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Case Report

# Laser Atherectomy as a Novel Revascularization tool in Chronic Venous Occlusion

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## Abstract

We describe a 66-year-old male who was complaining of worsening left leg sweeling and pain due to chronic bilateral common femoral venous occlusion due to prior abdominal surgery fifteen years ago. He was treated by endovascular intervention where novel endovascular recanalization of the ilio-femoral veins using balloon venoplasty with adjunctive use of Laser atherectomy safely and effectively was demonstrated.

**Keywords:** leg swelling; venogram; venoplasty; laser atherectomy; chronic venous occlusion; case report

## Introduction

An estimated 100 persons per 1 00,000 each year are newly diagnosed with venous thromboembolism in the United States 1, Of these, about two-thirds have acute deep venous thrombosis (DVT) while one-third have pulmonary embolism (PE) [1]. In addition to significant mortality [2], both conditions are associated with a number of morbidities that may be prevented when prompt endovascular intervention is performed. Over 30% to 40% of patients with DVT may suffer from post thrombotic syndrome (PTS) after lower extremity DVT3. Chronic DVT has also been a target of intervention in patients with venous claudication or in those with venous ulcers. Unfortunately, currently tools to treat chronic venous disease are limited to Balloon venoplasty, and stent placement. Laser atherectomy (with the same procedural technique as used in peripheral artery disease), has not been used before in chronic DVT.

Although the procedure was conducted safely, possible complications (as in arterial angioplasty) include perforation, abrupt closure, and embolization.

## Case Presentation

A 66-year-old man was presented with gradually worsening bilateral legs swelling, left more than right associated with pain and tightness in both limbs. Patient had past medical history of coronary artery disease, tobacco use, hypertension, hyperlipidemia, cardiomyopathy, chronic hepatitis C and atrial fibrillation. He underwent abdominal surgery 15 years ago, and at that time his postoperative course was complicated by sepsis which mandated bilateral common femoral veins access for venous catheters placement.

Venous Doppler ultrasound revealed severe venous insufficiency with chronic occlusion of both common femoral veins. This most likely developed due to common femoral veins access and catheters placement during his previous abdominal surgery.

Bilateral venogram was done along with right lower venous intravascular ultrasound (IVUS). Left common femoral vein and the left external iliac vein were chronically occluded. Right common femoral vein and right external iliac vein were severely stenosed (figure IA and IB).

Venogram and IVUS of the Inferior Vena Cava (IVC), common iliac veins, external iliac veins, and common femoral veins was performed (figure IIA and IIB). Then, venoplasty with laser atherectomy was successfully performed to the right common femoral vein.

Left side venogram with intravascular ultrasound was performed via left popliteal vein access. The left common femoral vein occlusion was revascularized initially using balloon venoplasty, but the severe fibrotic

lesion led to significant recoil and restenosis (figure III). Laser atherectomy of left common femoral vein was performed to modify the lsion (figure IV A) and further balloon venoplasty then resulted in significant luminal gain (figure IV B).

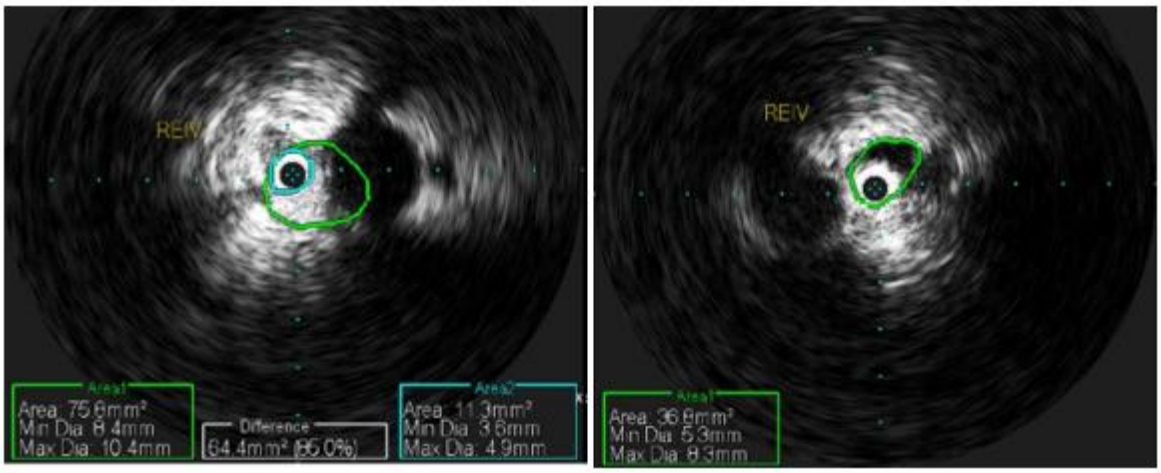


**Figure 1A and B:** intravascular ultrasound showing severe stenosis of right external iliac vein

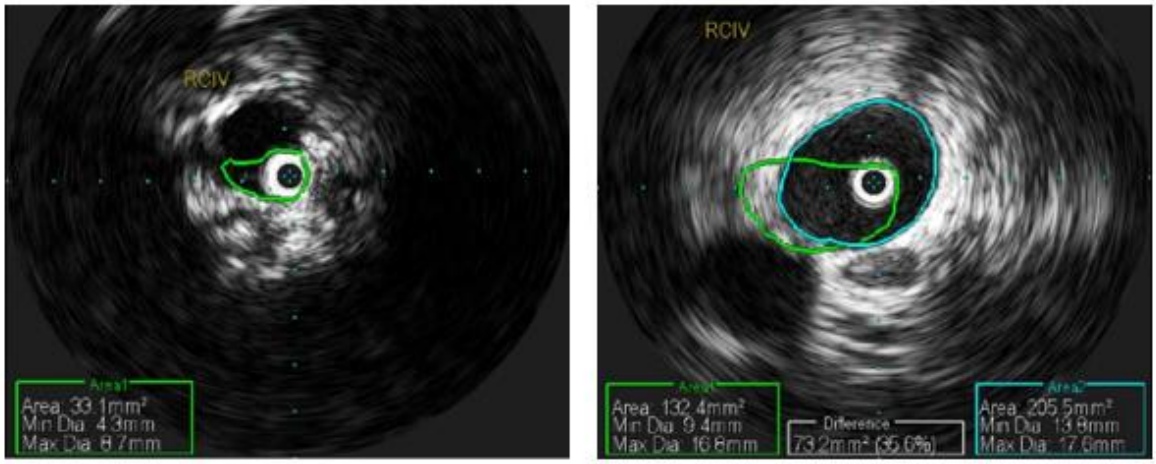


**Figure II A and B:** intravascular ultrasound of right common iliac vien (pre and post laser atherectomy and valvoplasty)

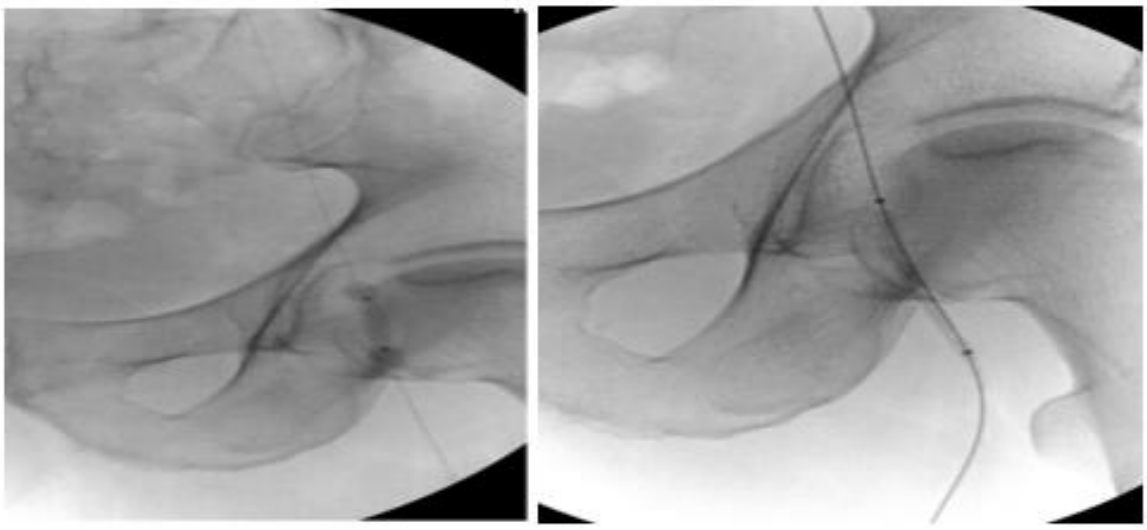

**Figure III:** wire access and venoplasty of left common femoral vien with recoil results.

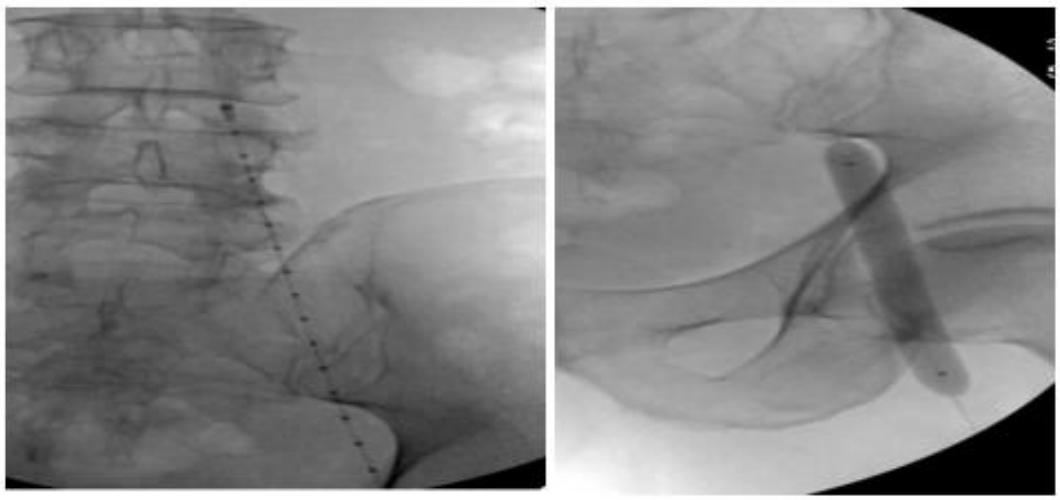

**Figure IV:** A Laser Atherectomy (Turbo elite Philips) for left common femoral vein, B balloon venoplasty for left common femoral vien with significant luminal gain.

## Discussion

One third of the patients with DVT may suffer from post thrombotic syndrome (PTS) after lower extremity DVT [3], Chronic DVT has been a target of endovascular intervention in patients with venous claudication or in those with venous ulcers. Unfortunately, currently tools to treat chronic venous disease are limited.

Chronic venous occlusion has not had the share of peripheral arterial disease regarding therapeutic options. Endovascular interventions have been successfully applied in the treatment of peripheral artery disease [4]. In addition to the balloon angioplasty other modalities to modify stenosis and plaque including various types of atherectomy devices are being used and tested for improving long-term outcome. Among the various atherectomy devices, laser atherectomy offers the theoretical advantages of eliminating stretch injury on the arterial walls and reducing the rate of restenosis [5-8]. Laser-assisted extraction of pacemaker leads from the subclavian veins has been used with high success and low procedure-related complications [9,10]. This case demonstrates the successful novel use of laser atherectomy to tackle recanalization of chronic venous occlusion.

## Conclusion

Laser atherectomy can be used safely and effectively for chronic peripheral venous occlusions as an adjunct to balloon venoplasty.

## References


1. White RH. The epidemiology of venous thromboembolism. Circulation 2003; 107(23 suppl 1):14-18.
2. Lindblad B, Eriksson A, Bergqvist D. Autopsy-verified pulmonary embolism in a surgical department: analysis of the period from 1951 to 1988. Br] Surg 1991 ;78(7):849-852.
3. Kahn SR, Ginsberg jS. Relationship between deep venous thrombosis and the postthrombotic syndrome. Arch Intern Med 2004;164( 1):17-26.
4. Harman RL, Jazaeri O, Yi J, Smith M, Gupta R. Overview of classification systems in peripheral artery disease. Semin InterventRadiol 2014;31;378-388.
5. Katsanos K, Tepe G, Tsetis D, Fanelli F. Standards of practice for superficial femoral and popliteal artery angioplasty and stenting. Cardiovasc InterventRadiol 2014;37:592-603Dr.shafiq
6. Deloose K, Bosiers M, Callaert J, Verbist J, Vermassen F, Scheinert D, et al. Primary stenting is nowadays the gold standard treatment for TASC II A & B iliac lesions: the definitive MISAGO 1-year results. J Cardiovasc Surg (Torino) 2017;58:416-421.
7. Ott I, Cassese S, Groha P, Steppich B, Hadamitzky M, Ibrahim T, et al. Randomized comparison of Paclitaxeleluting balloon and stenting versus plain balloon plus stenting versus directional atherectomy for femoral artery disease (ISAR-STATH) clinical perspective. Circulation 2017; 135:2218-2226.
8. Garcia LA, Lyden SP. Atherectomy for infrainguinal peripheral artery disease. J EndovascTher 2009;16:II105-115
9. Kyobugeka. Concurrent Surgical Venous Repair during Laser-assisted Pacemaker Lead Extraction The Japanese Journal of Thoracic Surgery, 01 Mar 2022, 75(3):163-168
10. Simon Pecha, Heiko Burger, Da Un Chung, Viviane Möller, Tomas Madej, AlaaMaali, Brigitte Osswald, Raffaele De Simone, NadejaMonsefi, VirgilijusZiaukas. EP Europace, Volume 24, Issue 10, October 2022, Pages 1627–1635

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