

Percutaneous Renal Denervation (RDN), is an Innovative Strategy in the Control of Refractory Blood Pressure. A Case Report.

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Abstract

Arterial hypertension (HBP) is a heterogeneous disease characterized by having a high degree of morbimortality in patients who suffer from it. Clinically it is diagnosed by taking blood pressure (BP) 1, when a value equal to or higher than 130/80 mmHg is obtained. Among its classification there is "Refractory Arterial Hypertension" 4-5 which has a low incidence but with a high cardiovascular risk and costs to the health system. Given its high impact, minimally invasive strategies have been created that have had a significant effect in reducing blood pressure levels; this procedure is called Percutaneous Renal Denervation (RDN) 6-7.

Keywords: arterial hypertension; adult; refractory; renal denervation; treatment

Introduction

Hypertension (HBP) is a heterogeneous pathology, generated by damage to the vascular endothelium, which leads to an increase in peripheral vascular resistance and is reflected in an increase in BP. From a quantitative point of view, HBP is defined as a sustained elevated BP. The guidelines of the American College of Cardiology, the American Heart Association, and a number of related societies and institutions (ACC/AHA 2017) have defined Hypertension as BP levels equal to or greater than 130/80 mmHg 2-3.

This pathology continues to be the leading cause of morbidity and mortality worldwide, affecting more than 1 billion people, and is estimated to cause 9.4 million deaths each year, doubling the risk of cardiovascular diseases, including coronary heart disease, congestive heart failure, ischemic and hemorrhagic cerebrovascular disease, renal failure, and peripheral arterial disease. For this reason, it is

extremely important to make a timely diagnosis and start an adequate treatment according to the associated cardiovascular risk factors.

Hypertension, being a multifactorial pathology, which is classified from the etiological point of view into primary causes (obesity, hypercholesterolemia, smoking, etc.) and secondary causes (OSAHS, pheochromocytoma, primary hyperaldosteronism, renal artery stenosis, etc.), primary causes are the most common. Usually, the majority of the population responds adequately to first-line drug treatment (ACEI/AIIRA, diuretics, beta-blockers, calcium antagonists). However, there is a very small group <10% that is part of the "Refractory Arterial Hypertension" group 4-5. This term will be reserved for situations in which hypertension is not controlled with a regimen of five antihypertensive drugs; All of the aforementioned generate a negative impact on the health system related to the high costs of handling this pathology, for this reason, new non-invasive

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strategies have been created to control it.

Among the most innovative strategies is the RDN, which has been endorsed by multiple studies; Said procedure is based on the physiological premise of the interruption of the afferent and efferent renal nerves, which will result in a decrease in the renal sympathetic signal, thus reducing the release of renin and sodium retention, resulting in an increase in renal blood flow and therefore, decreasing BP 6-7.

Here we reported the case of an adult female patient with Refractory Arterial, which underwent RDN, obtaining an adequate clinical result.

Case report

A 42-year-old female patient with risk factors chronic hypertension, type II diabetes mellitus (DM), dyslipidemia, venous insufficiency, and obesity; She was under pharmacological management with five

oral antihypertensives from different groups (alpha-blockers, Central alpha-adrenoceptor agonists, no dihydropyridine calcium blockers, Non-cardioselective Beta Blockers). Despite this management, it was difficult to control their blood pressure levels, for which reason she had been admitted to the emergency department on multiple occasions in the health center in the context of an emergency-type hypertensive crisis, for this reason, studies were carried out in search of secondary causes. as refractory hypertension triggers, obtaining normal results. In view of the foregoing, ambulatory blood pressure monitoring (ABPM) was performed with evidence of a mean arterial pressure (MAP) during the day of 209/139 mmHG and at night of 183/121 mmHg, given previous findings and evidencing a significant impact on its quality of life, the performance of bilateral RDN (Figure 1) was considered as an adjuvant

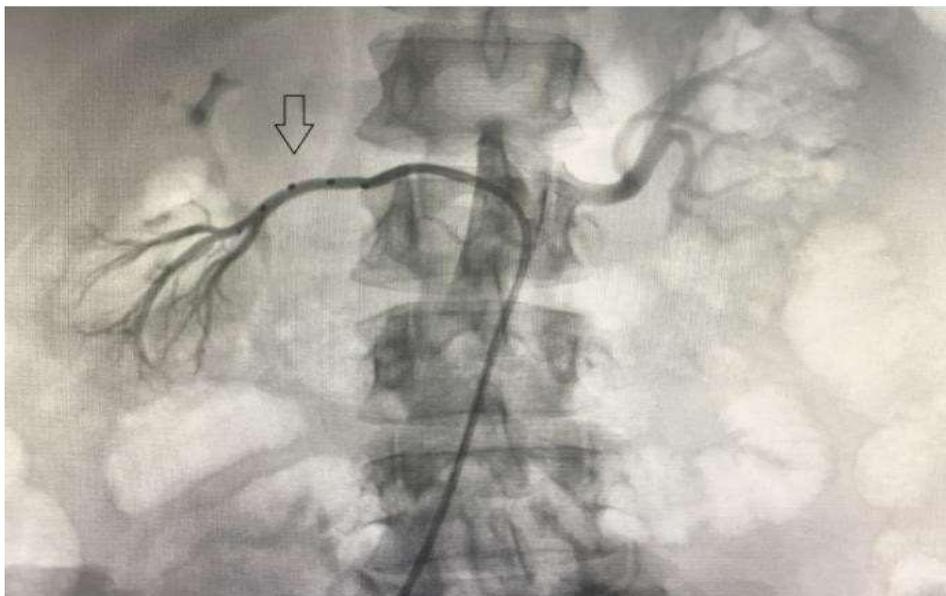


Fig 1: Right renal artery denervation (arrow). Simplicity spiral 6fr renal ablation catheter to the proximal and middle third of the left renal artery to perform 20 applications of radiofrequency ablation without complications

After the procedure, we found an asymptomatic patient with adequate control of blood pressure levels, making it possible to be discharged after 5 days with only three oral antihypertensives from different pharmacological groups. Outpatient follow-up with control appointments continues and significant decreases in both daytime and nighttime MAP have been evidenced.

References

1. Harrison, T. R. (2022). Diabetes Mellitus in Harrison's Principles of Internal Medicine. Loscalzo J, Fauci A, Kasper D, Hauser S, Longo D, Jameson J, editors.
2. [Polegato, B. F., & de Paiva, S. A. \(2018\). Hypertension and exercise: a search for mechanisms. *Arquivos Brasileiros de Cardiologia*, 111, 180-181.](#)
3. [Whelton, P. K., Carey, R. M., Aronow, W. S., Casey, D. E., Collins, K. J., Dennison Himmelfarb, C., ... & Wright, J. T. \(2018\). 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/A SPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Journal of the American College of Cardiology*, 71\(19\), e127-e248.](#)

4. [Whelton, P. K., Carey, R. M., Aronow, W. S., Casey, D. E., Collins, K. J., Dennison Himmelfarb, C., ... & Wright, J. T. \(2018\). 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/A SPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Journal of the American College of Cardiology*, 71\(19\), e127-e248.](#)
5. [Daugherty, S. L., Powers, J. D., Magid, D. J., Tavel, H. M., Masoudi, F. A., Margolis, K. L., ... & Ho, P. M. \(2012\). Incidence and prognosis of resistant hypertension in hypertensive patients. *Circulation*, 125\(13\), 1635-1642.](#)
6. [Acelajado, M. C., Hughes, Z. H., Oparil, S., & Calhoun, D. A. \(2019\). Treatment of resistant and refractory hypertension. *Circulation Research*, 124\(7\), 1061-1070.](#)
7. [Schlaich, M. P., Bart, B., Hering, D., Walton, A., Marusic, P., Mahfoud, F., ... & Esler, M. D. \(2013\). Feasibility of catheter-based renal nerve ablation and effects on sympathetic nerve activity and blood pressure in patients with end-stage renal disease. *International journal of cardiology*, 168\(3\), 2214-2220.](#)
8. [Sievert, H., Schofer, J., Ormiston, J., Hoppe, U. C., Meredith, I. T., Walters, D. L., ... & Cohen-Mazor, M. \(2015\). Renal denervation with a percutaneous bipolar radiofrequency balloon catheter in patients with resistant hypertension: 6-month results from the REDUCE-HTN clinical study. *EuroIntervention: journal of EuroPCR in collaboration with the Working Group on Interventional Cardiology of the European Society of Cardiology*, 10\(10\), 1213-1220.](#)