

CASE SPOTLIGHT



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Minimally invasive endovascular treatment (EVT) achieving low complications with high success rates has been performed extensively in recent years. Nonetheless, lesion calcification continues to pose challenges during EVT procedures due to 1) difficult device crossing and 2) insufficient lumen expansion.

JADE, a non-compliant balloon catheter with extra-long Rx tracking lumen, has been shown to be particularly helpful in resolving these issues with optimal results as illustrated in the following 2 reported case studies.

CASE STUDY 1

A Case of Intermittent Claudication in which Endovascular Treatment was Performed in a Stenotic Superficial Femoral Artery with Severe Calcification and Obstruction

CASE DETAILS

- Male patient in his 60s
- Intermittent claudication of the gastrocnemius muscle in both limbs (Rutherford Stage 3)
- Risk factors included hypertension, dyslipidemia, and former smoking
- Evaluation of arteries of lower extremities:
 - Stress ABI exam: Right: 0.41 to 0.33
 - Imaging by CTA revealed severe calcification in most of the arteries in the lower extremity [Fig. 1] but with no lesion in the iliac artery
 - 99% stenosis with severe calcification at proximal right SFA with a severely calcified occluded segment of 7 cm at P1 [Fig. 2]
- Target lesion: Right femoropopliteal artery
- Approach: Left femoral artery crossover (6F Parent Plus sheath, 45 cm, MEDIKIT)
- Guidewire used: Command 14 (Abbot Vascular Japan)
- JADE balloon catheters used: 4.0 x 120 mm, 5.0 x 80 mm

PROCEDURE

A 45cm 6F Parent sheath was inserted into the right common femoral artery. Due to severe calcification, a 6F straight type guiding catheter and Fencer microcatheter were selected for extra support in wiring and device delivery. Upon successful guidewire crossing nearly past the calcified segment at the proximal site, the Fencer also advanced successfully past the P1 segment of the occluded stump. However, the guiding catheter could not be advanced past the stump due to obstruction by the calcium. Under the circumstance, a 4.0 x 120 mm JADE balloon was selected and it successfully passed the lesion site, enabling the advancement of the guiding catheter to also pass the obstruction stump. The JADE balloon was dilated to 18 atm but without rupturing despite severe lesion calcification. The same method was applied to successfully advance the Command wire through the occlusion followed by dilatation of the entire lesion using the same JADE balloon. As illustrated by the arrows [Fig. 3 and 4] from the left to right sequence, the severely calcified lesion which could not be fully opened at nominal pressure was resolved at 18 atm. To complete the case, a 7.0 x 120 mm MISAGO stent was placed at the proximal site, after which the stent and the entire lesion site were further post dilated with a 5.0 mm x 80 mm JADE [Fig. 5] to show achieve full stent expansion and perfusion ([Fig. 6].

Fig. 1

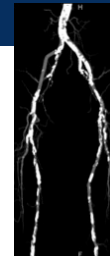


Fig. 2

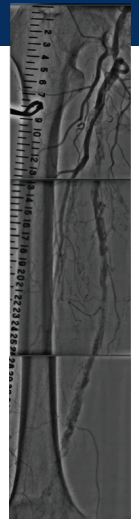
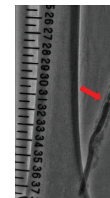
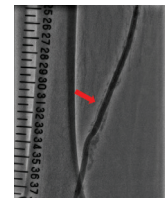


Fig. 3



Balloon inflation at 14 atm



Balloon inflation at 18 atm

Fig. 4



Balloon inflation at 14 atm



Balloon inflation at 18 atm

Fig. 6

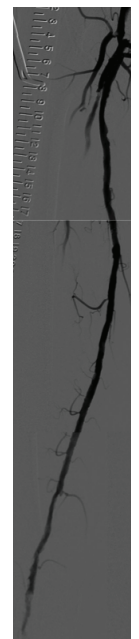
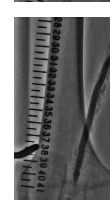
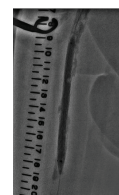
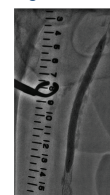


Fig. 5



▼ CASE STUDY 2

Critical Limb Ischemia in a Restenosed and Severely Calcified Below-the-Knee Lesion 2 Months after Previous Treatment

CASE DETAILS

- Male patient in his 70s
- Ulcer (Rutherford Stage 5) at the right big toe
- Risk factors: hypertension, diabetes, smoking, and chronic renal failure (dialysis maintenance)
- Evaluation of arteries of lower extremities:
 - Stress ABI exam: Right: 0.78
 - SPP exam: Dorsum of the right foot (32 mmHG) and sole of the right foot (15 mmHG)
 - Severe calcification found in all ranges of the lower extremities and BTK arteries [Fig. 1]
 - Imaging showed restenosis from the intermediate to distal site of the regio cervicales anterior iliac artery [Fig. 2]
- Target lesion: Right anterior tibial artery
- Approach: Right femoral artery antegrade needling (4.5F Parent Plus sheath, 55 cm, MEDIKIT)
- Guide wire: Cruise (Asahi Intecc)
- JADE balloon catheter used: 2.5 x 120 mm

PROCEDURE

A 4.5F sheath was inserted via antegrade approach, followed by crossing of a Cruise guidewire through the dorsal artery of the foot from the anterior tibial artery. In the previous case, attempt to fully open the calcific lesion using a 2.0 mm competitor semi-compliant balloon failed, during re-treatment, the 2.5 x 120 mm JADE balloon which was delivered with ease achieved full expansion at 16 atm. [Fig. 3]. The same balloon was inflated twice (each at a 3-minute interval) and the procedure was completed without any delayed post-procedural imaging vascular dissection [Fig. 4].

Fig. 1



Fig. 2

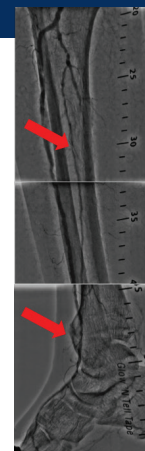
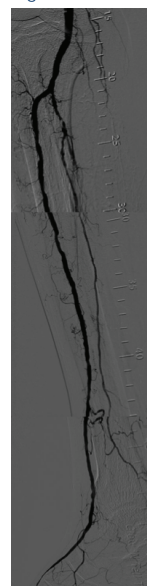


Fig. 3



Fig. 4



DISCUSSION

This case was presented with early restenosis from the previous procedure due to insufficient balloon expansion using a 2.0 mm semi-compliant balloon. Given the condition and presence of severe calcification, delivery of a standard rapid exchange balloon down the bend to access the proximal site of the anterior tibial artery would probably have been difficult. However, thanks to the added guidewire support from a longer tracking lumen, the JADE balloon was delivered with ease despite its larger 2.5 mm diameter and achieved full expansion at 16 atm. In daily practice, BTK treatment is very limited to ballooning (POBA), and how the lumen is maintained at the acute stage is an important attribute to wound healing. In this case study, excellent healing was achieved from the combination of JADE's ease of deliverability and non-compliant dilatation to keep the lumen open.

CONCLUSION

The JADE balloon catheter has high delivery performance with the longer guidewire tracking lumen. Also, it has the uniform extended force of a non-compliant balloon. It is a very reliable balloon especially for dialysis patients.