1085 **Successful Complete Endovascular Revascularization for Extensive Chronic Limb-Threatening Ischemia utilizing extreme intravascular ultrasound-guided approach**

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Case Description:

An 87-year-old woman with a history of diabetes was referred to our hospital for chronic limb-threatening ischemia (CLTI) with ulceration of the left lower extremity. Preprocedual enhanced CT and diagnostic angiography at the referring institution revealed left iliac stenosis with severe calcification, and long total occlusion from left superficial femoral artery (SFA) to below-the-knee arteries, and endovascular therapy (EVT) was planned at our hospital.

Given the complexity of the lesions, treatment was performed in four separate sessions.

Session 1:

Puncture was performed via the right common femoral artery (CFA), and lower limb angiography revealed 90% stenosis in the left common iliac artery (CIA) and left CFA, along with chronic total occlusions (CTO) of the SFA to the popliteal artery, anterior tibial artery (ATA), and posterior tibial artery (PTA).

Although insertion of a 6Fr Crossroads sheath via the right CFA was difficult, a 6Fr sheath was successfully inserted via the left CFA. IVUS showed circumferential calcification in the CIA, and a VBX 7.0/39 mm stent was deployed. Two bare-metal stents were also implanted in the external iliac artery (EIA), and balloon dilatation of the left CFA was performed to prepare for future access site.

Session 2:

Access was again obtained from the right CFA. Due to a steep bifurcation angle of the iliac artery, advancing a 7Fr Destination sheath to the contralateral side was challenging, but was accomplished using balloon anchoring.

Severe tortuosity limited guidewire control. A Crosslead Tracker was advanced using a knuckle technique, and AnteOwl IVUS confirmed subintimal tracking and media entry from the SFA ostium.

Under IVUS guidance, we attempted intraplaque redirection using ICHIBANYARI and Astato 9-40, but lesion hardness prevented passage even with Crosslead Penetration 18. A 4 mm balloon was used to dilate the lesion proximal to the SFA, however the guidewire passage remained difficult.

An Eluvia 6.0/150 mm stent was implanted from the SFA ostium, and a Parent Select 5082 sheath was inserted via the left CFA. Using Astato 9-40 and Crosslead Penetration, we advanced intraplaque to the P2 segment, but severe calcification at P2 required knuckle crossing with Gladius MGES. IVUS showed deviation into the media, necessitating reentry.

Using Conquest Pro 12ST, re-entry from subintimal to intraplaque space was achieved at P2, and access to the ATA was established. Eluvia 6.0/40mm and Supera 6.0/150mm were deployed from the distal SFA to P2, ensuring a single straight-line flow.

Session 3:

EVT for the PTA CTO was performed via an ipsilateral approach. A Parent Select 5082 sheath was inserted, and IVUS from the peroneal artery was used to visualize the PTA ostium.

Under IVUS guidance, a Gladius wire was advanced into the ATA. The guidewire reached mid-PTA, but severe calcification at the proximal PTA prevented microcatheter advancement. Modification using a Wingman 35 enabled catheter tracking.

The Crosslead Tracker was advanced to the distal PTA using the knuckle technique. IVUS showed that the wire had deviated into the subintimal space at mid-PTA. Intraplaque re-entry was achieved with Astato 9-40. Although the wire deviated again at the level of the common plantar artery, it was redirected into the true lumen with Gladius MGES. Balloon dilatation of the PTA to plantar artery resulted in satisfactory angiographic outcome.

Session 4:

EVT for the ATA was performed via left CFA access. A Parent Select 5082 sheath was inserted, and a Corsair PV and Crosslead Tracker were advanced retrogradely from the PTA through the pedal arch.

At the distal ATA, the wire quickly exited the vessel, prompting a switch to an antegrade approach. Using IVUS from the peroneal artery, the ATA ostium was identified. Under IVUS guidance, a Halberd was advanced, and the ATA CTO was crossed using Gladius MGES with the knuckle technique. However, IVUS confirmed that the wire had entered the extravascular space at mid-ATA.

Intraplaque re-entry was achieved with Astato 9-40 and Conquest Pro 12ST. After stepping down to Gladius, the wire was advanced to the overlapping point with the retrograde wire.

IVUS revealed that the antegrade wire was in the subintimal space, and the retrograde wire had exited the vessel. Antegrade re-entry was deemed unfeasible, however retrograde re-entry was successfully performed with Astato 9-40 and Conquest Pro 12ST. Reverse CART and rendezvous were achieved, followed by balloon dilatation with favorable final angiographic results.

Conclusion:

This case illustrates the successful revascularization of complex, multi-vessel CTOs in an elderly diabetic patient with CLTI through the multi-session EVT strategy incorporating antegrade, retrograde, and re-entry techniques including Reverse CART and IVUS guided wiring.