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Outcomes of angioplasties in arteriovenous fistulae/grafts – a single centre tertiary care renal unit experience in the UK.

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Introduction
The arteriovenous fistula (AVF) is the preferred choice of access for providing haemodialysis (HD). It offers better blood flow rates and has less risk of infections as compared to HD catheters. However, AVFs develop neo-intimal hyperplasia leading to stenosis that occurs from an inflammatory cytokine drive and oxidative stress of dialysis due to vessel wall shear/stress (Hammes, 2015). Early detection and intervention of stenotic lesions are essential to prevent HD access loss. Fistulogram +/- fistuloplasty remains a mainstay of intervention to rescue HD access (Schmidli et al., 2018).

Methods
Data were retrospectively collected from the electronic databases of the departments of radiology and nephrology on renal access angiogram studies performed between April 2016 to April 2017 [378 days]. Analyses were done by MS Excel 2003.

Results
148 fistulograms were performed in 125 patients; 72 were male (M:F=72:54). There were 120 AVFs and 28 arterio-venous grafts (AVGs). The average age was 68.25 yrs (range 26-89 yrs; median 70 yrs). 42% were performed in diabetic patients. Ultrasound Doppler was performed before intervention in all cases and identified 122 cases of stenosis alone, 7 cases of thrombosis alone and 13 cases of combined stenosis and thrombosis. In 33 cases, multiple stenoses were detected. The stenoses were predominantly in left-sided AVF/AVG[L:R = 100:48]. The anatomical sites of access were 42 radio-cephalic, 69 brachio-cephalic, 19 brachio-axillary, 13 brachio-basilic, 3 brachial vein transpositions and 2 axillo-axillary grafts. Seven cases were in pre-dialysis patients. 11 cases had central stenotic lesions that required stent insertion. Successful balloon angioplasty was performed in 141 cases.
The patency rates at various time points are shown in table 1. At 4 weeks, 131 cases had patent dialysis access. At 3 months, 107 cases had patent dialysis access, and at 12 months, 71 were patent.

Discussion
End-stage kidney disease [ESKD] is recognised to be an inflammatory state. Well functioning vascular access is vital for providing adequate HD and maintaining the patency of HD access remains a challenge. Fistuloplasty is an essential intervention for stenotic AVF/AVGs. In our study, at the end of one year, around 40% of the AVF/AVG are non-functional. More than a third of the cases needed repeat angioplasty of AVF to maintain patency and if we are going to be able to ensure that we deliver on what we believe is the right choice of access (AVF/AVG) for patients, investment in interventional radiology is key to a successful outcome.