurysm, ligation of the artery and burr-hole drainage of the subdural collection.

Among the 21 patients that received surgical intervention, there were two operative deaths (9.5% operative mortality). These comprised one primary haemorrhage in a traumatic axillary aneurysm and one left colonic ischaemia complicating abdominal aortic aneurysm surgery. They died a day and 3 days post operatively respectively.

All the three patients that did not receive surgery died from primary haemorrhage secondary to rupture of the aneurysms. Their diameters could not be ascertained. These patients comprised one thoraco-abdominal, one infra-renal abdominal aortic and one traumatic femoral aneurysms. The average duration for follow-up after surgery was 3 months because these patients defaulted as soon as they became well. During this period there was no recorded complication.

Table 1: **Distribution by anatomic site and type of arterial aneurysm.**

Site	Type	
	True	Pseudo
Radial	2	2
Brachial	1	1
Palmar	1	1
Axillary	1	1
Carotid	1	1
Popliteal		2
Femoral	8	7
Superficial Temporal	2	2
Infra-renal abdominal aorta	5	5
Thoraco-abdominal aorta	1	1
<b>Total</b>	<b>24</b>	<b>16</b>

Table 2: **Investigation Modality.**

Investigation	No. of Patients	(%)
Ultrasonography	8	33.3
Plain X-ray	7	29.2
Non-specific	8	33.3
Arteriography	1	4.2
<b>Total</b>	<b>24</b>	<b>100.0</b>

Table 3: **Treatment options and outcome.**

Type of treatment	No. of patients	Outcome
Excision and direct suture	10	Good
Excision and ligation	6	Good
Graft interposition	4	3 Good
		1 Hospital mortality
Died during surgery	1	Died
Died while awaiting surgery	3	Died
<b>Total</b>	<b>24</b>	

## DISCUSSION

The story of aneurysm in Nigeria is an evolving one. The first case of aneurysm reported in Nigeria was by Thomas in 1956<sup>1</sup>. Since then there have been several reported cases of aneurysms<sup>2, 6, 9, 10, 12</sup>. Our number of 26 cases is the largest collection so far, giving an incidence of 2.6 per year.

Trauma is still the major cause of aneurysm in our environment as was previously reported.<sup>1, 3, 4, 7, 8, 11</sup> Traumatic aneurysm is a late complication of vascular injury both in Nigeria and worldwide<sup>1, 3, 11, 14, 15, 17</sup>. Being commonest in our locality is not only an indication of the inadequacies in the management of vascular injuries but also of increasing violence in our nation. This may not be unrelated to the economic down turn and high level of unemployment. These days gangs of armed robbers and university undergraduate secret cult members use guns and other sharp objects to attack their victims. Also civil disturbances are common and the rioters freely employ knives, bows and arrows with the result that penetrating injuries that affect the blood vessels occur. In all these situations the late complication is pseudo aneurysm. However, with improvement in diagnosis and availability of highly skilled surgeons, it is expected that traumatic aneurysm will gradually decline. This happened during the Korean War. At that time a skilled military surgeon, Frank Spencer started, repairing injured blood vessels. This expectation will only be met if there is no brain drain of these surgeons to other parts of the world.

Our study revealed one case of iatrogenic femoral artery aneurysm. Aneurysms complicating iatrogenic injuries have been reported by other authors<sup>14, 15, 16</sup>.

In many centres in developed and technologically advanced countries iatrogenic aneurysms follow catheter angiography. This complication is rare in our practice due to limited angiographic procedures being done. Moreover, other interventional vascular procedures are also rare in our practice. These procedures include access for intra aortic balloon pump (IABP) placement, carotid, coronary and aortic artery stenting. An arteriovenous fistula (AVF) creation and arteriovenous graft (AVG) insertion for chronic haemodialysis in end stage renal disease patients are other causes of aneurysms.

Traumatic pseudo aneurysms were commoner in the younger age group with a male: female ratio of 4:1. The very mobile nature of these male youths put them at greater risk than any other age group. This is similar to the report of Adeyemi-Doro<sup>11</sup>, but differs significantly from 12:0 of Anyanwu et al<sup>8</sup>. Majority of the traumatic aneurysms in our study (9 out of 16 or 56.0%) occurred in the lower limbs and mainly in the femoral artery, as was the observation of others<sup>7, 8, 17</sup>.

All but one of the true aneurysms in our study occurred in those older than 50 years of age. The infra-renal abdominal aorta had 5 out of 8 (62.5%) of these true aneurysms. The only thoraco-abdominal aneurysm belonged to Crawford Type III classification<sup>18</sup>. This number is nowhere near the results from more

advanced countries and points to the fact that aneurysmal disease has been reported to be rare in Nigerians<sup>19</sup>. We think it is under diagnosed having done this work. There is need to carry out an extensive, recent and accurate study to verify the true situation. There had been many of such reports in different areas of life in the past, which were later discarded because they did not reflect the reality on the ground. One of such reports was that Nigerians do not suffer from heart disease.<sup>20, 21</sup> Hospital based report contains only those who could visit the hospital. The life style of the people is changing and atherosclerosis is increasingly seen among the populace. Smoking of cigarettes is common. Separate and combined incidences of hypertension and diabetes mellitus are on the increase. These are risk factors. Many cases of sudden death in this environment are never investigated forensically to find out the cause. It is now known that major cardiovascular event is a leading cause of sudden death in developed countries. This was made known from the results of researches into this problem. Nowadays, carotid endarterectomy, coronary artery bypass and aneurysm repair surgeries are being carried out routinely and electively in asymptomatic patients who have been diagnosed with any of the lesions on routine annual health checks. This is because deaths do occur prior to the stage of any symptom. The relevance of this is that we can treat our people in the light of current knowledge.

All our patients with abdominal aortic aneurysm and the one with thoraco-abdominal aneurysms were hypertensive. Whether this is cause or effect is difficult to say but hypertension has been noted to be present in about two-thirds of patients with abdominal aortic aneurysm<sup>22</sup>. Lowering of blood pressure with drugs is part of the control mechanism while waiting for definitive treatment of aneurysm.

As was noted by Anyanwu et al<sup>8</sup> we have had to rely mainly on clinical acumen for the diagnosis of peripheral aneurysm as most of the patients could not afford angiography. This is a pointer to the serious deficiencies in the health sector. The federal government of Nigeria is the sole proprietor of federal tertiary health institutions. The current policy does not favour curative treatment for non-communicable diseases. The non-invasive ultrasonography has become our main investigative modality for abdominal aneurysms. The efficacy of this has been elegantly highlighted<sup>19</sup>.

Although our number of abdominal aortic aneurysm is small, it is important to point out that our patients are not only symptomatic but also harbour very large diameter aneurysms. This is noteworthy as the risk of rupture and death increases with increase in the size of the aneurysm<sup>13, 23</sup>.

These patients do not undergo routine regular medical examination but some will eventually present to the doctor because of symptoms.

Our overall operative mortality of 9.5% may not be bad considering the prevailing circumstances<sup>18, 22, 23</sup>. Our situation is such that if nothing is done to the patient

death will inevitably ensue sooner or later but carrying out the surgery gives an opportunity for long-term survival. Nevertheless, with improvement in diagnosis and supportive services, this figure can still be lowered. Furthermore, with availability of prosthetic vascular grafts more of our patients with abdominal and thoracic aortic aneurysms will be salvaged. Presently the cost of the imported prostheses is high and not affordable for most of the patients. There is no health insurance to help in financing the hospital bill and these things are priced in foreign currency, which is far stronger than the local one.

## CONCLUSION

Aneurysms may not be uncommon among Nigerians. Currently the majority are traumatic pseudo aneurysm. True aneurysms especially infra-renal abdominal aortic aneurysm is being increasingly identified. A high index of suspicion, appropriate and timely referral, and improved funding of the health care delivery facilities will contribute to better management of this lesion.

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