

Efficacy and Safety of Intravascular Lithotripsy in the Treatment of Calcified Peripheral Artery Disease: A Systematic Review and Meta-Analysis

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Introduction: Intravascular lithotripsy (IVL) is a novel endovascular calcified peripheral artery disease (PAD) therapy technique. Data regarding IVL clinical utility for PAD remain sparse. We aimed to evaluate the safety and efficacy of IVL in managing calcified PAD.

Methods: A comprehensive literature search (PubMed and Embase) through November 2020. Studies evaluating the clinical outcomes of IVL use in the management of calcified PAD. Primary outcomes: IVL delivery success rate, pooled mean of acute lumen gain, minimal lumen diameter (MLD), and residual stenosis. Secondary outcomes: 30-day major adverse effects (MAEs), (dissection, perforation, thrombus formation, and distal embolization rates). Meta-analyses were conducted using a random-effect model.

Results: 7 studies (503 patients; 605 lesions). IVL success rate=99.6% (95% CI: 0.991-1.002). Pooled mean acute lumen gain=2.745 mm (95% CI: 1.826-3.664). Minimal diameter (MLD)= 4.017 (95% CI: 2.910-5.123). Mean residual stenosis (MRS) = 21.737 mm (95% CI: 17.749-25.724). 30-day MAE rate=0.018 (95% CI: -0.002-0.038), including dissection rate = 0.03 (95% CI: -0.003-0.047) and perforation rate = 0.004 (95% CI: -0.001-0.009). No studies reported embolization or thrombus formation.

Conclusion: IVL is an effective and safe technique in managing calcified PAD, achieving significant improvement of acute lumen gain and low 30-day MAEs. However, further studies with large sample sizes are needed to determine the long-term efficacy and safety of IVL in PAD.