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Article in Press

Comparison of ASPIRE Mechanical Thrombectomy Versus AngioJet Thrombectomy System in a Porcine Iliac Vein Thrombosis Model

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DOI: <http://dx.doi.org/10.1016/j.avsg.2016.12.014>



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Abstract

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Background

Percutaneous mechanical thrombectomy device has become an important therapeutic armamentarium in the management of venous thromboembolism. In this study, we compare the efficacy and safety profile of the AngioJet thrombectomy device and ASPIRE thrombectomy system in a porcine venous thrombosis model.

Methods

Twelve adult pigs underwent bilateral iliac venous thrombosis created by using a stent graft thrombosis model and subsequently underwent either AngioJet ($n = 6$) or ASPIRE mechanical thrombectomy ($n = 6$) 1 week later. Intravascular ultrasound (IVUS) was used to assess thrombectomy efficacy, and computed tomography was used to evaluate pulmonary embolism (PE). Hemolytic effect was measured by plasma-free hemoglobin (PfHgb). Iliac vein thrombogenicity was evaluated with radiolabeled platelet and fibrin deposition. Veins were harvested and evaluated with light microscopy and scanning electron microscopy (SEM).

Results

Similar thrombectomy efficacy by IVUS evaluation was noted in both groups. Significant greater PE and hemolysis were identified in the AngioJet group compared to the ASPIRE group. The AngioJet group had greater reduction in WBC and platelet compared to the ASPIRE group. No difference was found in thrombogenicity, light microscopic evaluation, or SEM.