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Bilateral Renal Artery Stenosis Due to Fibromuscular Dysplasia Presenting as Resistant Hypertension in a Young Adult: A Case Report and Literature Review

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Abstract **Case Report**

Background: Fibromuscular dysplasia (FMD) is a rare, non-atherosclerotic, non-inflammatory vascular disease that predominantly affects young individuals, especially women. It is an important but underrecognized cause of secondary hypertension. ***Case Presentation***: We report the case of a 28-year-old man with no prior medical history who presented with severe hypertension discovered incidentally during evaluation for headaches. Despite triple antihypertensive therapy, blood pressure remained poorly controlled. Laboratory tests were unremarkable, and there was no evidence of end-organ damage. Renal Doppler ultrasound and CT angiography revealed bilateral renal artery stenosis consistent with fibromuscular dysplasia. The patient underwent successful percutaneous transluminal balloon angioplasty of both renal arteries without stent placement. Post-procedural follow-up showed significant blood pressure improvement, allowing reduction to monotherapy. Doppler ultrasound controls at 1, 3, 6 months, and annually thereafter confirmed sustained patency without restenosis. ***Conclusion***: This case highlights the importance of considering FMD in young patients with resistant hypertension. Early diagnosis and intervention can result in excellent clinical outcomes without the need for stenting.

Keywords: Fibromuscular Dysplasia, Renal Artery Stenosis, Resistant Hypertension, Percutaneous Transluminal Angioplasty, Young Adult.

INTRODUCTION

Fibromuscular dysplasia (FMD) is a rare vascular disorder characterized by abnormal cell proliferation within the arterial wall, leading to stenosis, aneurysm, or dissection. The renal arteries are most commonly affected, and the disease typically presents with hypertension, particularly in young patients. Although often unilateral, bilateral renal artery involvement can occur and may contribute to severe or resistant hypertension. This report describes a case of bilateral renal artery stenosis due to FMD in a young adult male, successfully managed with balloon angioplasty.

CASE PRESENTATION

A 28-year-old man with no significant past medical history presented with persistent headaches. Blood pressure readings were markedly elevated, prompting further evaluation. Despite triple antihypertensive therapy, his blood pressure remained poorly controlled, with systolic values persistently above 160 mmHg.

The patient had no signs or symptoms suggestive of hypertensive organ damage. Routine blood tests, including serum creatinine, potassium, and estimated glomerular filtration rate, were within normal limits.

Renal Doppler ultrasound demonstrated bilateral renal artery stenosis. Findings were confirmed by CT angiography, which revealed the classic "string-of-beads" appearance of fibromuscular dysplasia involving both renal arteries.

The patient was admitted to the catheterization room for further evaluation. Selective renal artery angiography was performed, confirming bilateral multifocal stenosis of both renal arteries consistent with medial type fibromuscular dysplasia (Fig.1).

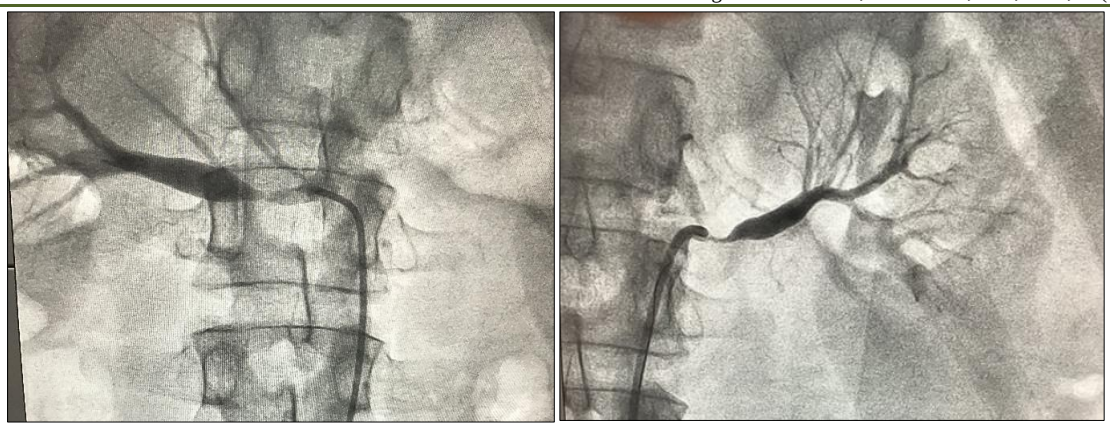

Figure 1: Selective renal arteries angiography showing bilateral stenosis

He subsequently underwent successful bilateral percutaneous transluminal angioplasty using balloon dilation alone, without stent placement. The procedure was uneventful, and angiographic results post-dilation showed satisfactory revascularization of both renal arteries. (Fig 2, 3).

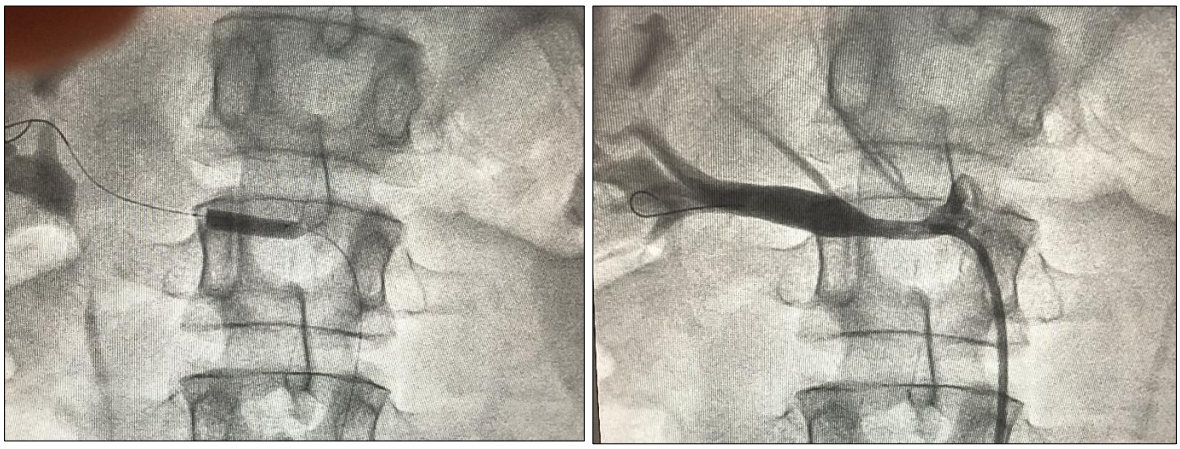

Figure 2: Successful balloon angioplasty of the right renal artery

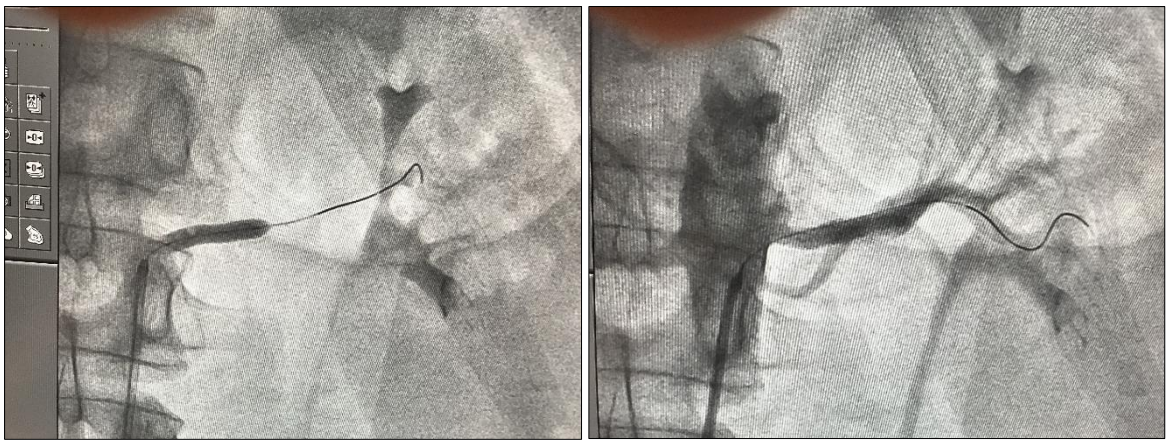

Figure 3: Successful balloon angioplasty of the left renal artery

Following angioplasty, blood pressure progressively improved. The patient was gradually weaned down to a single antihypertensive agent. Follow-up at 1, 3, and 6 months, and then annually, included blood pressure monitoring and renal Doppler ultrasound. These assessments showed stable blood pressure control and no evidence of restenosis or complications.

DISCUSSION

Fibromuscular dysplasia (FMD) is an idiopathic, segmental, non-atherosclerotic and non-inflammatory vascular disease that primarily affects medium-sized arteries. The renal arteries are involved in approximately 60–75% of cases, making FMD a leading cause of secondary hypertension, especially in young

individuals with no conventional cardiovascular risk factors [1,2]. Although FMD is more common in women, affecting them in over 90% of reported cases, it can also occur in men, as illustrated in our case [3].

The classic angiographic hallmark of medial FMD, the most common subtype, is the "string-of-beads" appearance resulting from alternating areas of stenosis and small aneurysmal dilatations. Bilateral renal artery involvement is seen in approximately 25–30% of renal FMD cases and is associated with more severe hypertension and a higher likelihood of requiring intervention [4].

Diagnosis is typically based on imaging, with CT angiography (CTA) or MR angiography (MRA) as initial modalities. However, catheter-based digital subtraction angiography (DSA) remains the gold standard, especially when endovascular treatment is considered [5].

In terms of management, percutaneous transluminal angioplasty (PTA) without stenting is the first-line therapy for patients with hypertension and evidence of hemodynamically significant renal artery stenosis due to FMD. Unlike atherosclerotic renal artery disease, in which stenting may be beneficial, stenting is generally avoided in FMD due to increased risk of complications and lack of added benefit [6].

The U.S. FMD Registry, which includes data from over 400 patients, reported that patients undergoing angioplasty for renal FMD had blood pressure improvement in up to 80% of cases, with 30–50% achieving normotension without medication [7]. Similarly, a study by Mousa *et al.*, reported a high technical success rate of PTA in renal FMD, with significant long-term clinical benefit [8].

Our patient demonstrated typical features of renovascular hypertension due to bilateral renal FMD: young age, resistant hypertension, absence of biochemical abnormalities, and no atherosclerotic risk factors. His excellent response to bilateral angioplasty, with reduction to monotherapy and sustained clinical stability, aligns with previously published outcomes and further supports the benefit of endovascular management in appropriately selected cases.

Regular follow-up with Doppler ultrasound is essential to monitor for restenosis, which, although rare, may occur. Our patient's serial imaging at 1, 3, and 6 months and then annually showed no restenosis, confirming the durability of angioplasty in FMD.

CONCLUSION

This case underlines the importance of considering fibromuscular dysplasia in young patients with resistant hypertension. Bilateral renal artery involvement, though less common, should not be overlooked. Balloon angioplasty without stenting can provide significant clinical improvement and long-term vascular stability.

REFERENCES

1. Olin JW, Gornik HL, Bacharach JM, *et al.*, Fibromuscular Dysplasia: State of the Science and Critical Unanswered Questions: a scientific statement from the American Heart Association. Circulation.2014;129(9):1048–1078.
2. Persu A, Giavarini A, Touze E, *et al.*, European consensus on the diagnosis and management of fibromuscular dysplasia. J Hypertens 2014;32(7):1367-78
3. Warchol-Celinska E, Prejbisz A, Dobrowolski P, *et al.*, Systematic and multidisciplinary evaluation of fibromuscular dysplasia patients reveals high prevalence of previously undetected fibromuscular dysplasia lesions and affects clinical decisions: the ARCADIA-POL study. Hypertension 2020;75 (4):1102-9.
4. Slovut DP, Olin JW. Fibromuscular Dysplasia. N Engl J Med. 2004;350(18):1862–1871.
5. ASTRAL Investigators;Wheatley K, Ives N, *et al.*, Revascularization versus medical therapy for renal-artery stenosis. N Engl J Med 2009;361(20):1953-62
6. Trinquart L, Mounier-Vehier C, *et al.*, Efficacy of revascularization for renal artery stenosis caused by fibromuscular dysplasia: a systematic review and meta-analysis. Hypertension. 2010;56(3):525–532.
7. Olin JW, Froehlich J, Gu X, *et al.*, The United States Registry for Fibromuscular Dysplasia: Results in the First 447 Patients. Circulation. 2012;125(25):3182–3190.
8. Mousa AY, Campbell JE, Stone PA, *et al.*, Short- and long-term outcomes of percutaneous transluminal angioplasty/stenting of renal fibromuscular dysplasia over a ten-year period. J Vasc Surg. 2012 Feb;55(2):421-7.