Massive and Submassive Pulmonary Embolism: Initiation of a Multidisciplinary, Rapid Response Team

Brett J. Carroll, MD,[a] Heather Pemberton, MD,[b] Kenneth A. Bauer, MD,[c] Louis M. Chu, MD,[d] Jeffrey L. Weinstein, MD,[e] Barbara L. Levarge, MD,[f] Duane S. Pinto, MD, MPH[a]

[a]Division of Cardiology, [b]Department of Medicine, [c]Division of Hematology and Oncology
[d]Division of Cardiac Surgery, [e]Division of Interventional Radiology,
[f]Division of Pulmonology and Critical Care
Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA

Background: Pulmonary embolism (PE) can result in rapid clinical decompensation in many patients. With increasing patient complexity and advanced treatment options for PE, multidisciplinary, rapid response teams have optimized risk stratification and expedited management strategies.

Methods: The Massive And Submassive Clot On-call Team (MASCOT) was created at our institution which comprised of specialists from cardiology, pulmonology, hematology, interventional radiology, and cardiac surgery. MASCOT offers rapid consultation 24 hours a day with a coordinated web-based conference call to review primary patient data and discuss management of patients with high-risk PE. Consultation in patients deemed of low complexity is deferred. We reviewed patient data collected from MASCOT's registry to analyze patient clinical characteristics and outcomes and describe the composition and operation of the team.

Results: Between August 2015 and September 2016, MASCOT evaluated 72 patients. Seventy of the 72 patients were admitted to our institution, accounting for 32% of all patients discharged with a primary diagnosis of PE. The emergency department (ED) requested consultation in 80 patients, accounting for 45% of the 177 patients with a primary diagnosis of PE evaluated in the ED. Of those 80 patients, 34 were formally evaluated by the team. Consultation was deferred in the remaining 46 patients, none of whom died prior to discharge secondary to a PE. Overall, average age was 62±17 years with a female predominance (63%). Active malignancy (31%), recent surgery/trauma (21%), and recent hospitalization (24%) were common. PE severity was considered to be massive in 16% and submassive in 83%. Proximal emboli were present in 77% and right ventricular (RV) dysfunction was found with RV

enlargement on CT (69%) or echocardiography (76%) with RV hypokinesis in 68%. Anticoagulation alone was selected by the team in 65% (n=46). Systemic fibrinolysis was administered in 11% (n=8), catheter-directed therapy in 18% (n=13), extracorporeal membrane oxygenation in 3% (n=2), and an IVC filter was placed in 15% (n=11). Thirteen percent (n=9) experienced a major bleed with no intracranial hemorrhage. One of the 18 patients (6%) who received fibrinolysis had a major bleed. Overall survival to discharge was 89% (64% in those with massive PE and 93% in those with submassive PE).

Conclusions: Multidisciplinary, rapid response PE teams offer a unique coordinated approach to patient care. Further study is warranted to evaluate potential benefits of a team-based approach for PE to patients, clinicians, and healthcare systems.

Figure 1.