

CLINICAL OUTCOME OF AORTIC SADDLE EMBOLISM – A 10 YEARS' EXPERIENCE

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ABSTRACT:

Objectives: To analyse the outcome of aortic saddle embolism (ASE) in patients reporting late to the vascular surgeon.

Study design: Descriptive analytical study

Place and Duration of study: Department of Vascular Surgery, Combined Military Hospitals Lahore, Gujranwala, Kharian and Quetta from March 2006 to March 2016.

Methodology: Data of all the patients with aortic saddle embolism were analyzed for demographic characteristics, co morbidity, surgical intervention performed and outcome in terms of limb salvage and revision procedures.

Results: A total of 36 patients were managed during the study period. Thirty (83.3%) patients reported to us six days after the onset of symptoms. Of the total 36, thirty (83.3%) patients had paralysis at the time of presentation. Bilateral femoral embolectomy under local anaesthesia was performed in thirty (83.3%) patients. Three (8.3%) patients underwent open exploration of distal aorta. Amputation rate was 58.3% while 8.3% patients died.

Conclusion: Successful management of ASE include high index of suspicion for an early diagnosis, timely referral to and surgical intervention with adequate perioperative anticoagulation.

Key words: Embolus, Aorta, Anticoagulation, Embolectomy

INTRODUCTION:

Arterial embolism is a relatively common clinical problem, familiar to both the general and vascular surgeons. The most lethal form of peripheral embolism is aortic saddle embolism which presents as a large thrombus, a collection of atherosclerotic debris or a tumour particle which originates within the proximal circulation; and terminates so as to straddle the aortic bifurcation thus producing bilateral lower extremity arterial obstruction that can lead to serious hemodynamic and metabolic consequences.¹⁻³ Rest pain and motor and/or sensory deficits are main complaints in such patients. Preoperative angiography has a little role in planning the surgical approach to

patients with ASE.⁴ Early embolectomy and anticoagulation are the main stay of treatment. Morbidity and mortality remain high even with bilateral femoral embolectomy with Fogarty catheter, due to comorbid conditions and late reporting to hospital.^{5,6} This study was conducted to document experience of managing patients with ASE so as to find out predisposing condition, clinical presentation and outcome.

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METHOD AND MATERIALS:

The data of all the patients with ASE managed from March 2006 to March 2016 at various Combined Military Hospitals namely Lahore, Gujranwala, Kharian and Quetta were analysed. The records were reviewed for demography, surgical intervention and outcome. After initial evaluation and assessment, all patients received an intravenous bolus dose of 5000 units of unfractionated heparin, followed by a continuous infusion of heparin at rate of 1000 units per hour. Preoperative Doppler scan was performed in all patients. Preoperative angiography was performed only in patients with doubtful diagnosis.

Patients were operated on with full heparinization and antibiotic prophylaxis. Retrograde embolectomy was performed using 5Fr Fogarty Catheter under local anaesthesia. Per-operatively vessels were flushed with heparinized saline after a good flow was established. Postoperatively, heparin infusion in a dose of 1000 units per hour was continued for at least five days to maintain the partial thromboplastin time (PTT) two times above its normal limit of 35-42 seconds. Warfarin was also started at a dose of 5mg a day from postoperative day one. On fifth day, International Normalised Ratio (INR) was measured and heparin infusion was stopped once the target INR of 2.5-3.0 was achieved. All patients were discharged on lifelong warfarin therapy. Regular monthly follow up for first six months and then yearly follow up for next five years was done.

Data was entered into statistical package for social sciences (SPSS) version 20. The numerical outcome like age and hospital stay was calculated as mean and standard deviation. Gender was recorded as frequency and percentage.

RESULTS:

A total of 36 patients were managed during the study period. Baseline characteristics of the patients are given in table I. Twenty four (66.6%) patients had previous history of cardiac disease. This included 12 (33.3%) patients of valvular heart disease, 3 (8.3%) of dilated cardiomyopathy, 6 (16.6%) with atrial

fibrillation and 3 (8.3%) with atrial myxoma. There were 9 (25%) patients with diagnosed peripheral vascular disease (PVD). In these 9 cases, 3 (8.3%) had an aorto-femoral bypass grafting done in past and 6 (16.6%) were conservatively treated for PVD. Twenty seven (75%) patients had renal failure at the time of admission with us. Of these, 6 (16.6%) went on permanent haemodialysis.

Rest pain and numbness were the main symptoms in almost all the patients. At the time of presentation 30 (83.3%) had motor paralysis and established tissue necrosis was present in 15 (41.7%) cases. Thirty (83.3%) patients presented after a delay of 6 days from the time of onset of symptoms. All these patients reported to the nearest doctor within first 6 hours. Of these; nine (30%) patients were initially managed conservatively by physicians as a case of mechanical backache and later on referred to vascular surgeon with paralysis, twenty one (58.3%) patients were referred to neurosurgery units where they were initially evaluated and treated for cauda equina. Three of these patients were operated as a case of lumbar disc prolapse and later referred to vascular surgeon once bilateral gangrene developed.

Due to late presentation only six (16.7%) patients were operated within 24 hours of onset of symptoms. Twenty seven (75%) patients were treated six days after embolization. Three (8.3%) patients with bilateral leg gangrene, who underwent surgery for a suspected disc prolapse, refused any further intervention.

Total number of patients (n)	36
Age (in years)	36.5 (30-55) 49 (+/- SD 5.2) years
Males	75% (27)
Females	25% (9)
Diabetes	33
Hypertension	9
Peripheral vascular disease	9
Hyperlipidemia	9
Smoking	21

Table 1: Baseline characteristics of the patients

Preoperative angiography was performed in 6 (16.7%) patients with doubtful diagnosis. In thirty patients retrograde embolectomy with 5Fr Fogarty catheter was performed through vertical arteriotomy in both common femoral arteries under local anesthesia. In 3 (8.3%) patients, distal retrograde femoral embolectomy was not successful as good flow was not obtained; hence they underwent endarterectomy of the distal aorta by direct trans-abdominal approach.

Of the 72 limbs at risk, 24 (33.3%) required amputations in 14 patients. In 9 (25%) cases, partial calf muscles activity returned after 2-3 months but anterior compartment remained paralyzed. Only 3 (8.3%) patients enjoyed their preoperative ambulatory status after embolectomy. In 30 (83.3%) patients, four compartments two incisions fasciotomy was performed at the time of embolectomy.

The mean hospital stay was 14 (+/- SD 2.5) days with a range from 9 to 21 days. Three patients who refused for any surgical intervention died next day in the hospital while three having cardiac tumour died more than 6 months after surgery. In 21 (58.3%) cases recurrent emboli occurred during follow up period which required revision embolectomy. Sites of recurrent emboli were saddle (n=3), iliac (n=9) and popliteal artery (n=9). All patients were maintained on permanent anticoagulation.

DISCUSSION:

ASE although infrequent, still represents the most common cause of acute aortic occlusion with its peak incidence in 6th decade of life.⁶⁻⁸ The most common source of embolus is heart in 96% cases.⁹⁻¹¹ Amongst this post myocardial infarction patients especially in the first 3 weeks, atrial fibrillation, mitral valve stenosis, and prosthetic valve replacement are common causes.¹²⁻¹⁵

The clinical presentation of ASE is extremely variable and depends on the degree of obstruction, the presence of propagated clots, distal emboli and extent of effective collateral circulation.⁴ Read et al found that onset of ASE symptoms has a gradual rather than abrupt course.¹⁴ The six "Ps" (pain, pallor, paresthesia, paralysis, pulselessness and perish to cold) are also observed in cases of ASE. Deterling et al observed that coolness and absent pulses are present in all patients, pain in 85%, paresthesia in 92% and motor deficit in 42% cases.⁴ Presence of paralysis is a bad prognostic sign, however it is often reversible.¹⁶

Before the advent of the Fogarty catheter surgeons either used a direct approach to abdominal aorta to re-establish blood flow or the condition was managed conservatively. The associated mortality and morbidity was quite high at that time.^{5,6,17} First successful open aortic embolectomy for ASE was reported in 1941.¹⁸ Haimovici et al reported high mortality when ASE was managed conservatively.⁵

Fogarty catheter has improved limb salvage by 80-90% in some series of peripheral embolism.^{3,19,20} It has considerably decreased the mortality rates and increased the chances of limb survival.²¹ Although the best results are obtained with early embolectomy but delayed embolectomy is also useful. Embolectomy done even after 2-3 weeks of onset of symptoms and in the presence of severe tissue ischemia still lowers the anatomical level of subsequent amputation.^{18,22} Complications related to catheter use occur in approximately 1% of patients.²³

Most of the current literature advocates the use of full anticoagulation once the diagnosis of ASE is made as this prevents further propagation of clot and obstruction of

collateral blood flow.^{3,11,21-24} Few studies have suggested that preoperative heparinization is of no benefit and may even precipitate embolization.^{10,14,18} All of our patients were started on standard dose of heparin once the diagnosis was made.

Postoperative anticoagulation in patients of embolic ischemia: whether to continue and for how long; is a debatable topic and the controversy is yet to be resolved in the literature. Elliott et al. in their study of 330 patients followed for 3.1 years suggested that permanent anticoagulation was associated with better survival and less recurrence.²⁵ All our patients received bridging therapy with perioperative heparin and were put on warfarin to achieve a target INR between 2.5 and 3.0. They were advised to continue warfarin lifelong.

CONCLUSION:

The key to successful treatment of ASE is early diagnosis, full anticoagulation in perioperative period, embolectomy, and maintenance of long-term oral anticoagulation in postoperative phase. Medical and paramedical health providers should have refresher courses regarding vascular emergencies to improve their ability for early diagnosis of such cases so that a prompt referral to a vascular surgeon can be made.

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VALUE OF A MAN DEPENDS UPON HIS COURAGE; HIS VERACITY DEPENDS UPON HIS SELF-RESPECT AND HIS CHASTITY DEPENDS UPON HIS SENSE OF HONOR.

Hazrat Ali (Karmulha Wajhay)