REESTENOSE INTRA-STENT DA ARTÉRIA RENAL

RENATO SANCHEZ ANTONIO
RICARDO DE SOUZA ALVES FERREIRA

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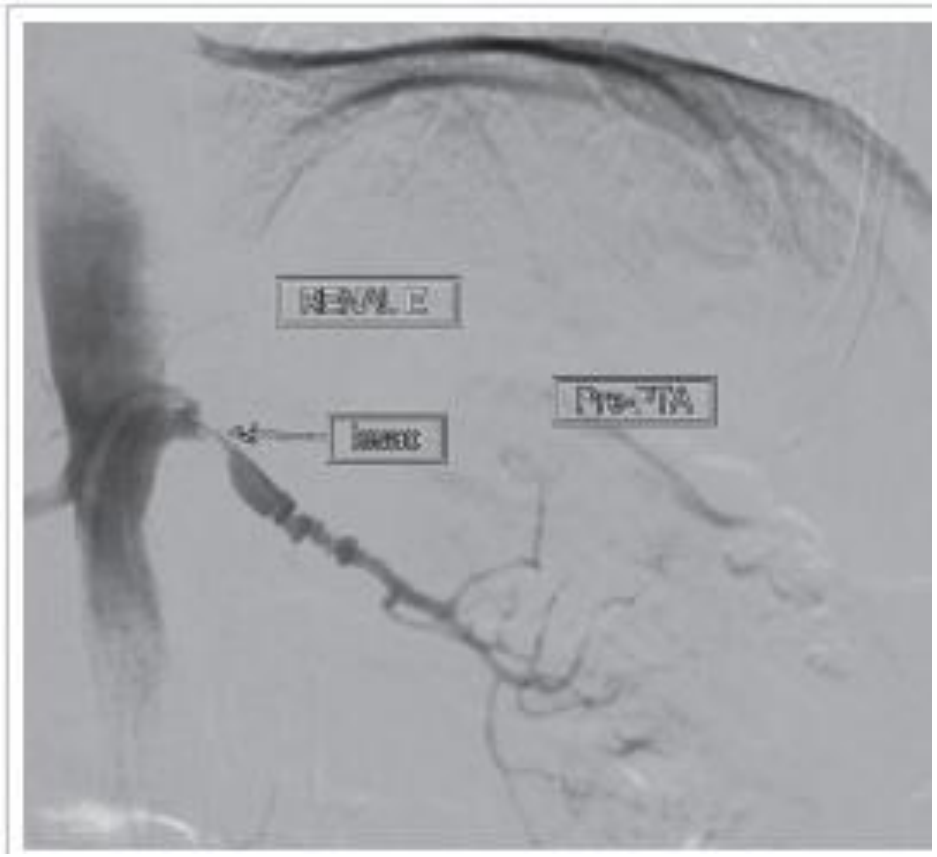
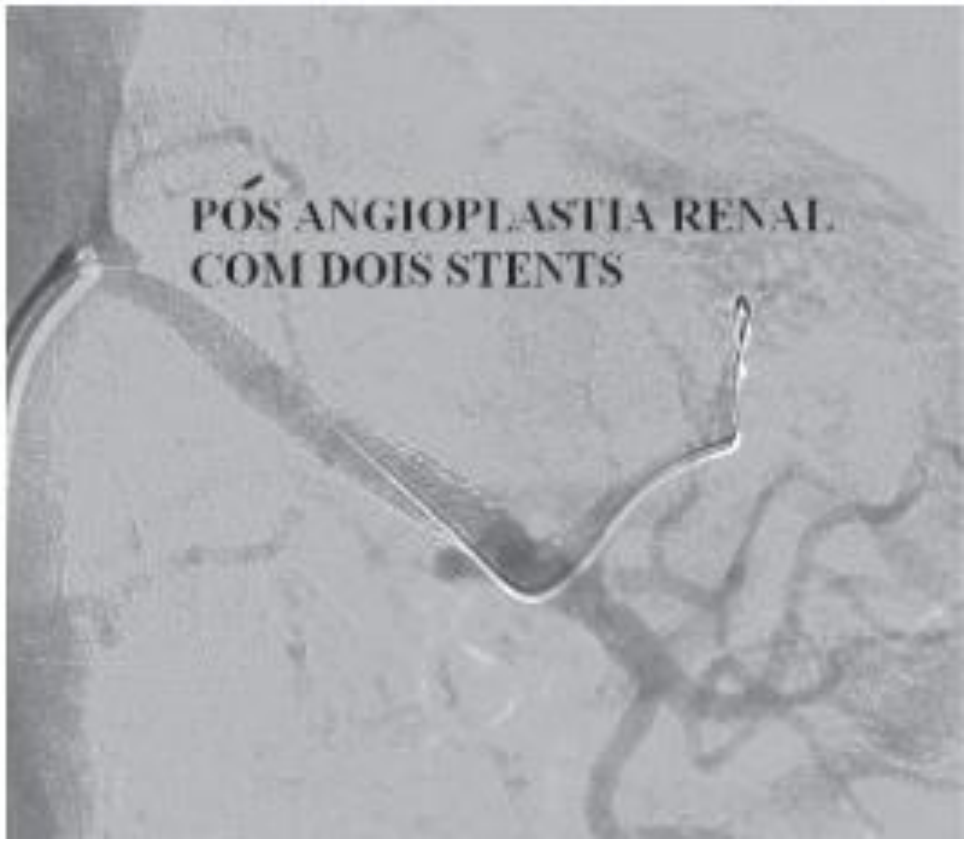
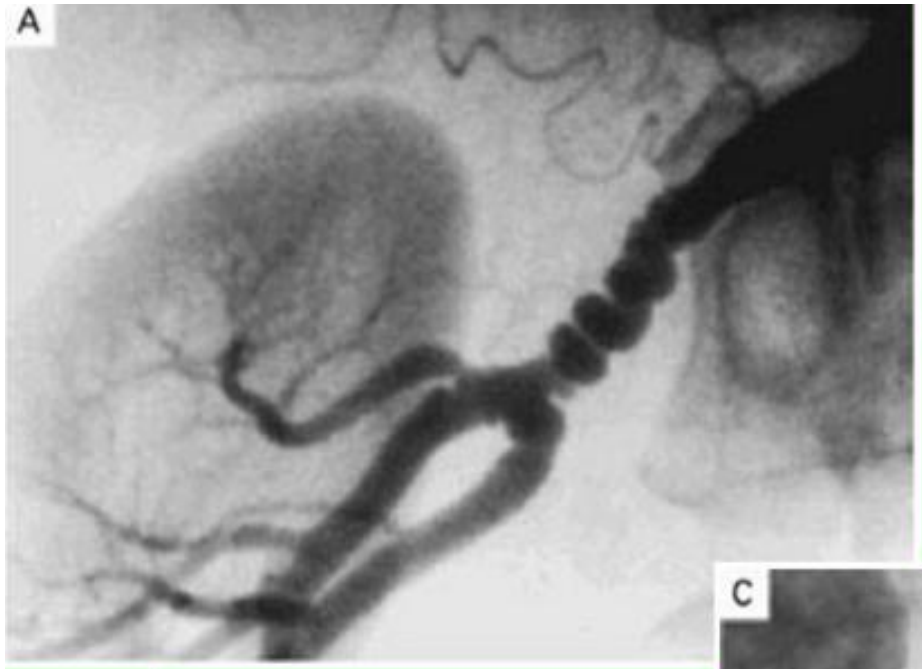
ESTENOSE DE ARTÉRIA RENAL DO DIAGNÓSTICO AO TRATAMENTO





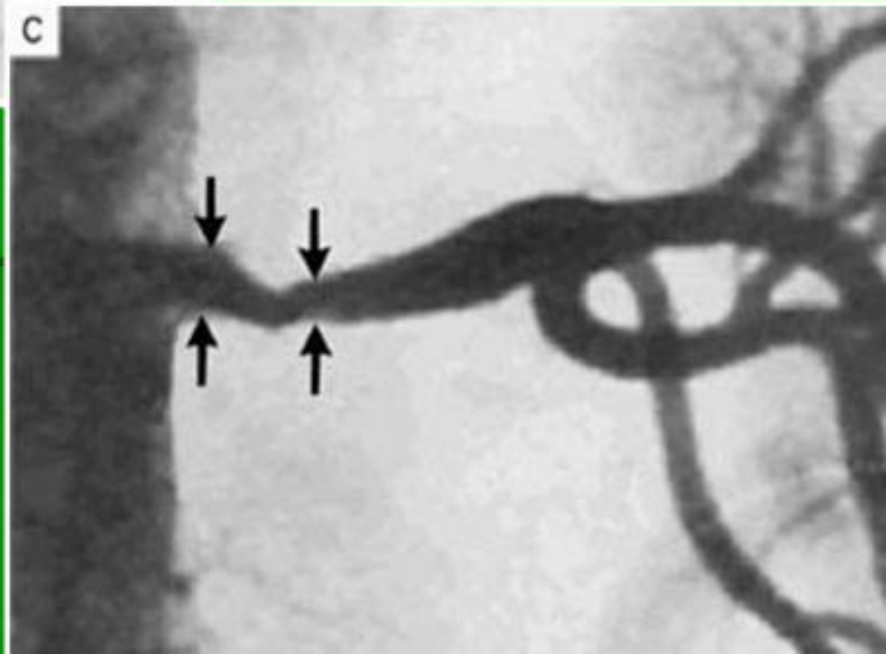
Indicação de tratamento percutâneo

- Paciente com lesão grave e rim maior que 8 cm.
- Pressão diastólica > 100 mmHg em uso de 3 medicações ou intolerância a medicação
- Piora progressiva da função renal
- Episódios de flash edema
- Angina instável.



Displasia fibromuscular:
10% das causas de
estenose da artéria renal.

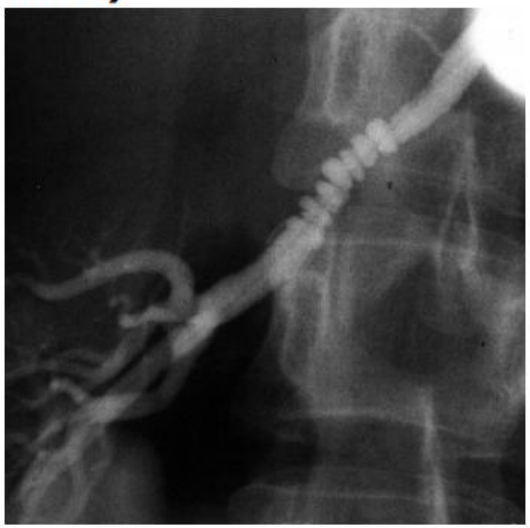
Aterosclerose



Displasia fibromuscular

- Predominância do sexo feminino
- Idade 15-50 anos
- Terço médio e distal da artéria
- Aparência frisada (colar de contas)

Balão



Can J Cardiol Vol 25 No 8 August 2009

CLINICAL STUDIES

Experience of stenting for atherosclerotic renal artery stenosis in a cardiac catheterization laboratory: Technical considerations and complications

Percy P Jokhi MB BChir PhD, Krishnan Ramanathan MB ChB FRCPC, Simon Walsh MD, Anthony Y Fung MB BS FRCPC FACC, Jacqueline Saw MD, Rebecca S Fox MSc, Nadia Zalunardo MD SM, Christopher E Buller MD FACC

TIPOS STENT

Stenting: Bare metal stents were used exclusively, including Express Biliary (Boston Scientific; 14.3%), Genesis (Cordis Corporation; 2.9%), Herculink (Guidant, USA; 20%), Racer (Medtronic, USA; 4.3%), Ross (evYsio Medical Devices, Canada [investigational stent used in the unpublished ROSSE study]; 32.9%), Tetra (Guidant Corporation, USA; 1.4%), Ultra (Abbott Laboratories, USA; 7.1%) or Liberte (Boston Scientific Corporation; 17.1%). Coronary stents were used when the estimated reference vessel diameter was less than 5 mm. Because the majority of lesions involved the ostium, operators endeavoured to deploy the stent with the proximal 1 mm to 2 mm protruding into the aorta. High-pressure postdilation was performed at the operator's discretion, with the balloon retracted a few millimetres further into the aorta, or with a shorter, noncompliant balloon to optimize stent expansion and minimize the risk of distal stent edge dissection. Procedural success was defined as successful stent delivery with residual stenosis of less than 20% and no immediate procedural complications.

JFR 2007, CNIT La Défense, Paris

Angioplastie des resténoses endostent artérielles rénales athéromateuses: 51 patients

Vo Hoang Viet, Grégory Favrolt, Pascal Chabrot, Lucie Cassagnes, Eric Dumousset, Agaïcha Alfidja, Ewa Lipiecka, Anne Ravel Boyer Louis.

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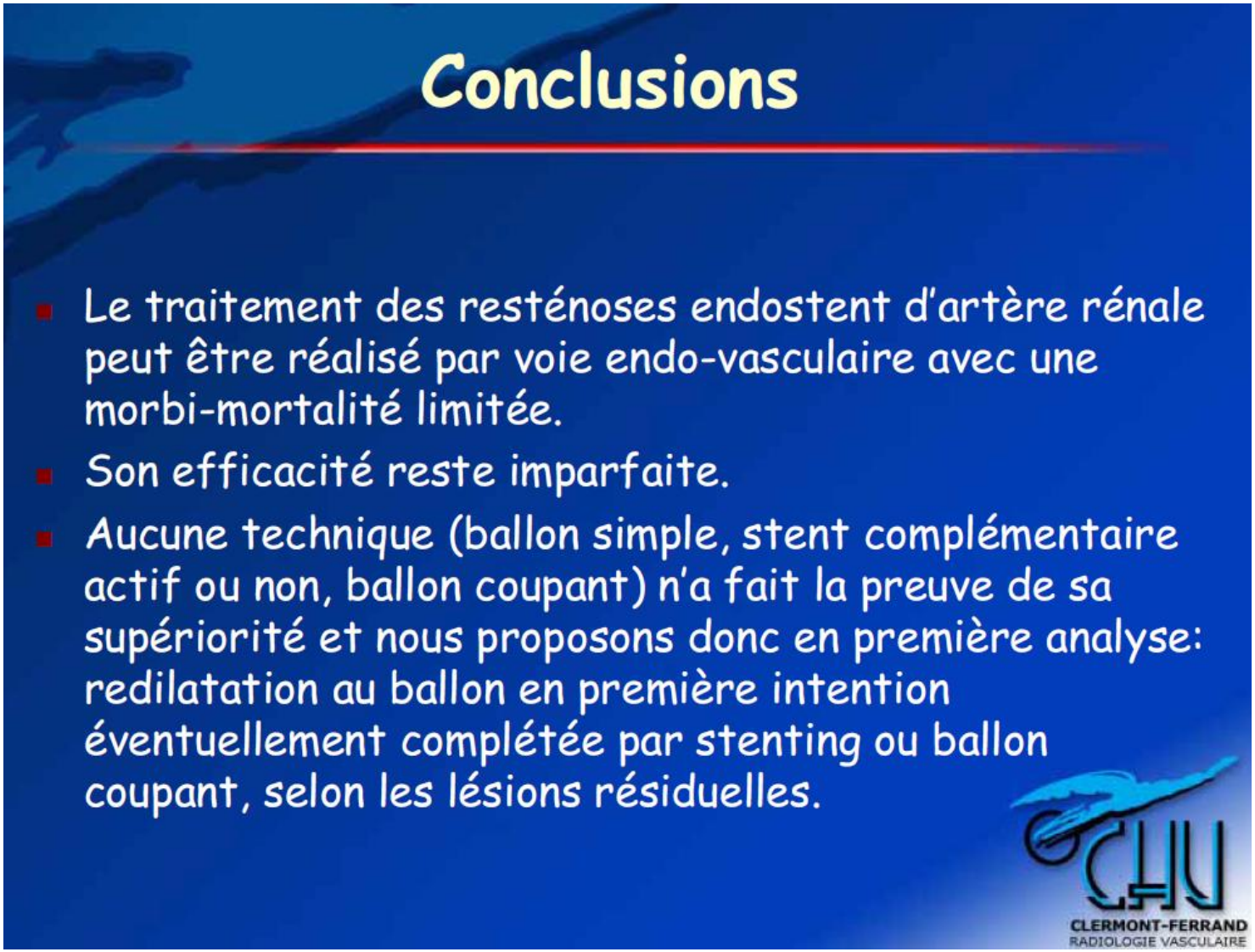
REESTENOSE INTRA-STENT DE ARTÉRIA RENAL



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Treatment of renal artery in-stent restenosis with sirolimus-eluting stents

Thomas J Kiernan, Bryan P Yan, Jonathan D Eisenberg, Nicholas J Ruggiero, Vishal Gupta, Douglas Drachman, Robert M Schainfeld, Michael R Jaff, Kenneth Rosenfield and Joseph Garasic

Abstract

The objective of this study was to analyze the use of sirolimus-eluting stent (SES) placement for the treatment of renal artery in-stent restenosis (RA-ISR). The optimal treatment of RA-ISR has not been fully elucidated to date. We retrospectively analyzed consecutive patients from our institution who underwent treatment of RA-ISR with a SES from May 2004 to June 2006. Using duplex ultrasound, RA-ISR (> 60% diameter) was determined by peak systolic velocity (PSV) > 300 cm/s and renal aortic ratio (RAR) > 4.0. Renal function (creatinine) and blood pressure were measured at baseline and follow-up. SESs were implanted in 16 patients (22 renal arteries) during the study period. The study cohort was predominantly female (75%) with a mean age of 68 ± 12 years. RA-ISR was treated with SESs with a mean diameter of 3.5 mm and mean length of 17.9 ± 3.8 mm. The mean post-dilation balloon diameter was 4.8 ± 0.6. The baseline renal artery PSV was 445 ± 131 cm/s with a mean RAR of 5.0 ± 1.6. Follow-up information was available in 21 renal arteries. During a median follow-up of 12 months (range: 9–15 months), 15 renal arteries (71.4%) developed recurrence of ISR by ultrasonographic criteria. Univariate analysis revealed that female sex was an independent predictor of recurrence of ISR after SES implantation ($p < 0.05$). In conclusion, placement of a SES for the treatment of ISR in renal arteries is associated with high initial technical success but significant restenosis on duplex ultrasonography at follow-up.

Keywords

hypertension; in-stent restenosis; renal artery stenosis; sirolimus

REESTENOSE INTRA-STENT DE ARTÉRIA RENAL

- A total of 90% of lesions were aorto ostial in location and the remaining 10% were in the proximal third of the renal artery.
- All renal arteries had previously under gone stenting with bare-metal stents with a mean diameter of 5.2 ± 0.8 mm and mean length of 15.9 ± 3.1 mm.
- RA-ISR was treated with sirolimus-eluting balloon expandable stents with a mean diameter of 3.5 mm and mean length of 17.9 ± 3.8 mm. The mean post-dilation balloon diameter was 4.8 ± 0.6 mm.
- The ratio of bare-metal stent post-deployment diameter to SES post-deployment stent diameter was 1:0.92, reflecting an almost final 1:1 ratio.

SES (Cypher, J&J)

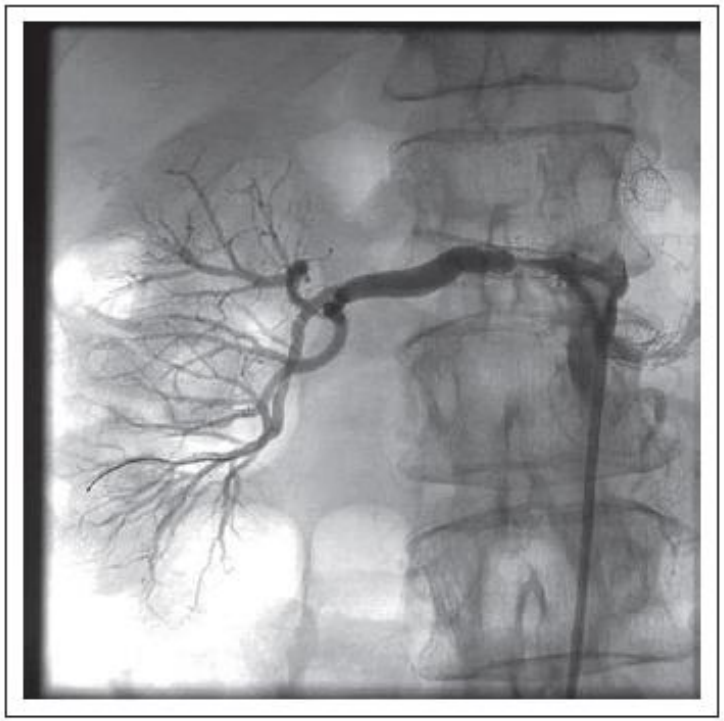

Figure 1. Angiographic in-stent restenosis of a bare-metal stent within the right renal artery.

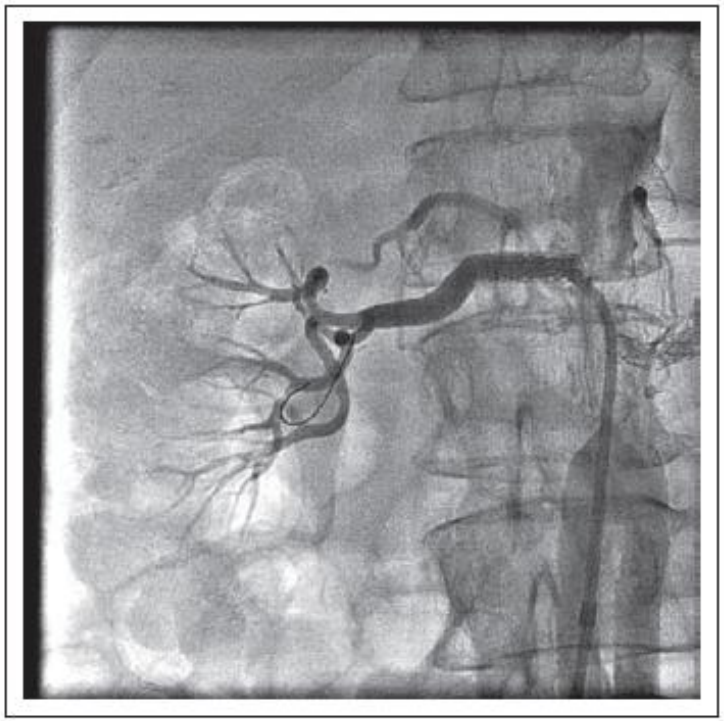

Figure 2. Angiographic result after SES implantation for in-stent restenosis of the right renal artery.

REESTENOSE INTRA-STENT DE ARTÉRIA RENAL

- Our study cohort is interesting in that it represents a series of predominantly female (75%) patients with atherosclerotic RA-ISR. Optimal treatment of RA-ISR is not established, with therapeutic options including balloon angioplasty, cutting balloon angioplasty, stent-in-stent angioplasty, covered stent placement, and intra-vascular radiation therapy. Each of these modalities has only been studied in small single-center series or case reports and not in randomized trials

Ten-year experience with renal artery in-stent stenosis

Patrick A. Stone, MD,[a] John E. Campbell, MD,[a] Ali F. AbuRahma, MD,[a] Malik Hamdan,[b] Mike Broce, BA,[b] Aravinda Nanjundappa, MD,[a] and Mark C. Bates, MD,[a] *Charleston, WVa*

Background: Atherosclerotic renal artery stenosis (RAS) is the most common cause of secondary hypertension. Renal stenting has become the treatment of choice for RAS in most centers. Primary patency of RAS is well defined, but limited data are available on outcomes of secondary interventions for treatment of in-stent restenosis.

Methods: This was a retrospective analysis of a 10-year experience with renal artery stenting in patients presenting with recurrent symptomatic stenosis. End points included freedom from tertiary procedures, change in baseline renal function by ≥20% measured by estimated glomerular filtration rate (eGFR), patency confirmed by duplex imaging, long-term hypertension response, freedom from hemodialysis, and survival.

Results: We reviewed 948 patients with 1150 treated renal arteries. Of these, 107 patients (122 renal stents) returned with symptomatic in-stent restenosis and required reintervention (target vessel revascularization [TVR] rate, 10.6%): 97% had recurrent or worsening hypertension, and 67% had worsening renal function. There were 69 women (64%) and 38 men (35%) with an average age of 68.9 years. Mean follow-up was 35.5 months (range, 1.0-104.7 months) for patency and 37.7 months (range, 0.03-100.9 months) for renal function (creatinine). Secondary interventions included 27 percutaneous transluminal angioplasties (PTAs), 10 PTAs with cutting balloon, 77 repeat renal artery stenting, and 8 placements of drug-eluting stents (DES). Twenty-five of the 122 arteries (20%) required tertiary interventions in 23 patients, a significantly higher TVR rate vs de novo interventions (11%; $P = .003$). Freedom from tertiary interventions at 60 months was similar among treatment groups undergoing PTA (66%), cutting balloon (100%), stent (80%), and DES (75%; $P = .348$). Seventeen (16%) had an increase of >20%, 50 (47%) had a decrease of >20%, and 30 (28%) had no change in renal function. Ultimately 25 (23%) remained or progressed to renal failure (eGFR < 30%), and 8 required hemodialysis. The survival rate was 73% at 5 years. Mean follow-up for long-term hypertension response was 3.2 years, with 56% improved, 28% with no improvement or deterioration, 16% without long-term data available, and no patients cured.

Conclusions: Secondary interventions for renal in-stent restenosis had higher TVR vs de novo renal stents in this large series (21% vs 11%; $P = .003$). Definitive recommendations on the best secondary treatment strategy cannot be made because a medical treatment control group was not available for comparison. (J Vasc Surg 2011;53:1026-31.)

REESTENOSE INTRA-STENT DE ARTÉRIA RENAL

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- **107 patients (122 renal stents) returned with symptomatic in-stent restenosis and required reintervention target vessel revascularization [TVR]**
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- **Twenty-five of the 122 arteries (20%) required tertiary interventions in 23 patients, a significantly higher TVR rate vs de novo interventions (11%; *P .003).***
- ***Freedom from tertiary interventions at 60* months was similar among treatment groups undergoing PTA (66%), cutting balloon (100%), stent (80%), and DES (75%; *P .348).***
- **Seventeen (16%) had an increase of >20%, 50 (47%) had a decrease of >20%, and 30 (28%) had no change in renal function.**
- ***Conclusions: Secondary interventions for renal in-stent restenosis had higher TVR***
- ***Definitive recommendations on the best secondary treatment strategy cannot be made* because a medical treatment control group was not available for comparison.**

Quality Improvement Guidelines for Angiography, Angioplasty, and Stent Placement for the Diagnosis and Treatment of Renal Artery Stenosis in Adults

Louis G. Martin, MD, John H. Rundback, MD, Michael J. Wallace, MD, John F. Cardella, MD, John F. Angle, MD, Sanjoy Kundu, MD, Donald L. Miller, MD, and Joan C. Wojak, MD

J Vasc Interv Radiol 2010; 21:421–430

Abbreviations: FMD = fibromuscular dysplasia, RAS = renal artery stenosis

REESTENOSE INTRA-STENT DE ARTÉRIA RENAL

Indications for Angioplasty or Stent Placement: Threshold of 95%

Hemodynamically significant RAS is defined as the following:

1. Greater than 50% diameter stenosis or greater than 75% reduction in cross sectional area; and
2. A systolic pressure gradient greater than 10% of systolic pressure or 10, 15, or 20 mm Hg.

Relative Contraindications for Renal Artery Stent Deployment: Threshold of 5%

1. A renal bifurcation lesion in which more than 50% of a kidney will be excluded by a stent;
2. The presence of sepsis; and
3. Renal artery diameter measuring 4 mm or less, unless a drug-eluting stent is used (39).

Preliminary Study of the Use of Drug-eluting Stents in Atherosclerotic Renal Artery Stenoses 4 mm in Diameter or Smaller

Sanjay Misra, MD, Mallik R. Thatipelli, MBBS, Patrick W. Howe, RN, Christopher Hunt, MD, Verghese Mathew, MD, Gregory W. Barsness, MD, Axel Pflueger, MD, PhD, Stephen C. Textor, MD, Haraldur Bjarnason, MD, and Michael A. McKusick, MD

PURPOSE: To describe restenosis and clinical outcomes with drug-eluting stents (DESs) and compare them to those of bare metal stents (BMSs) in the treatment of symptomatic atherosclerotic renal artery stenosis (RAS) in the same patients.

METHODS AND MATERIALS: A retrospective study was performed of all patients with RAS treated with a DES (Taxus Express 2 or Cypher). DESs were used for RASs with luminal vessel diameters of 4 mm or smaller and BMSs were used for those larger than 4 mm.

RESULTS: Sixteen patients (eight women; mean age, 72 years ± 8) underwent treatment of 27 RASs for worsening renal function ($n = 10$) and uncontrolled hypertension ($n = 6$). Eighteen RASs were treated with 23 DESs (Cypher, $n = 12$; Taxus, $n = 11$) and nine were treated with BMSs. The average follow-up was 22 months ± 10. After the procedure, the mean systolic blood pressure decreased significantly ($P < .05$), with no change in the mean diastolic pressure, serum creatinine, or number of antihypertensive medications. By Kaplan-Meier estimates, the 1- and 2-year patency rates for DESs were 78% and 68%, respectively; and for BMSs, the respective rates were 58% and 47% (P = NS). The average diameters of RASs were 3.4 mm ± 0.6 in the DES group and 5.3 mm ± 0.6 in the BMS group ($P < .05$). There were two technical failures (7.7%) in the DES group. There was one minor complication and a non–flow-limiting dissection.

CONCLUSIONS: DESs were used to treat RASs with good technical results and low restenosis rates compared with BMSs despite the smaller artery diameters in the DES group.

J Vasc Interv Radiol 2008; 19:833–839

Abbreviations: BMS = bare metal stent, RAS = renal artery stenosis, RI = resistive index

- **DES X BMS**
- (Taxus Express 2 or Cypher)
- DESs were used for RASs with luminal vessel diameters of 4 mm or smaller and BMSs were used for those larger than 4 mm
- **Sixteen patients/27 RASs**
- **Eighteen RASs were treated with 23 DESs (Cypher, *n*=12; Taxus, *n=11) and nine were treated with BMSs.***
- **By Kaplan-Meier estimates, the 1- and 2-year patency rates for DESs were 78% and 68%, respectively; and for BMSs, the respective rates were 58% and 47% (*P NS).***
- ***The average* diameters of RASs were 3.4 mm +-0.6 in the DES group and 5.3 mm +-0.6 in the BMS group (*P < .05).***
- **CONCLUSIONS: DESs were used to treat RASs with good technical results and low restenosis rates compared with BMSs despite the smaller artery diameters in the DES group.**

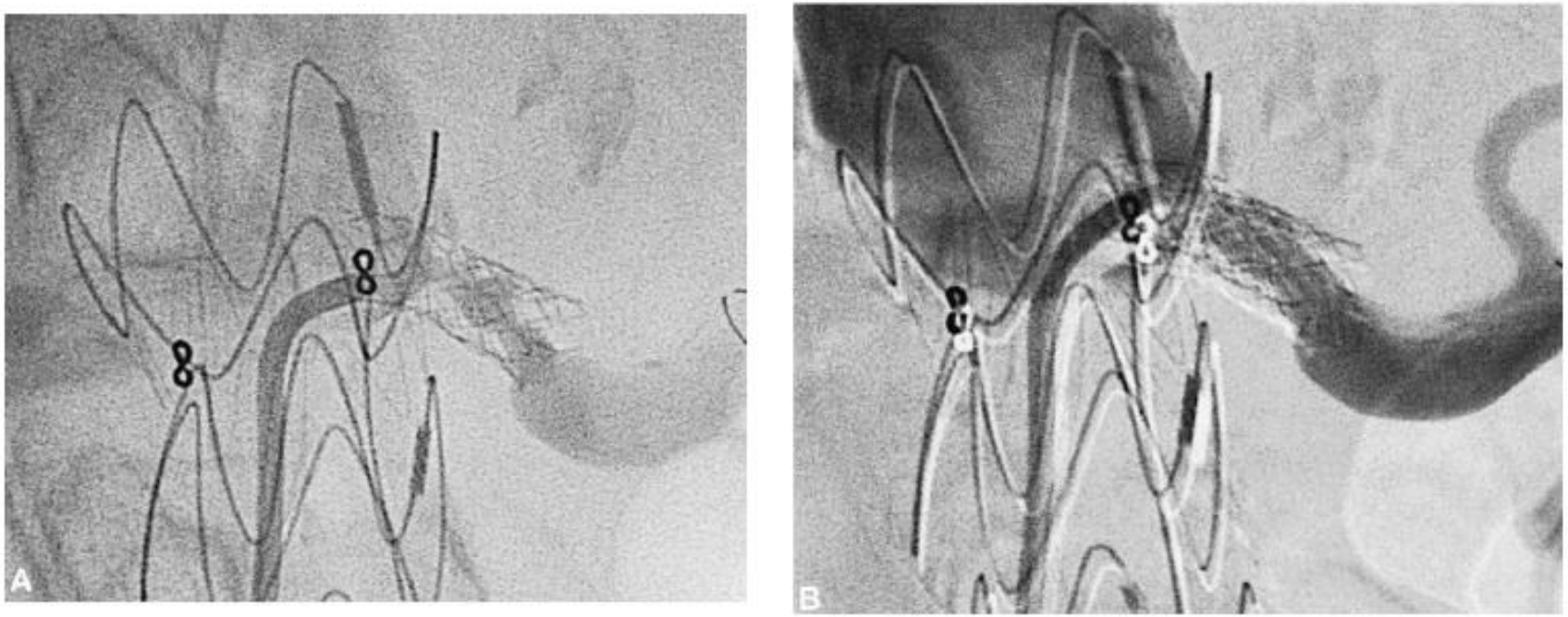
Sirolimus-eluting stent placement for refractory renal artery in-stent restenosis: sustained patency and clinical benefit at 24 months

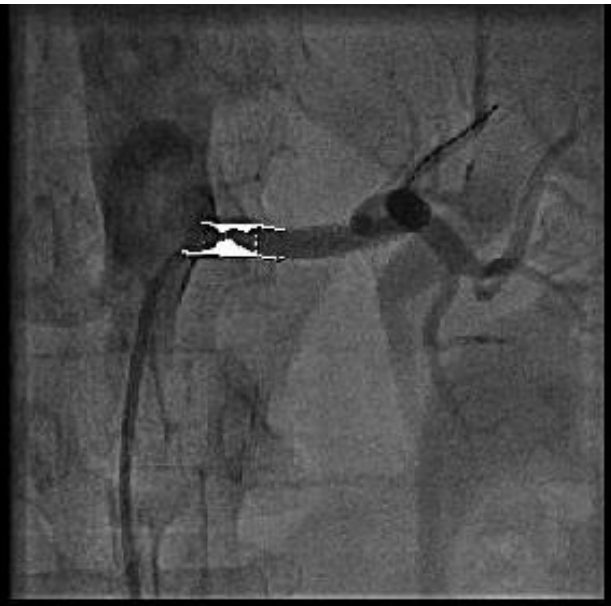
Robert A Lookstein Division of Interventional Radiology, Mount Sinai School of Medicine, **Adam D Talenfeld** Division of Interventional Radiology, Mount Sinai School of Medicine, **Roman Raju** Division of Interventional Radiology, Mount Sinai School of Medicine, **David A Vorchheimer** Division of Cardiology, Mount Sinai School of Medicine, **Jeffrey W Olin** Division of Cardiology, Mount Sinai School of Medicine and **Michael L Marin** Division of Vascular Surgery, Mount Sinai School of Medicine

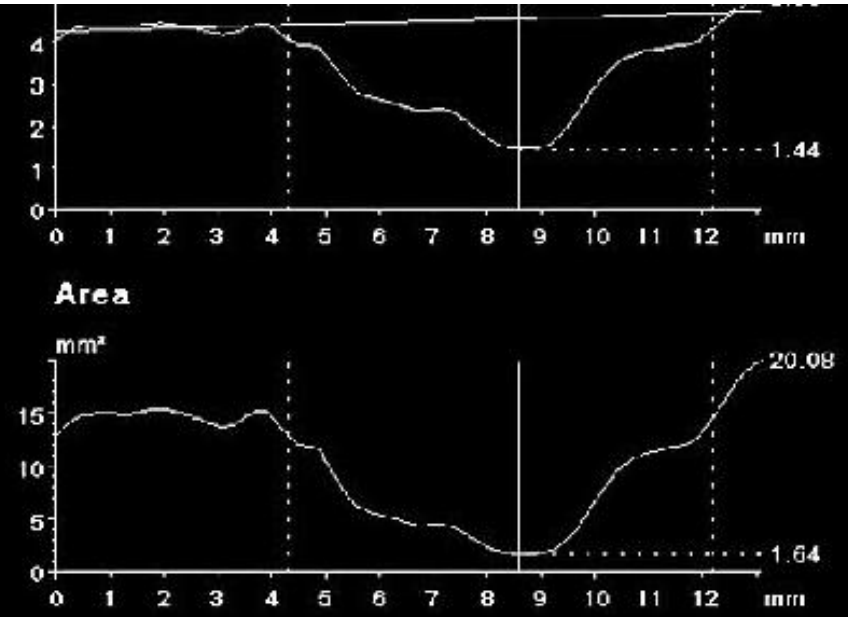
Abstract: Renal artery stenosis may cause or exacerbate hypertension and renal failure. Percutaneous transluminal renal artery stent placement, increasingly the first-line therapy for ostial atherosclerotic renal artery stenosis, can be complicated by in-stent restenosis weeks to months after the procedure. There is currently no consensus for the treatment of in-stent restenosis. Sirolimus-eluting stents have been shown to be effective to treat in-stent restenosis in the coronary circulation. We report a case of sustained 24-month patency after repair of recurrent renal artery in-stent restenosis with use of a sirolimus-eluting stent.

Keywords: drug-eluting stent, in-stent stenosis, renal artery stent, treatment

Figure 1 (A) The initial selective angiogram confirms the diagnosis of recurrent left renal artery ISR. (B) The lesion was successfully treated with a 3.5 × 23 mm sirolimus-eluting stent (Cypher; Cordis Endovascular), which was post-dilated with a 4.0 × 20 mm Aviator balloon (Cordis Endovascular).







Patient	DINAH MARIA DE ANDRADE
ID	6408
Birth date	05/01/1949
Physician	Dr.Renato Sanchez Anton...
Hospital	HCI-Sta C.S.S.Paraiso
Exam date	02/05/2016

Segment	
Stenosis Diameter	1.44 mm
Minimum Diameter	1.44 mm
Maximum Diameter	5.06 mm
% Stenosis Diameter	68 %
Stenosis Length	7.84 mm
Expected Diameter	4.55 mm

Compliance chart

Pressure (atm)	Balloon diameter (mm)										
	2.0	2.25	2.5	2.75	3.0	3.25	3.5	3.75	4.0	4.5	5.0
6	1.93	2.16	2.41	2.65	2.89	3.12	3.36	3.57	3.85	4.38	4.86
8	1.95	2.18	2.43	2.68	2.92	3.15	3.40	3.61	3.89	4.41	4.90
10	1.96	2.21	2.45	2.70	2.94	3.19	3.43	3.66	3.92	4.44	4.93
12	1.98	2.23	2.48	2.73	2.97	3.22	3.47	3.70	3.96	4.47	4.97
14	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.50	5.00
15	2.01	2.26	2.51	2.76	3.01	3.27	3.52	3.77	4.02	4.52	5.02
16	2.02	2.27	2.52	2.77	3.03	3.28	3.54	3.80	4.04	4.53	5.04
17	2.03	2.28	2.54	2.79	3.04	3.30	3.55	3.82	4.06	4.55	5.05
18	2.04	2.30	2.55	2.80	3.06	3.32	3.57	3.84	4.08	4.56	5.07
19	2.05	2.31	2.56	2.81	3.07	3.33	3.59	3.87	4.10	4.58	5.09
20	2.05	2.32	2.57	2.83	3.09	3.35	3.61	3.89	4.12	4.60	5.11
21	2.06	2.33	2.58	2.84	3.10	3.37	3.62	3.92	4.14	4.61	5.12
22	2.07	2.34	2.60	2.85	3.11	3.38	3.64	3.94	4.16	4.63	5.14

Nominal Pressure

Rated Burst Pressure

1 atm = 1.013 bar