

JetStream Rotational Atherectomy for Treatment of Acute Lower Extremity Thrombosis: A Case Series

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Purpose:

Acute limb ischemia is associated with high mortality and amputation rates. Although catheter-directed thrombolysis (CDT) is the preferred treatment for acutely threatened limbs at our institution, it is resource intensive, requiring Intensive Care Unit (ICU) level care and repeat angiograms. Additionally, a patient may be a poor thrombolysis candidate. In the midst of the COVID-19 pandemic and its prevalence at our institution, an alternative revascularization treatment obviating ICU admission would be preferred. The Jetstream Rotational Atherectomy system (Boston Scientific) has established use for the treatment of chronic atherosclerotic disease. However, its use for acute thromboembolic events is not well established.

Materials and Methods:

A retrospective review was performed of all the primary rotational atherectomy procedures for acute lower extremity thrombosis between March 2020 and October 2021 at our institution.



Figure 1a - JETSTREAM™ Atherectomy System XC Device (Boston Scientific) features active aspiration and is also approved for thrombus removal.

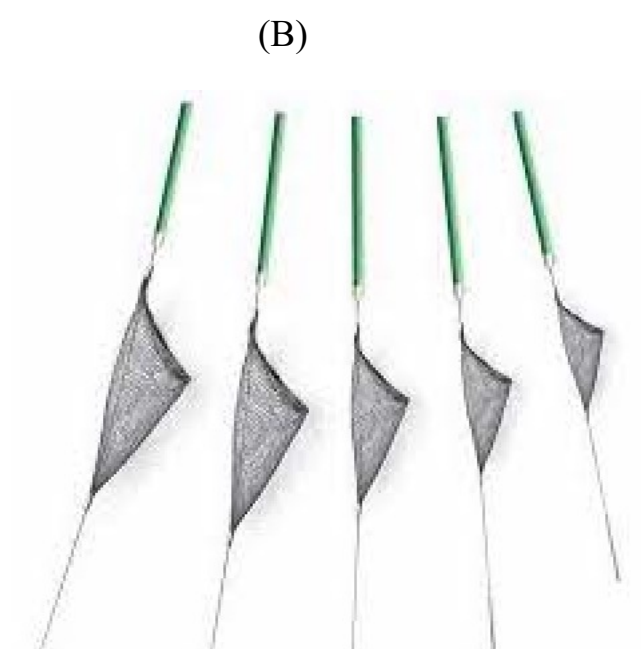


Figure 1b - The SpiderFX embolic protection device (Medtronic) is used as a guidewire and a distal embolic protection system which contains and removes embolic material while performing angioplasty and stenting procedures.

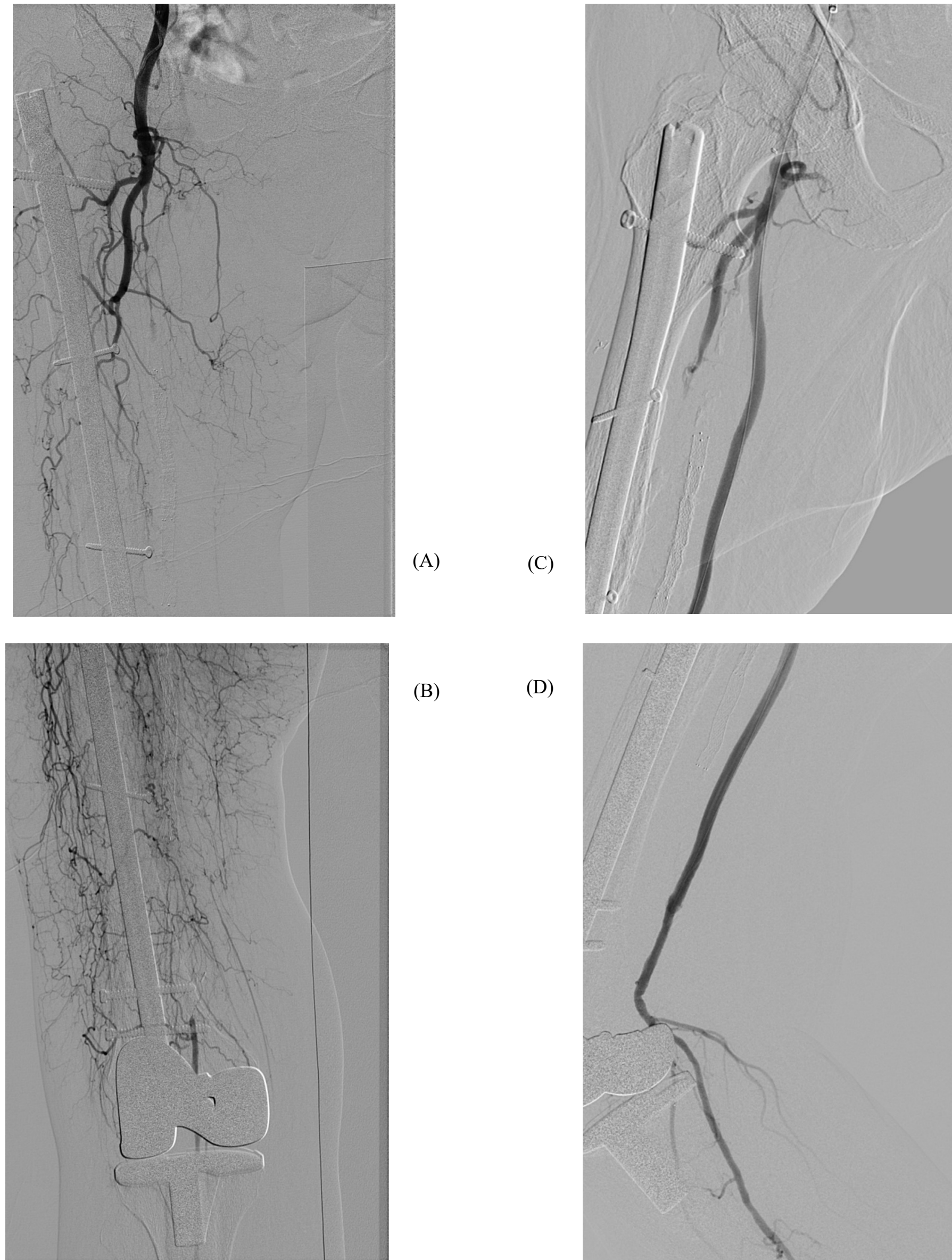


Figure 2: Angiogram images obtained before (A & B) and after (C & D) treatment of an acutely occluded femoropopliteal bypass graft with the Jetstream Rotational Atherectomy System. Images A & B demonstrate an occluded femoropopliteal bypass graft with increased collateral flow. Images C & D demonstrate significant restoration in blood flow after using the Jetstream Rotational Atherectomy System.

Results:

Twenty rotational atherectomy procedures were performed by four practitioners. The mean patient age was 67 years old with 10 female and 7 male patients. Ten patients had hypertension, 8 had diabetes, 3 had coronary artery disease and 14 were smokers. Angioplasty, stenting, or both were performed after atherectomy in 12 cases. Dissection occurred in 2 (10%) procedures and distal embolization in 3 (15%) procedures. Complications were treated with angioplasty, stenting, and/or suction thrombectomy. Thirteen cases resulted in direct patient discharge from the interventional radiology post-procedure department. Three patients were in the ICU before intervention. Subsequent CDT was performed for residual thrombus in 5 cases.

Conclusions:

Sixteen out of 20 threatened limbs were successfully treated with rotational atherectomy, with complications treated intra-procedurally. Based on our small case series, we believe rotational atherectomy can be effectively and safely used as a single-session intervention for the treatment of patients with acute lower extremity thrombosis, although additional interventions may be required.

Clinical Relevance/Application:

An alternative endovascular treatment that obviates CDT and hospital admission greatly impacts hospital resources. This is particularly true when ICU resources are limited because of the ongoing pandemic. Rotational atherectomy may be a treatment option for acute lower extremity thrombosis if limited hospital resources preclude CDT.

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