The current indication for renal stenting should be salvaging renal function rather than treating hypertension. The aim of our study was to determine the effectiveness of renal stenting in improving renal function. We also assessed the usefulness of preoperative resistance index (RI) to select patients who will benefit most from this procedure.

MATERIALS AND METHODS
From January 2008 to January 2013, 62 patients (48 males), mean age 69 years, underwent renal artery stenting for obstructive atherosclerotic lesions with a total of 65 stents (3 bilateral). All patients had a mild to moderate chronic renal insufficiency with serum creatinine (sCr) values ranging from 1.5 mg/dL (132 mmol/L) to 2.5 mg/dL (220 mmol/L), while blood urea nitrogen (BUN) was between 80 and 107 mg/dL. All had hypertension (mean BP 150/95 mm Hg) despite pharmacological therapy with >2 drugs. Type 2 diabetes was present in 15 cases and 18 had a history of myocardial infarction (MI). Screening test was performed by color duplex scanning (CDS). AngioCT or MRI angiography was performed to confirm the ultrasound findings. The RI was measured in the segmental arteries of both kidneys. Individuals with unilateral or bilateral hydrenephrosis, renal cysts, tumors, or stones were excluded from the study. Patients were stratified on the basis of their intrarenal RI < 0.70. Indication for stenting was renal artery stenosis >70%, as detected both on CDS and on angio-computerized tomography (CT)/magnetic resonance imaging (MRI). The mean RI ranged from 0.76 to 0.89 in 14 patients and from 0.58 to 0.75 in the remaining 49 cases. Clopidogrel of 300 mg was administered on the day before treatment, followed in the postoperative period by 7.5 mg/d of clopidogrel and 100 mg/d of aspirin for the next 12 months. Subsequently, a single antplatelet agent was prescribed.

RESULTS:
All renal artery stenting procedures were technically successful. Stenting-related mortality was nil. No procedure-related events. In 1 case, a femoral pseudoaneurysm was treated surgically. During follow-up (mean 29 months), 4 patients died for MI and 1 for unknown reasons with an 8% mortality incidence rate. Ten patients with an RAS >80% developed a critical intransist stenosis and needed a further PTA. Cumulative primary patency rate was 83.8%, and the secondary patency rate was 93.5% at 5 years. Concerning hypertension, 24 (38.7%) patients renal stenting led to a persistent improvement in hypertension. In 31 (50%) patients, RAS was followed by a dramatic BP reduction in the first 3 to 6 months; nevertheless, these results were limited in time so that BP returned to the preoperative values and again drugs were restarted despite a patent renal artery stent. Renal function improved progressively over time in 43 (69.4%) patients, including the 3 with bilateral stenting. Renal function remained unchanged in 12 (19.3%) patients, and in the remaining 7 (11.3%) patients a worsening occurred so that 3 needed dialysis. Using the Friedman ANOVA test, the median values of sCr and BUN measured in the postoperative phase were higher than those measured postoperatively and the latter was higher than those recorded 24 months after renal stenting. These data are statistically significant for both parameters as shown in Fig. 1. It must be underlined that in this study, of 14 patients with an RI >0.75 (71.4%), 10 experienced no improvement or even a decline in renal function, despite a successful procedure. All cases with an RI >0.80 preoperatively tended to have an overall deterioration in renal function 24 months after stenting. Conversely, all patients with preoperative RI values <0.75 showed an improvement in renal function. These data are statistically significant as showed by the logarithmic relation between pre- and postoperative sCr and BUN levels and the preoperative RI (Fig. 2A and B).

DISCUSSION AND CONCLUSIONS:
Our experience confirms that renal artery stenting can be performed with negligible periprocedural complication rate, and >93% patency can be obtained. Permanent improvement in hypertension was achieved in a minority of patients undergoing renal endoluminal revascularization while the benefit is only transient in most of cases. Our results allow the following conclusions: stenting has produced an overall improvement in renal function in most of patients. Serum creatinine and BUN are reliable indicators of this improvement and they are essentially equivalent from the statistical point of view. In our opinion, in those patients with severe RAS, sCr and BUN levels must not be considered as indications for stenting. An RI as a measure of the underlying chronic parenchymal disease is still questionable. Several investigators30,31 have indicated a wide interval of threshold values for renal impairment and/or of poor renal outcome at >0.70; this contributes to questions about the clinical utility of this measurement. Rocha-Singh et al32 demonstrated an improvement or stabilization in renal function after renal artery stenting irrespective of renal RI. Conversely, as also documented by Rademaker et al,33 we observed a significant correlation between postoperative high sCr and BUN levels and preoperative pathological RI. In our series, the baseline RI threshold value of poor renal outcome range was >0.75. A preoperative RI up to 0.75 could be used as an indicator to predict which candidates will have a consistent improvement in renal function within 24 months after stenting. If we assume that the current indication for renal stenting is the prevention or improvement of chronic renal failure rather than the treatment of systemic arterial hypertension, the use of IR <0.75 as an indicator of potential improvement of renal function should limit even further the indication for this procedure. This study is limited by a small cohort size and a retrospective analysis. Randomized controlled trials will be needed to determine the impact of renal stenting to prevent or arrest the progression to hemodialysis.