

3. Optimal clinical care, key to prognosis of patients with critical ischemia.

**Luis M. Ferreira, Ricardo A. La Mura,  
Sergio A. Escordamaglia, Carlos Bleise,  
Pedro Lylyk**

Clínica La Sagrada Familia - ENERI  
José Hernández 1642 - CABA

## REFERENCES

1. Rana MA, Glociczki P. Endovascular interventions for infrapopliteal arterial disease: an update. *Semin Vasc Surg* 2012;25:29-34. <http://doi.org/vc9>
2. Verzini F, De Rango P, Isernia G, Simonte G, Farchioni L, Cao P. Results of the "endovascular treatment first" policy for infrapopliteal disease. *J Cardiovasc Surg* 2012;53(1 Suppl 1):179-8.
3. Fernández R, Gutiérrez S. El modelo angiosoma en la estrategia de revascularización de la isquemia crítica. *Angiología* 2012;64:173-82. <http://doi.org/f2jmkf>
4. Taylor GI, Palmer JH. The vascular territories (angiosomes) of the body: experimental study and clinical applications. *British J Plastic Surg* 1987;40:113-41. <http://doi.org/cwmd6x>
5. Alexandrescu V, Söderström M, Venermo M. Angiosome theory: fact or fiction? *Scand J Surg* 2012;101:125-31. <http://doi.org/vdb>
6. Söderström M, Albäck A. Angiosome-targeted infrapopliteal endovascular revascularization for treatment of diabetic foot ulcers. *J Vasc Surg* 2013;57:427-35. <http://doi.org/vdc>
7. Alexandrescu V, Vincent G. A Reliable Approach to diabetic neuroischemic foot wounds: below-the-knee angiosome-oriented angioplasty. *J Endovasc Ther* 2011;18:376-87. <http://doi.org/bm76cd>
8. Kabra A, Suresh KR, Vivekanand V. Outcomes of angiosome and non-angiosome targeted revascularization in critical lower limb ischemia. *J Vasc Surg* 2013;57:44-9. <http://doi.org/vdd>

REV ARGENT CARDIOL 2014;82:510-512 - <http://dx.doi.org/10.7775/rac.v82.i6.4383>

## Uterine Leiomyomatosis Extending into the Cardiac Chambers: Two Different Cases

Intravenous leiomyomatosis is a rare condition typically occurring in the fifth or sixth decade of life in women with a benign uterine fibroid tumor, with invasion of the venous system. (1) Cases of intracardiac extension account for 10%. (2) Surgical treatment is recommended due to risk of embolism from right cardiac chambers, and tricuspid valve obstruction associated with sudden death. (3) Only a few cases have been reported in the literature, and most of them include signs of heart failure in the clinical presentation. (1)

## CASE REPORT 1

A 59-year-old patient without cardiovascular risk factors presented with edemas and ochre discoloration in the lower limbs (LL).

The echo-Doppler of the LL and abdominal ultrasound detected a uterine tumor and thrombosis in the inferior vena cava (IVC). Initially, gynecological surgery was not performed, and the patient was started on anticoagulation therapy with acenocoumarol. The patient progressed with edemas, abdominal disten-

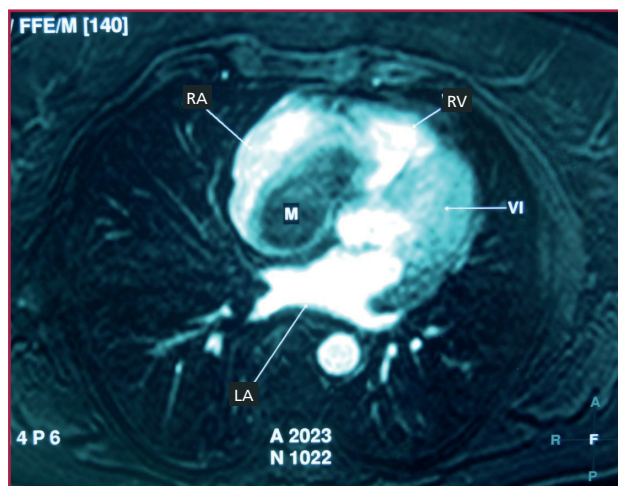
sion, and progressive dyspnea, and a new abdominal ultrasound (US) revealed uterine tumor growth and IVC thrombosis. Our department of gynecology evaluated her and recommended surgical removal of the tumor. A total adnexo hysterectomy was performed, removing a 3-kg tumor. Pathological examination revealed uterine leiomyomatosis. The patient progressed with dyspnea and LL edema and transesophageal echocardiography confirmed a tumor in the right atrium, obstructing the right ventricular inflow tract. Thoracic and abdominal MRI angiography confirmed tumor expansion into the IVC and right cardiac chambers (Figure 1) and abdomen, and cardiac surgery was decided. Excision of the IVC and right atrial tumor was performed with a midsternal and abdominal right retroperitoneal approach (Figure 2). During the procedure, extracorporeal circulation time was 105 minutes, total circulatory arrest was 15 minutes, and hypothermia was 23 °C. The patient is currently asymptomatic.

## CASE REPORT 2

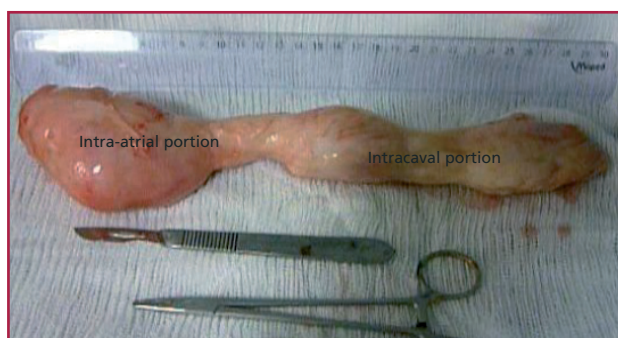
This case corresponds to an asymptomatic 51-year-old patient who, in a routine cardiovascular examination, was diagnosed a tumor involving the lower retroperitoneal space with IVC and right cardiac chamber invasion. Initially, a midsternal approach was the option to remove the tumor and perform etiological diagnosis. Surgery was performed under extracorporeal circulation, hypothermia (20 °C) and circulatory arrest. The result of the excision was a hard tumor, which was affecting the right chamber lumen from the IVC, but without any evidence of myocardial infiltration. Post-operative course was satisfactory, and the patient was scheduled for a second stage IVC and retroperitoneal exploration. Pathological examination confirmed the diagnosis of leiomyoma.

The patient was away for 18 months since the first procedure, and returned totally asymptomatic for outpatient consultation. A new CT scan with contrast showed the same retroperitoneal images, with extensive intravenous invasion into the right iliac vein, IVC, and again complete filling of the right atrium, right ventricle, and pulmonary artery. Knowing the anatomopathological report, complete leiomyoma and intravenous proliferation resection was proposed in a one-stage operation.

Gynecological, peripheral vascular and cardiovascular teams were involved in the procedure. A total adnexo hysterectomy and resection of multiple uterine myomas extending into the perirectal area and iliac vessels (Figure 3) were performed. One of the myoma branches penetrated the distal part of the right iliac vein, and from there, blocked almost all the vena cava lumen towards the right cardiac chambers and pulmonary artery. The next step consisted of resternotomy, cannulation of the ascending aorta, superior vena cava and left femoral vein (not involved), and resection of intracardiac leiomyoma via right atriotomy using ex-



**Fig. 1.** MR angiography image. RA: Right atrium. RV: Right ventricle. LV: Left ventricle. LA: Left atrium. M: Myoma occupying the right atrium.



**Fig. 2.** Uterine fibroid 30 cm long, with intra-atrial portion of 10 cm and intracaval portion of 20 cm.

tracorporeal circulation without aortic clamping (Figure 4). Finally, IVC was explored and leiomyoma was totally resected from its proliferation site in the right iliac vein to the diaphragm. Thus, the leiomyoma was totally resected in a one-stage operation. Postoperative course was favorable and without complications. The patient was discharged 7 days after surgery.

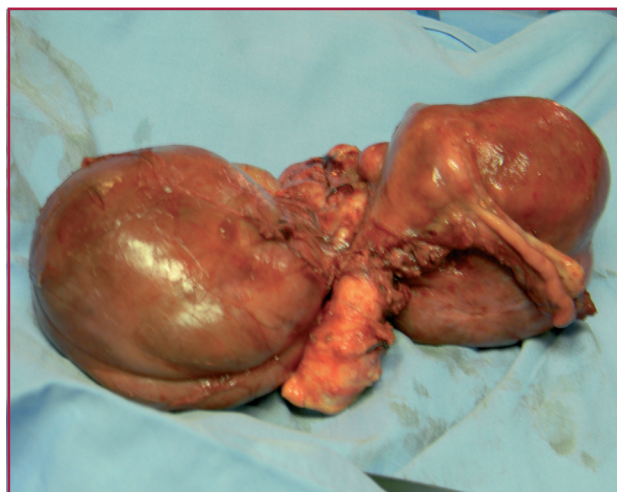
Intravenous leiomyomatosis is a rare condition typically occurring in 50-60 year-old women with a benign uterine fibroid tumor, invading the venous system; cases of intracardiac extension account for approximately 10%. (1, 2) Surgical treatment is generally recommended due to the risk of embolism from right cardiac chambers or tricuspid valve obstruction. (1)

To date, few patients have been described, and fewer than 100 cases have been reported in the world. Most of them present symptoms of heart failure, as opposed to one of our patients, who was completely asymptomatic and without lower limb edemas. (1, 3)

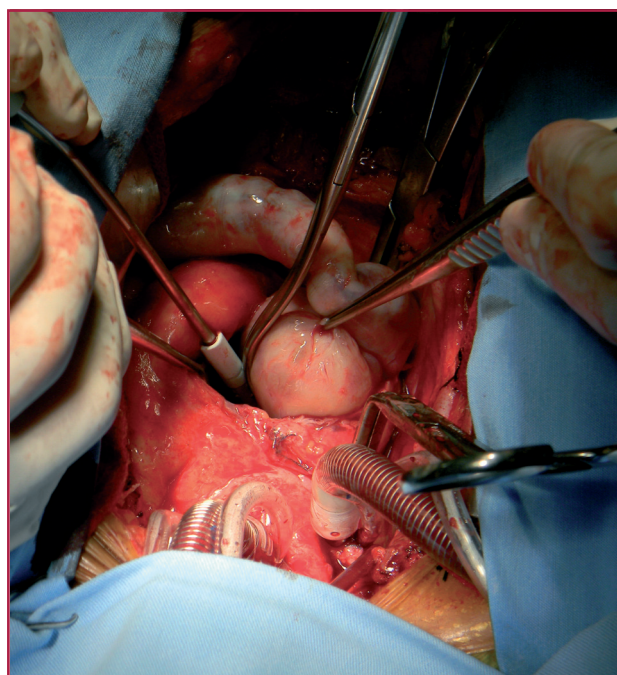
Some elements from the medical record would help differentiate between a metastatic tumor and

vena cava thrombosis: previous kidney surgery, bone fractures, previous pulmonary embolism, or deep vein thrombosis. (4) There are reports of intravenous myomatosis occurring several years after hysterectomy. (1) When patients exhibit diffuse symptoms, one of the diagnostic examinations to perform before hysterectomy due to uterine leiomyoma is abdominal Doppler US to detect extension into the inferior vena cava. (5)

According to the cases reported to date, sternotomy and adnexo hysterectomy for total resection of the pelvic tumor with intravenous invasion is the



**Fig. 1.** Uterine tumor extending into the iliac vein and perirectal fat.



**Fig. 1.** Intraoperative image showing right atriotomy and intracardiac tumor resection.

treatment of choice. (6) Our second case demonstrated the recurrence of leiomyomatosis with continuous extension into the pulmonary artery after a little more than a year of incomplete treatment involving resection of the intracardiac portion only. While this is a histologically benign tumor, its growth is fast. Fortunately, our patients recovered without complications, and tumor resection was complete in both cases. To date, they are both in good clinical condition.

**Guillermo Vaccarino<sup>MtSAC</sup>, Christian Gil,  
Pablo Desmeri, Diego Herrera Vega,  
Néstor Bustamante, Marcelo Guzmán**

Hospital Universitario Austral - Department of Cardiovascular  
Surgery. Pilar, Pcia. de Buenos Aires, Argentina

## REFERENCES

1. Topcuoglu MS, Yaliniz H, Poyrazoglu H, Tokcan, Demir SC, Bozkurt A, et al. Intravenous leiomyomatosis extending into the right ventricle after subtotal hysterectomy. *Ann Thorac Surg* 2004;78:330-2. <http://doi.org/bwkhwr>
2. Luciani N, Anselmi A, Glieda F, Martinelli L, Possati G. Diagnostic and surgical issues in emergency presentation of a pelvic leiomyoma in the right heart. *Ann Thorac Surg* 2009;87:1589-92. <http://doi.org/cvcn4>
3. Song BG, Park YH, Kang GH, Chun WJ, Oh JH. Intravenous leiomyomatosis with intracardiac extension. *Asian Cardiovasc Thorac Ann* 2011;19:179. <http://doi.org/vdg>
4. Okamoto H, Itoh T, Morita S, Matsuura A, Yasuura K. Intravenous leiomyomatosis extending into the right ventricle: one-stage radical excision during hypothermic circulatory arrest. *Thorac Cardiovasc Surg* 1994;42:361-3. <http://doi.org/dbjts7>
5. Liu W, Liu M, Xue J. Detection of intravenous leiomyomatosis with intracardiac extension by ultrasonography: A case report. *Oncology Letters* 2013;6:336-8.
6. Stolf NA, Santos GG, Haddad VL, Simões RM, Avelar SF Jr, Ferreira FH Jr, et al. Successful one-stage resection of the intravenous leiomyomatosis of the uterus with extension into the heart. *Cardiovasc Surg* 1999;7:661-4. <http://doi.org/ccsxjv>

REV ARGENT CARDIOL 2014;82:512-513 - <http://dx.doi.org/10.7775/rac.v82.i6.4303>

## Usefulness of Angio-Seal™ as Mechanical Suture in Patients Undergoing Femoral Coronary Angioplasty

The diagnosis and endovascular treatment of atherosclerotic coronary disease is growing day by day, because it is a minimally invasive method requiring short hospital stay, which significantly reduces costs compared with myocardial revascularization surgery.

This technique is not free from complications. The most common one is the site of puncture, varying from 1% to 5% depending on the working groups, and reaching up to 15% in patients under multiple antiplatelet therapies, such as the combination of aspirin (AAS), clopidogrel, prasugrel, ticagrelor, bivalirudin, and IIb/IIIa inhibitors.

After performing femoral catheterization, different methods can be used to achieve hemostasis at the

puncture site. The cheapest and most commonly used method is manual compression, and mechanical methods include Angio-Seal™, Femostop™, and Perclose™.

In our catheterization laboratory, we perform a wide range of endovascular diagnostic and therapeutic femoral procedures in coronary and extra-coronary territories, and the 6 or 8 French (Fr) Angio-Seal™ device is used in patients who are treated with two or more antiplatelet drugs.

The Angio-Seal™ device is a type of mechanical closure consisting of an anchor (2 mm wide x 10 mm long), a bovine collagen plug weighing about 18 mg, and a suture that connects the anchor to the outside. It is available in two sizes: 6 and 8 Fr. Figure 1 shows how the Angio-Seal™ device occludes the puncture site.

The purpose of our study was to assess the vascular complications following coronary angioplasty using Angio-Seal™ as mechanical closure in patients treated with two or more antiplatelet drugs and anticoagulation.

Vascular complications include hematoma at the puncture site (a palpable mass > 6 cm in diameter), pulsatile active bleeding in the area, pseudoaneurysm, absence of pulse and/or limb ischemia, and infection at the puncture site.

An echo-Doppler to confirm pseudoaneurysm and a soft-tissue ultrasound to document the size of the hematoma were performed.

The study was carried out at the cardiac catheterization laboratory of the Medical Campus of the Argentine Federal Police. It was an observational, retrospective study including 1,854 patients with urgent or elective coronary angioplasty, between January 2001 and January 2014.

All patients signed the informed consent form, were over 18 years of age, and only underwent coronary angioplasty.

All patients received ASA, beta blockers, and clopidogrel. Clopidogrel had two therapeutic schedules: one with a loading dose of 300 or 600 mg for urgent angioplasty, or 75 mg/day a week before the procedure for patients with elective angioplasty. After that, the scheme was 75 mg/day during hospitalization, with duration at the discretion of the treating physician.

Use of abciximab, tirofiban, eptifibatide or bivalirudin, as well as low-molecular-weight heparin, depended on the medical condition required for the intervention and the risk categorization of the intervention according to the history and comorbidities of each patient, as described in the literature. In 1,800 patients 6 Fr introducers were used, and in the remaining 54 patients 7 and 8 Fr introducers.

Once the procedure was over and the Angio-Seal™ was aseptically implanted in the catheterization laboratory, a superficial bandage was applied and the patient was transferred to the Coronary Intensive Care Unit.