A 70-year-old woman was admitted with chest pain and hypertension. Her systolic blood pressure had been measured at >160 mm Hg on multiple occasions despite treatment with 4 antihypertensive medications. Selective renal angiography demonstrated bilateral beaded appearance, right greater than left, consistent with fibromuscular dysplasia (Figure, A). Imaging with intravascular ultrasound showed that the proximal vessel was normal (Figure, B), whereas the mid-vessel had an intraarterial membrane (arrow) with evidence of 2 distinct lumens (Figure, C). A comparison of pressure distal in the right renal artery (measured using a 0.014-in pressure wire) with aortic pressure showed peak systolic and mean transrenal pressure gradients of 24 and 9 mm Hg, respectively (Figure, D). Angioplasty performed using a 6-mm balloon resulted in interruption of the membrane (Figure, E) with resolution of the pressure gradient (Figure, F). Medial dysplasia, which results in the “string of beads” appearance on angiography, is the most common form of fibromuscular dysplasia in adults. Thickened fibromuscular membranes are common.

This case demonstrates that interruption of membrane(s) with balloon angioplasty can improve renal hemodynamics and suggests a mechanism to explain the therapeutic effect of balloon angioplasty in medial dysplasia.
Angiography of right renal artery performed in anteroposterior projection (A). Transrenal pressure gradient measured before (D) and after (F) balloon angioplasty. Intravascular ultrasound imaging performed of proximal section (B) and mid-section (C, E) of right renal artery.
Renal Fibromuscular Dysplasia
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