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Pulmonary Emboli Following Thrombectomy of Hemodialysis Fistula

Jahan Porhomayon*

Associate Professor, Anesthesiology and Critical Care Medicine, VA Western New York Healthcare System, Division of Critical Care, Department of Anesthesiology, State University of New York at Buffalo School of Medicine and Biomedical Sciences, New York

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Introduction

Hemodialysis graft or fistula occlusion is a common event that occurs frequently in patient with end stage renal disease. As a result, the vast majority of dialysis patients with arterio-venous graft/ fistula thrombosis undergo surgery for thrombectomy. Surgical approach and techniques include surgical thrombectomy, Pharmacomechanical, and Mechanical thrombectomy with surgical devices. Embolization could occur during extraction process and result in mild to severe cardio-respiratory complications

Discussion

The United States annual renal report in 2008 indicated that a total of 112,476 patients started ESRD therapy, and the ESRD population reached 547,982 including 382,343 dialysis patients [1]. The vast majority of these patient undergo surgery with interventional procedures for thrombosis of hemodialysis fistula/ graft in the USA [2,3].To restore flow, catheter intervention techniques have become the primary mode of restoring flow in about 80% of cases [4]. Complications arising from such interventions include bleeding, pulmonary embolism, vein rupture, cerebral embolism and arterial embolism [5,6], Massive pulmonary embolism remains the most feared complication intraoperatively [7]. Usually smaller emboli go unnoticed since cardio-pulmonary derangements are seldom seen, whereas large fragmented clots can result in potentially serious complications with cardiovascular collapse [8]. Pathophysiologic effects of Pulmonaru emboli (PE) include increase in pulmonary vascular resistance secondary to anatomical obstruction and release of vasoconstricting substances. Gas exchange is also impaired due to redistribution of blood flow leading to impaired ventilation/perfusion ratio and increased alveolar dead space [9]. Reflex stimulation and increase airway resistance and decreased lung compliance also plays a role [10]. The true incidences of PE following such procedures remain largely unknown. Studies have reported low incidence of PE from thrombectomy procedure of about 0 to 1.0%. Others have used pulmonary perfusion scintigraphy in pre and post thrombectomy patients to detect the PE. Swan et al looked at 31 patients with acute thrombosed hemodialysis fistula and performed perfusion scan in 22 patients [11]. Perfusion scans were positive in 59% of patients without any sign or symptoms of PE suggesting subclinical PE can occur frequently during thrombectomy procedure. Other investigators have also reported similar results [12-14]. Patients with previous history of compromised cardiopulmonary reserve will have less ability to compensate for hemodynamic derangement secondary to large PE [15]. Therefore the clinician should carefully prepare and evaluate the cardio- pulmonary systems for this procedure. Repeated thrombectomy procedures with subclinical PE could have cumulative effects on cardiopulmonary reserve and pose additional risk to the patient [11,15].

Conclusion

Massive PE during or after thrombectomy of the arteriovenous graft or fistula remains a serious but a rare event, clinicians must completely assess the cardiac and pulmonary reserve of the patient and be prepared to manage this catastrophic complication. Transesophageal echocardiography can play a role and is a useful diagnostic test for early diagnosis, risk stratification, and management of patient with large PE.

Conflict of Interest

None

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***Corresponding author:** Jahan Porhomayon MD, FCCP, FABHP, VA Medical Center, Rm 203C, 3495 Bailey Ave, Buffalo, NY 14215, USA, Tel: 716 862-8707; Fax: 716 862-8707; E-mail: jahanpor@buffalo.edu

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