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TITLE

Rate and predicting factor related to successfully crossing chronic total occlusion in the femoropopliteal lesion of peripheral arterial disease the real-world data

BACKGROUND

Crossing chronic total occlusion (CTO) in femoro-popliteal (FP) arteries poses a persistent challenge, often requiring advanced techniques. While the primary catheter-wire technique is commonly employed, data on success rates without a crosser device remain limited. This study aims to present real-world data from our center, focusing on the catheter-wire complex recanalization technique and analyzing predictive factors for CTO crossing failures.

METHODS

This single-center retrospective study included peripheral arterial disease (PAD) patients with CTO in FP arteries with Rutherford classification 3-6 undergoing endovascular recanalization between 2017 and 2022. The primary objective was to determine the success rate of crossing CTO in FP segment, with the secondary objective being the evaluation of factors associated with CTO crossing failure.

RESULT

Among the 181 analyzed patients, the majority exhibited minor tissue loss (n=114, 63%). Most had severe disease, the Trans-Atlantic Inter-Society Consensus Document (TASC II) category D, and Global limb anatomic staging system (GLASS) grade 4 (n=123, 68.5%), with chronic total occlusion crossing based on plaque cap morphology (CTOP) type B being most common (n=121, 66.9%). Severe CTO calcification (peripheral arterial calcium scoring system [PACSS] type 4) was present in 23.8% (n=43) and the median occlusion length was 16.1 cm (Interquartile range [IQR] 7.3-27.2 cm). Approximately 85.6% of patients successfully crossed the CTO, with the antegrade approach yielding success in 57.5% (n=104). For cases where the initial antegrade attempt failed, the retrograde approach demonstrated an additional success rate of approximately 66.2% (n=51). Factors associated with higher CTO crossing failure included CTOP type C or D (Odds Ratio [OR] 3.77, 95% CI 1.45-9.81, p=0.006), CTO at the P3-popliteal artery (PA) (OR 4.6, 95% CI 1.53-13.85, p=0.007), severe CTO calcification (OR 3.57, 95% CI 1.23-10.66, p=0.019), and underlying dyslipidemia (DLP) (OR 2.94, 95% CI 1.15-7.51, p=0.024). Retrograde recanalization demonstrated increased success in crossing CTOP type D (23.5% versus 12.5%, p=0.002) and longer occlusion lengths (median 20.8 cm versus 9.8 cm, p<0.001).

CONCLUSIONS

Using catheter-wire escalation technique with complex recanalization technique/approach is safe and effective to cross majority of CTO. Presence of CTOP type C or D, CTO at P3-PA, severe CTO calcification, and underlying DLP are associated with crossing failure. The retrograde approach facilitates easier crossing in CTOP type D and longer CTO.

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