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RETROSPECTIVE ANALYSIS OF RUPTURED ABDOMINAL AORTIC ANEURYSM PATIENTS - INSTITUTIONAL EXPERIENCE

Vascular Surgery

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ABSTRACT

Abdominal aortic aneurysm (AAA) is a common and life-threatening disease that affects mainly people over the age of 50 years. AAA is more common in smokers with a positive family history of aortic aneurysms, history of trauma or Infection. Most patients with AAA are often asymptomatic. Rupture, the most common complication of AAA, is one of the most fatal surgical emergencies. This study seeks to explore the demography, clinical features, post-operative complications and mortality.

KEYWORDS

Abdominal aortic aneurysm, asymptomatic, surveillance.

INTRODUCTION:

Ruptured Abdominal Aortic Aneurysm (rAAA) is one of the fatal surgical emergencies, with an overall mortality rate of 90%. Most AAAs rupture into the retroperitoneal cavity, which results in the classical triad of pain, hypotension, and a pulsatile mass. However, this triad is seen in only 25–50% of patients and many patients with ruptured AAA are being misdiagnosed.

The risk of AAA dramatically increases in the presence of the following factors: age >60 years, smoking, hypertension and family history. The likeliness of an aneurysmal rupture is influenced by the aneurysm size, expansion rate, continued smoking, and persistent hypertension.

Abdominal ultrasonography is considered as the screening modality of choice for detecting AAAs because of its high sensitivity and specificity, its safety and relatively lower cost. For the detection of additional 3D anatomical details, CT abdomen and Angiography may be needed.

Management options for patients with an rAAA include Endovascular Aneurysm Repair (EVAR) and/or open surgical repair, depending upon the status of the patient at the time of admission and his underlying co-morbidities.

MATERIALS AND METHODS: -

All the enrolled patients in the study were admitted and underwent open surgery for infra diaphragmatic rAAA in the "Institute of Vascular Surgery", Madras Medical College, Chennai from 1st June 2016 to 30th May 2019. We obtained data regarding outcomes from the follow-up registers at the 1st and 6th-month post-operative follow-up, with the last case being followed up till September 2019.

Demography, clinical features, risk factors, and postoperative mortality of rAAA were analysed.

Patients with non-rAAA and Thoraco Abdominal Aortic Aneurysms (TAAA) were excluded from the study.

Results: -

A total of 18 patients were enrolled in the study, with the median age group of 58 years (45-65) and male: female ratio of 3:1. Analysis revealed hypertension as one of the major risk factors (61%), with 39% of patients being heavy smokers and 28% of patients having coronary artery disease (CAD).

The predominant symptom and signs were pain abdomen (89%) and pulsatile abdominal mass (72%) respectively.

Most of the patients were naïve (67%) with the predominance of a fusiform aneurysm (78%) and possessing a maximum aneurysmal diameter of 90 mm. Predominant post-op complications were renal failure (33%) followed by hemorrhage (28%) with a postoperative 30-day mortality rate of 44%.

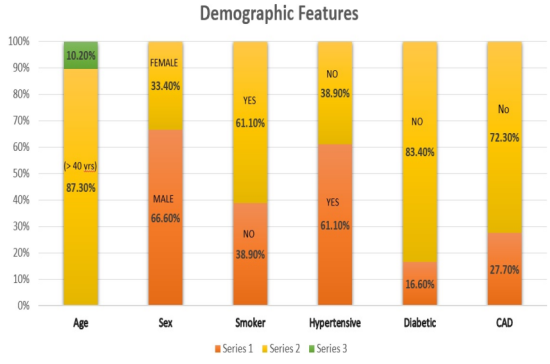

Fig 1. Distribution of Demographic features

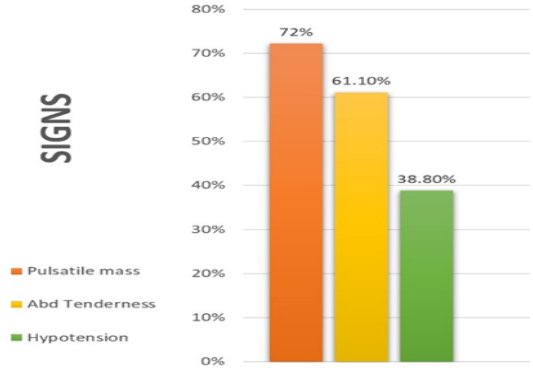

Fig 2. Distribution based on Signs.

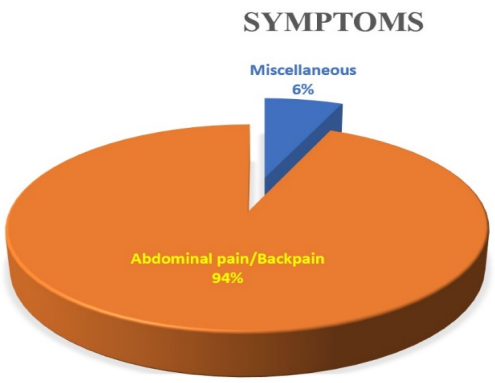

Fig 3. Distribution of Symptoms

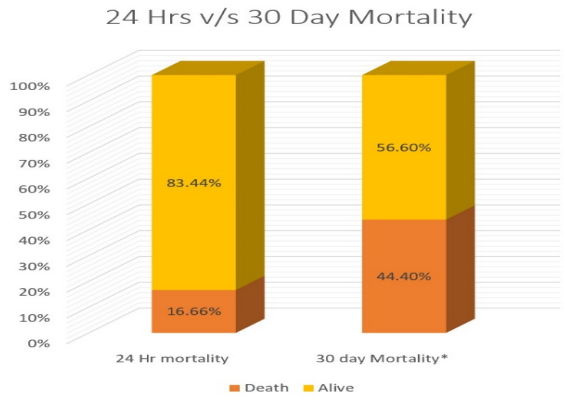

Fig 4. Distribution of Early Post-op Mortality

Table 1: - Results of the study

Sl. No	Parameter	Number	Percent
1.	Type of case:		
	a. Naïve patients	12	67%
	b. Old patients	06	33%
2.	Shape of aneurysm:		
	a. Fusiform	14	78%
	b. Saccular	04	22%
3.	Size of aneurysm sac:		
	a) < 5cms	01	5.5%
	b) 5 – 7 cms	07	38.8%
	c) > 7 cms	10	55.5%
4.	Postoperative complications:		
	a. Renal failure (RF)	06	33%
	b. Hemorrhage	05	28%
	c. Pulmonary complications	05	28%
	d. Bowel ischemia	01	5.5%
	e. Surgical Site Infection	04	22%
	f. DVT of Lower limb	03	17%
	g. Prosthetic graft infection	01	5.5%

DISCUSSION: -

Abdominal Aortic Aneurysm (AAA) is defined as an aortic diameter of 1.5 times that of the normal diameter. The risk of AAAs increases dramatically after 60 years of age. AAAs are four to five times more common in men than in women.

Besides, AAAs develop in women approximately 10 years later than in men.

Smoking is a major risk factor for an aneurysm formation. The association with smoking was directly related to the number of years of smoking and this association had a higher significance in women than in men with flattening of the curve seen after cessation of the smoking.

Majority of the patients in this study are in the age group of 40 – 70 years, with a male-to-female ratio of 2:1. Males predominated our study population probably due to the fact that most of them were smokers [7 patients (40%)], with >10 years of smoking history and females possessing the advantage of estrogen hormonal protection in delaying atherosclerosis and hence degenerative AAA.

Several meta-analyses of prospective studies have explored the association between hypertension and AAA and the results have been consistent with reports showing a statistically significant positive association. Though there are contradicting reports, many epidemiological studies paradoxically highlighted an inverse relationship between diabetes and AAA.

CAD is a major risk factor for AAA. Evidences suggest an increase in prevalence of CAD with the severity of AAA. Recent myocardial infarction (MI) and unstable angina are major risk factors for postoperative mortality and thus stabilising the underlying CAD is prudent before surgery. There was a significant association between hypertension and rAAA in our study with 11 patients (61%) being hypertensive and above 50 years of age. There were 3 diabetic patients in our study, however a statistically significant association between diabetes and AAA was not observed.

In our study 5 patients (28%) presented with CAD along with other comorbidities and unfortunately out of them 4 patients expired postoperatively which harbingers the need of timely surveillance.

Most AAAs rupture into the retroperitoneal cavity, which results in the classical triad of pain, hypotension and a pulsatile mass. As this triad is seen in only 25–50% of patients, the ruptured AAA may be misdiagnosed. Different sites of rupture of AAA likely to determine a variety of common and uncommon clinical presentations, the acknowledgment of which can preserve many lives. Increased early mortality has been reported in the symptomatic patients compared to asymptomatic AAA.

In our study, 67% of patients are naïve i.e., they presented to the emergency room (ER) for the first time with no previous diagnosis or admissions regarding similar complaints and this suggests the predominance of the disease without major alarming symptoms until it ruptures.

Abdominal pain or back pain were the major complaints (90%) of our patients. Even though the pain at presentation was minimal, subsequent progression of its severity was observed. Intermittent claudication, vomiting, loin pain, and dyspnoea are the less common symptoms which constitute only 6%. Major presenting signs were pulsatile abdominal mass (72%), abdominal tenderness (61%) and hypotension (39%).

The shape of the aneurysms is either fusiform or saccular. Fusiform aneurysms represent a generalised increase in the entire diameter of the affected vessel, while saccular aneurysms are more localised and often eccentric. Some saccular aneurysms and pseudoaneurysms are eccentric defects arising from a focal ulcer or weakness in the arterial wall, because of trauma or infection.

In our study, 16 cases (78%) were fusiform with degenerative (atherosclerotic) etiology followed by 5 cases of saccular aneurysms. The diameter of the aneurysm sac in our study population varies between 4.8cm and 11.1 cm.

Patients with associated comorbidities should get a good preoperative assessment to minimise perioperative complications. Postoperative renal failure was seen in 33% of patients in our study and half of them had to undergo hemodialysis. The main contributing factors of this Renal Failure were supra celiac cross-clamping, cross-clamping time >30 minutes, and pre-existing renal dysfunction.

Intra- and postoperative hemorrhage occurred in 28% of patients in our study. Fortunately, re-exploration was required in only one patient and the rest of the patients were treated conservatively.

The pooled mortality in the randomised trials showed a nonsignificant mortality difference at one year of 38.5% for EVAR versus 42.8% for open repair. Our study had a mortality of 8 patients (44%) out of which 3 patients (16%) expired within 24 hrs of post-op and the remaining 5 patients expired within 30 days of post-op period with acute cardiac events being the most common cause of death.

CONCLUSION: -

Elective surgical repair of an AAA before rupture is the desired outcome and saves lives. Since most of the individuals with an AAA have no symptoms and found incidentally. Clinicians should, therefore, adopt a low threshold of suspicion for rAAA and a quick referral to the vascular surgeon is expected. The identification of impending or contained rupture using imaging modalities is important because these patients are at risk for frank rupture.

The risk of aneurysmal rupture increases with increasing diameter, rapid expansion, symptomatic aneurysm and history of smoking. Cessation of smoking, management of risk factors and the use of statins might have a significant role in rAAA reduction and hence should be considered in developing countries like India where routine screening surveillance programs are cumbersome. Early surgical intervention is recommended for all symptomatic aneurysms and asymptomatic aneurysms greater than 5 cm in diameter.

Regular surveillance through imaging studies should be conducted in asymptomatic aneurysms ≥ 4cm in size. However, our most ambitious goal in the near future remains the translation of the growing body of knowledge involving the biological mechanisms of aneurysm formation, growth, and rupture into an effective medical therapy for the high-risk beneficiaries.

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