

Techniques and Strategies for the Endovascular Treatment of Renal Artery Aneurysm

Keillyanne Jaira Ferreira Barros¹, Patrick Bastos Metzger¹, Fabio Henrique Rossi¹, Thiago Osawa Rodrigues¹, Samuel Martins Moreira¹, Ana Claudia Gomes Petisco², Nilo Mitsuru Izukawa¹, Antonio M. Kambara¹

ABSTRACT

Background: Renal artery aneurysms are rare and constitute a challenge to endovascular treatment. Our objective was to describe and analyze the techniques and strategies for the endovascular treatment of renal artery aneurysms verifying short and medium-term results in a consecutive series of cases. **Methods:** Retrospective study of procedures performed from January 2010 to December 2013, analyzing technical and therapeutic success, morbidity and mortality, the rate of endoleaks and reinterventions. **Results:** In a total of six patients treated, mean age was 41 ± 5 years and all patients were female. The majority of the patients had type 2 saccular aneurysms (83.3%). Remodeling techniques using stent and coils were used in four cases; embolization of renal polar branch was used in one case and treatment with a Multilayer® endoprosthesis in another case. Technical and therapeutic success rates were 100% and 83.3%, respectively. In one patient there was upper renal pole ischemia, which progressed to uncontrollable hematuria and pain, requiring nephrectomy. There were no deaths or occlusion of the native renal artery and its branches during the 1-year follow-up. **Conclusions:** Endovascular treatment of renal artery aneurysm proved to be a feasible alternative to conventional surgery with low morbidity. A detailed study of renal vasculature and aneurysm location determines the choice of the endovascular technique to be used. Type II renal artery aneurysm was the most frequent morphology observed and may be successfully treated by remodeling techniques using stents and coils.

DESCRIPTORS: Aneurysm. Renal artery. Embolization, therapeutic. Endovascular procedures.

RESUMO

Técnicas e Táticas no Tratamento Endovascular do Aneurisma da Artéria Renal

Introdução: Os aneurismas da artéria renal são raros e constituem um desafio ao tratamento endovascular. Nosso objetivo foi descrever e analisar as técnicas e táticas no tratamento endovascular do aneurisma da artéria renal, verificando os resultados a curto e médio prazos de uma série consecutiva de casos. **Métodos:** Estudo retrospectivo, de procedimentos realizados no período de janeiro de 2010 a dezembro de 2013, em que foram analisados: o sucesso técnico e terapêutico, a morbimortalidade, e a taxa de vazamentos e de reintervenções. **Resultados:** Em um total de seis pacientes tratados, a idade média foi de 41 ± 5 anos e todos eram do sexo feminino. A maioria apresentou aneurismas saculares tipo II (83,3%). Foram utilizadas técnicas de remodelamento com uso de stent e molas em quatro casos, embolização segmentar renal em um caso e tratamento com endoprótese Multilayer® em outro. O sucesso técnico e terapêutico foi de 100 e 83,3%, respectivamente. Em um paciente, houve isquemia de polo superior renal, que evoluiu para hematúria e dor incontrolável, necessitando de nefrectomia. Não ocorreram óbitos e nem oclusão das artérias renais nativas e de seus ramos durante o acompanhamento de 1 ano. **Conclusões:** O tratamento endovascular do aneurisma de artéria renal demonstrou ser uma alternativa viável à cirurgia convencional com baixa morbidade. O estudo detalhado da vascularização renal e da localização do aneurisma determina a escolha da técnica endovascular a ser utilizada. O aneurisma da artéria renal do tipo II foi a morfologia mais frequentemente encontrada e pode ser tratado com sucesso por técnicas de remodelamento com o uso de stent e mola.

DESCRIPTORES: Aneurisma. Artéria renal. Embolização terapêutica. Procedimentos endovasculares.

¹ Endovascular Intervention Center, Instituto Dante Pazzanese de Cardiologia, São Paulo, SP, Brazil.

² Medical Section of Vascular Echography, Instituto Dante Pazzanese de Cardiologia, São Paulo, SP, Brazil.

Correspondence to: Patrick Bastos Metzger. Avenida Dr. Dante Pazzanese, Setor de Hemodinâmica, 500 – Vila Mariana – CEP: 04012-909 – São Paulo, SP, Brazil.

E-mail: patrickvascular@gmail.com

Received: 01/03/2014 • Accepted: 03/03/2014

The renal artery aneurysm (RAA) is a rare event whose prevalence is 0.01%.^{1,2} In the last decade, with the use of non-invasive diagnostic methods, such as Doppler ultrasonography (DUS) and computed tomography (CT), the number of diagnosed cases has increased.³

Although the natural history of the RAA is scarcely known and symptoms are nonspecific or nonexistent, potential complications, such as embolization and rupture, are reported in 5% to 10% of cases, leading to a high mortality rate, especially in pregnant women or in patients with polyarteritis nodosa (PAN).^{4,5} Therefore, the indications for treatment include symptomatic patients, pregnant women or women of childbearing age, and asymptomatic patients with aneurysms > 2 cm or with PAN.^{3,6}

Both the conventional surgical treatment and kidney autotransplantation have mortality rate ranging from 0% to 4%, with a complication rate of 10% to 30%.^{7,8} In recent years, with the progress of endovascular treatment and development of new devices, RAAs have been approached with less morbidity and with preservation of the native vascular tree.⁹

The aim of this study was to describe and analyze the techniques and tactics of endovascular treatment of RAA, assessing technical and therapeutic success, morbidity and mortality, and the rate of endoleaks and reinterventions in a consecutive series of patients followed for one year.

METHODS

Study characteristics

This is a retrospective, longitudinal, observational study carried out in a referral center for cardiovascular pathologies. Inclusion criteria were the following: patients of both sexes with symptomatic RAA, RAA diameter > 2 cm, RAA in pregnant women or women of childbearing age, and RAA associated with PAN. Patients with serum creatinine > 2.0 mg/dL or creatinine clearance < 30 mL/min were excluded.

The therapeutic schedule was performed using CT in all cases; preoperative arteriogram was an optional diagnostic method. All tomographies were reconstructed in the OsiriX[®] MD software in three-dimensional mode and multiplanar reconstruction mode (Figure 1).

Endovascular planning

Previous angiotomography and/or arteriography disclosed the following: aneurysm morphology (saccular or fusiform), presence of draining branches, aneurysm neck extension, involvement of bifurcation areas, and the distance from the renal artery origin to the aneurysm and from the aneurysm to the renal artery bifurcation.

The planning of endovascular treatment of RAAs was performed according to their topographic¹⁰ classification into type I (aneurysms located in the main renal artery), II (aneurysms located in the hilum), and III (intrarenal aneurysms) (Figure 2).

Techniques and tactics for type I renal aneurysm

a) Endoprosthesis GORE[®] VIABAHN[®] (W. L. Gore & Associates Inc. – Flagstaff, United States)

This is a treatment option for type I RAA located up to 15 mm from the renal artery ostium or hilum without nurturing branches coming from the aneurysmal sac. When these limits are not taken into account, there is a risk of endoleaks and perpetuation of flow within the aneurysmal sac, with consequent therapeutic failure.

This endoprosthesis must not be used in type II RAA due to risk of covering important renal branches, or in type III RAA, due to its high profile and little flexibility to navigate thin distal vessels, as well as risk of thrombosis or thromboembolism when used in these scenarios.

b) Selective embolization with coils

It can be used in three types of aneurysms, but is better indicated for saccular aneurysms with neck < 4 mm in diameter or aneurysm/neck ratio > 2:1.⁹ In such cases, techniques that use microcatheters for superselective aneurysm catheterization are needed, as well microcoils with 0,018 profile. The authors prefer AZUR[®] coils (Terumo Interventional Systems, Somerset, United States) and the 2.4 F Progeat[®] microcatheter (Terumo Interventional Systems, Somerset, United States). An important point is that the size of the first coil must be equal to the aneurysmal sac, to allow a circular configuration within the aneurysm.

This technique should not be used in complex aneurysms, those with wide necks or when arterial branches leave the aneurysmal sac. In such cases, remodeling techniques are recommended.

Techniques and tactics for type II renal aneurysms

a) Multilayer[®] endoprosthesis (Cardiatis, Isnes, Belgium)

The Multilayer[®] endoprosthesis is used primarily for the treatment of peripheral aneurysms; however, its use in renal aneurysms has been reported in recent studies. The stent structure, consisting of several intertwined and connected layers, creates a configuration in multiple planes, which acts by slowing the turbulent flow within the aneurysmal sac, contributing to its thrombosis, while improving the laminar flow in the main artery and its branches.^{11,12}

Its little flexibility and high profile limit its use in type III aneurysms.

Download English Version:

<https://daneshyari.com/en/article/3011697>

Download Persian Version:

<https://daneshyari.com/article/3011697>

[Daneshyari.com](https://daneshyari.com)