Radiofrequency Wire Recanalization of Chronically Occluded Venous Stents: A Retrospective, Single-Center Experience in 15 Patients

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INTRODUCTION

This retrospective study investigated the use of PowerWire® RF Guidewire in the recanalization of chronically occluded venous stents. While acute occlusions can often be managed with standard techniques, chronically occluded stents can present greater difficulties due to lesions made of dense fibrous tissue that can extend over long segments.

METHODS

15 patients with chronically thrombosed venous stents who underwent RF wire recanalization utilizing the PowerWire® RF Guidewire.

- Recanalization with the PowerWire® RF wire was performed after conventional and blunt recanalization techniques failed to cross the stent occlusion.
- RF termination was a common occurrence particularly in long or curved occluded segments like the pelvis. In these cases, the RF wire or catheter was exchanged for one with a different tip angle.
- If CVO traversal was successful balloon venoplasty was performed followed by placement of additional coaxial stents.

TECHNICAL SUCCESS

Traversing the stent occlusion and achieving anterograde flow restoration.

RESULTS

Technical success was achieved in 17 of 19 occlusions (89%) and clinical success was achieved in 14 of 15 patients (93%).

- In instances of initial technical failures, repeat procedures were performed, 1 with RF and one without, leading to successful outcomes.
- Stent occlusions had an average length of 14.6 cm.
- 63% of the 19 procedures relied solely on RF wire recanalization, while the remainder used a combination of sharp recanalization and RF wire techniques for recanalization.
- 1 minor complication attributed to extraluminal protrusion of the RF wire resulted in self-limited and asymptomatic focal extravasation requiring no treatment.
- 1 major complication arose in conjunction with sharp recanalization techniques attributed to focal transgression of the IVC, resulting in medical and surgical intervention.

Disclaimer: *this study includes both on-label and off-label use of the PowerWire® RF Guidewire. Before use, consult product labels and Instructions for Use for Indications for Use, Contraindications, Warnings, Precautions, Adverse Events and Directions for Use.*

DISCUSSION

RF wire recanalization is an efficacious adjunct for revising chronically occluded stents, particularly when standard techniques fail.

- The PowerWire® RF wire's ability to penetrate nearly any non-osseous structure is advantageous, particularly at the ends of stents where chronic occlusions tend to accumulate and obstruct access.
- Sharp recanalization techniques which rely on mechanical force are effective in crossing occlusions that are short and straight, but the applied force is dampened with increased distance or angulation.
- The PowerWire® RF wire's penetrative ability presents risks, such as extra-luminal passage, however because the generator terminates the energy pulse if the RF wire contacts metal, wire transgression through stent walls into adjacent structures is uncommon.
- Safety measures should include minimizing energy pulse duration and wire advancement distance to prevent inadvertent perforation.

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