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Superior Short-Term Patency of Stents Over Balloons in Infrapopliteal Artery Disease

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Purpose

The optimal strategy for revascularization in below-the-knee (BTK) chronic limb-threatening ischemia (CLTI) remains debatable. High restenosis rates of percutaneous transluminal angioplasty (PTA) often warrants re-intervention or amputations. Novel devices such as drug-eluting (paclitaxel) balloons (DEB), stents, and atherectomy devices- directional (HawkOne, SilverHawk, TurboHawk)™ or orbital (DiamondBack 360)™ are used infrequently as therapy when BTK. We aim to compare the rate of total re-occlusion between these interventions.

Material & Methods

A retrospective chart review of 97 patients who underwent BTK percutaneous intervention in 2015-2020 at our hospital. Descriptive statistics were used to assess the distribution of variables; continuous variables (time to readmissions) were summarized as mean values with standard deviations, and categorical variables were summarized as counts and percentages.

Results

Out of the 97 patients, 73.4% met documented Rutherford category V-VI on initial admission, 53.6% patients were readmitted to our facility with Rutherford category IV-VI at 8 +/- 8 months from initial intervention, 79.7% were diabetic and 62.5% were hypertensive. Interventions performed on the 208 arteries were plain balloon angioplasty 57.7%, DEB 2.9%, atherectomy with adjunctive PTA (A+PTA) 28.8%, stent 8.7% and atherectomy with adjunctive stent (A+S) 2.9%. Of the stents placed, 13 were bare-metal stent (BMS) and 11 drug-eluting (everolimus) stent (DES).

Within 12 months from initial intervention, total re-occlusion post PTA occurred at 4 (+/-3) months, A+PTA 3.7 (+/-2) months, and stents 8 (+/-3) months ($p= 0.015$, $F= 4.6$). Comparing stents, restenosis was 53.8% in BMS versus 18.2% in DES ($p= 0.09$) at 6 (+/-3) months readmission. Re-occlusion rates 30 months from initial intervention were 58.1% for uncoated balloons, 33.3% A+PTA, 60% DEB, 50% stents and 50% A+S ($p= 0.27$). 22 patients were not readmitted again for any reason. Of the 17 patients who underwent major amputation (below or above the knee), 10 had triple-vessel involvement below the knee, 4 had osteomyelitis. Restoring straight-line flow in angioplasty was unsuccessful in 10 cases.

Conclusion

These preliminary data suggest superior short term (< 1-year) patency of stents over PTA and A+PTA, BTK. Re-occlusion in A+PTA may be lower than PTA alone. DES seems to have better patency than BMS. Further studies needed to compare clinical outcomes.