

## Background

Tight renal artery stenosis (RAS) may be related to atherosclerosis, fibromuscular dysplasia, and Takayasu arteritis. RAS can be a cause of renovascular hypertension and renal failure [1]. The treatment of these lesions is primarily medical but may sometimes require surgical or endovascular revascularization. Percutaneous transluminal renal angioplasty (PTRA) is now occupying an increasingly important place in the management of these lesions. The endovascular technique is well mastered but the results are poorly known. The purpose of this work was to evaluate the outcomes of the PTRA in our team.

## Patients & Methods

We report a retrospective study between 2013 and 2018. All the patients included in this study were treated by PTRA of a tight RAS ( $\geq 75\%$ ) for a renovascular hypertension or a rapidly progressive renal failure.

## Results

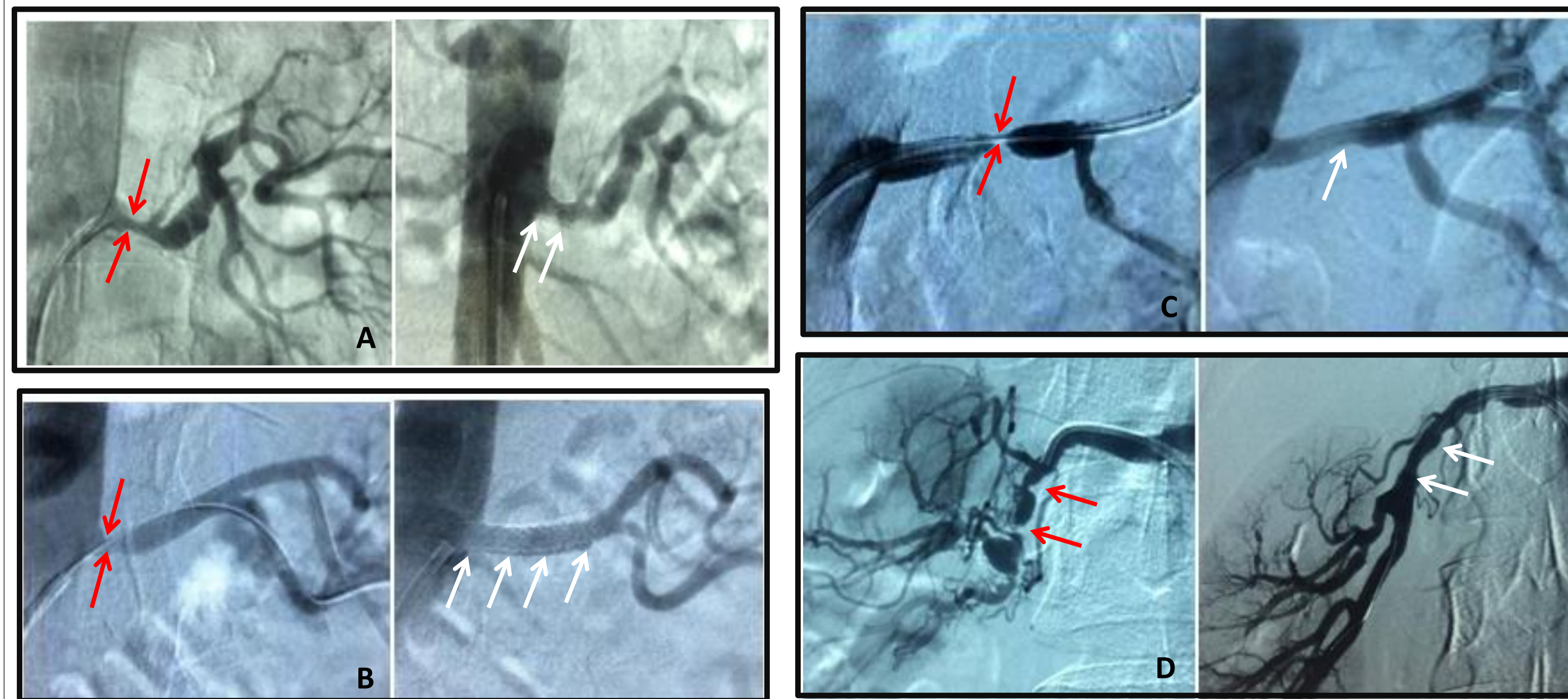
Our population consisted of 17 patients. The average age was 51,1years old [18-76 years old]. There were 8 men and 9 women. All patients were known hypertensive. 64,70% were diabetic, 23,52% dyslipidemic and 58,82% smoked. RAS was symptomatic of resistant hypertension in 16 patients and of a rapidly progressive renal failure in one patient. RAS was secondary to atherosclerosis in 9 cases, to fibromuscular dysplasia in 6 cases and to Takayasu arteritis in 2 cases. RAS was suspected by Doppler ultrasound and confirmed by CT angiography in all cases. The average stenosis rate was 85.9% [70%-95%]. All patients had arterial balloon dilatation. We dropped a stent in 9 patients. The technical success rate was 100%. Mortality was zero, even the morbidity. All patients experienced a decrease in blood pressure, requiring the discontinuation of antihypertensive treatment for 10 patients and the decrease in doses for 6 patients. We noted an improvement in renal function in the patient who had renal failure. The permeability rate was 100% at 1 year, 94,11% at 2 years and 94,11% at 3 years. One patient presented with stent thrombosis. The restenosis rate was zero in our series.

## Discussion

Our study showed that the outcomes of PTRA were satisfying in the short and long term. The patency was 100%, 94.11% and 94.11% at respectively 1, 2 and 3 years for any etiologies. Although our study counts 17 patients, it remains small compared to the 1080 patients in the CORAL study [2]. In our study, 53% of RAS was atherosclerotic which is the most common etiology for an aging population [3] [4]. According to the latest ESC 2017 guidelines [5], revascularization of the RAS is not routinely indicated for degenerative lesions (recommendation III A), endovascular therapy is indicated as first-line therapy and renal revascularization surgery is indicated for complex anatomy, failure of endovascular therapy or associated aortic surgery (recommendation IIa). Moreover, also for ESC 2017 [5], angioplasty stenting should be considered for fibro-muscular dysplasia (recommendation level IIa). Despite our 53% RAS atherosclerosis, outcomes were satisfying (with an average follow-up of 12 months) In our study, the technical success rate was 100%. The results are consistent with the literature, between 83% and 98% [6] [7]. The patency rate in our study was 100% at 1 year, 94.11% at 2 years and 94.11% at 3 years. Weibull reported in 1993 a primary patency estimated at 75% and a secondary patency at 90% [6]. Sivamurthy reported better results in 2003; 82% and 100%. Our results are consistent with the literature despite our low workforce 17 patients [7].

Some studies have shown that PTRA is not superior to medical treatment alone, but this result has only been confirmed for atherosclerotic stenosis [8]. Yuefeng Zhu et al [8], in a meta-analysis published in 2016, reviewed the results of 7 large studies of 1916 patients. In this meta-analysis comparing angioplasty to medical treatment, authors has found a difference between the 2 groups in terms of improvement of blood pressure in favor of endovascular treatment ( $p = 0.15$ ) but that there was no significant difference in terms of occurrence of cardiovascular event ( $P < 0.001$ ). Tetsutaro Matayoshi and al [9], in a series of 50 patients published in 2018, also found satisfying results of renal artery angioplasty. The decrease in blood pressure was significant compared to the blood pressure before revascularization ( $p < 0.05$ ) but in this study there was no gain on renal function. This series included 42 cases of atherosclerosis, 6 cases of fibromuscular dysplasia and 2 cases of Takayasu disease. This study joins ours in terms of improvement of blood pressure figures and confirms the good results of renal angioplasty for any cause combined.

Studies that have studied renal angioplasty in patients with fibromuscular dysplasia have found encouraging results. Mousa and al [10], about a series of 35 patients found a patency of 100% after 9 years of follow-up with a significant decrease in blood pressure and a marked improvement in renal function.



Results after percutaneous transluminal renal angioplasty (PTRA)  
 A- Atherosclerotic ostial stenosis  
 B- Atherosclerotic post-ostial stenosis  
 C- Truncular stenosis (Takayasu arteritis)  
 D- Moniliform stenosis (Fibromuscular dysplasia)



Angiographic control: Stent thrombosis

## Conclusion

PTRA is currently indicated as first-line therapy for renal revascularization. The progress of various endovascular procedures in recent years has made this technique simple and minimally invasive. Despite several criticisms, this treatment is often associated with satisfying results in the short and long term.

## REFERENCES

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