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Factors associated with recurrent cephalic arch stenosis and impact of banding procedure on patency rates

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Objectives: Despite the widespread use of conventional percutaneous transluminal angioplasty (PTA), recurrent stenosis and unacceptable primary patency rates occur frequently. We aimed to identify risk factors for cephalic arch stenosis (CAS) recurrence and evaluate effect of banding procedure in CAS.

Methods: : In 1,118 angiographies of 231 patients with CAS, outcomes were analyzed in terms of primary, primary assisted, and secondary patency rates after PTA. The ratio of the largest cephalic vein diameter to the cephalic arch diameter was calculated (CV_CA ratio). Cephalic arch was trisectioned and location of stenosis was determined either proximal or non-proximal. An endovascular banding procedure was performed in cases (n=37) of recurrent CAS (>3 times/year) with high access flow (>1.5 L/min). The effect of banding procedure was evaluated in terms of primary patency rate, changes in the access flow rate (AFR), and number of events per access-year.

Results: At 3, 6, and 12 months, the cephalic arch primary lesion patency was 64.7%, 41.4%, and 24.8%, respectively. High CV_CA ratio (Hazard ratio [HR], 1.425; 95% confidence interval [CI], 1.041-1.951) and involvement of proximal segment (HR, 1.773; 95% CI,1.177-2.671) were significant risk factors for developing recurrent CAS. CV_CA ratio positively correlated with AFR ($r = 0.264$, $p = 0.01$). The banding procedure significantly reduced the AFR and the number of events per access-year ($t = 3.299$, $p = 0.005$, $t = 2.113$, $p = 0.042$, and respectively). Primary patency rates after banding was superior than that before banding ($p = 0.01$).

Conclusions: High CV_CA ratio and involvement of proximal segment of the cephalic arch are independent risk factors associated with recurrent CAS. Endovascular banding might improve outcomes in recurrent CAS.