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Artery to fistula diameter ratio as a predictor of early re-occlusion of immature arteriovenous fistulas after balloon angioplasty.

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Objectives: Successful maintenance of arteriovenous fistula (AVF) is an integral part in hemodialysis (HD) centers. An AVF failing to mature after operation is considered as 'immature' fistula, which usually requires percutaneous transluminal angioplasty (PTA). This study aimed to determine predictive factors which affect the patency of immature fistulas after the initial intervention.

Methods: We retrospectively reviewed the records and angiographic images of patients who had immature fistulas and thereby received angioplasty between years 2013 to 2016 at our center. There were 80 eligible patients with 22 brachiocephalic (BC) and 58 radiocephalic (RC) AVFs. Recurrent stenosis within 90 days of the intervention was defined as 'early failure'.

Results: The median age of the patients was 64 years [range, 38-87]. There were 51 (63%) males and 29 (36%) females. Comparing the data of RC (n=58) and BC AVFs (n=22), the RC group had older age of fistula at primary PTA, less events of coronary diseases and smaller artery to fistula diameter (A/F) ratio. Among the 58 RC AVFs, 10 (17%) were grouped as early failure. A/F ratio was the sole independent predictor of early failure after primary PTA (odd ratio 2.29 [1.023-5.147], P=0.044). Kaplan-Meier analysis showed that the total survival outcome of the early failure group was comparable to the patent group.

Conclusions: In this study, A/F ratio was a potential predictor of early failure in immature fistulas after primary PTA. After the primary intervention, total survival time of the AVF was comparable between the early failure group and patent group. Further studies in a larger scale are warranted to better elucidate and confirm the risks.