IMAGES IN CARDIOVASCULAR SURGERY

# RADIAL ARTERY PSEUDOANEURYSM: WHEN ENDOVASCULAR TREATMENT IS FORCED AND OVERPRESCRIBED

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***ABSTRACT***

*Pseudoaneurysms are the result of arterial injury, whether iatrogenic or due to trauma. They are a late complication of trauma. The incidence of pseudoaneurysms in upper extremities is less than in lower extremities. Delayed treatment leads to hemorrhage, edema and nerve compression. In turn, the potential complication of pseudoaneurysm in the upper limbs is the loss of fingers. A case of pseudoaneurysm diagnosis and treatment until resolution is presented. Surgery with resection of the pseudoaneurysm and arteriography for injury was the best treatment for this particular case, after attempting to seal the neck of the false aneurysm with endovascular treatment and double-balloon and extrinsic compression.*

## INTRODUCTION

Pseudoaneurysms of the upper limbs are rare lesions, though of great importance due to their potential complications, such as thromboembolism and rupture.[1] The puncture of the radial artery is frequently performed for invasive hemodynamic monitoring, vascular access for diagnosis and/or treatments, etc. Complications of this procedure have been described in small series of cases, but their surgical treatment has not been fully explained. Understanding the signs and symptoms of these complications is imperative to offer optimal treatment.[2] Delayed treatment of pseudoaneurysms leads to hemorrhage, venous edema and regional nerve compression as a result of their increased size.[3]

Their etiology, either traumatic or iatrogenic, due to puncture for monitoring or catheterization, is varied with an incidence < 0.1%. Their treatment must be administered quickly in order to preserve the hand and fingers.[4]

Below there is a description of the case of a radial artery pseudoaneurysm in a young female patient, who due to delayed optimal treatment developed the complications of this pathology, including active bleeding, a tumor with compressive neuropathy and skin ulceration. Many of these are avoidable if the appropriate early treatment for this case is chosen.

## CLINICAL CASE

A 32-year-old female patient was admitted to the intensive care unit with respiratory insufficiency, requiring orotracheal intubation in assisted mechanical ventilation, and hemodynamically unstable, with inotropic requirement for hemodynamic support. After invasive monitoring of median blood pressure, she developed a painful pulsatile tumor at the site of the right radial artery puncture. A pseudoaneurysm was diagnosed and one-week compression bandaging was prescribed. Subsequently, skin ulceration and active bleeding were observed with no hemodynamic compromise of the patient. The case was referred to the Hemodynamics Service, where the endovascular treatment of the pseudoaneurysm was prescribed (Figure 1). A double-compression technique – extrinsic with ultrasound transducer and intrinsic with balloon – was used at the site of the contrast leak (Figure 2). After three hours of endovascular treatment, it was possible to slow down the extravasated flow but this technique failed to exclude the pseudoaneurysm with thrombosis of its neck (Figure 3).

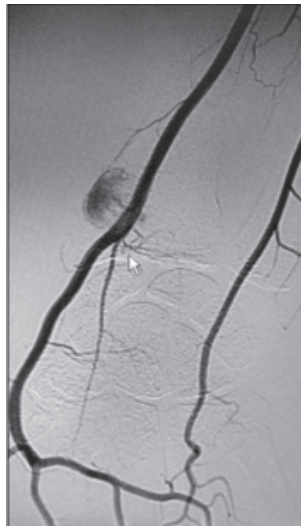

**Figure 1.** Angiography, contrast leak in radial artery.

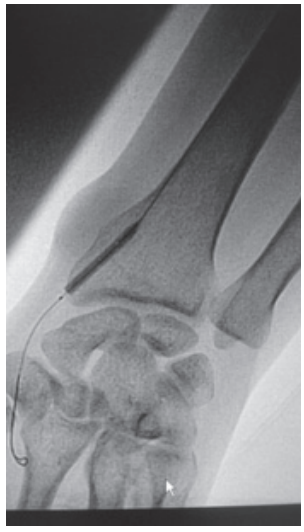

**Figure 2.** Endovascular compression with balloon.

After 12 hours of endovascular treatment, the painful ulcerated pulsatile tumor with active bleeding continued, with no therapeutic benefits being obtained with this method.

On the following day, the case was referred to the Vascular Surgery Service, where immediate surgical treatment to exclude the pseudoaneurysm was prescribed with its resection, bleeding control and cutaneous plastic repair of the ulcerative lesion.

In forty minutes of surgery, all the therapeutic benefits needed to solve this pathology were achieved.

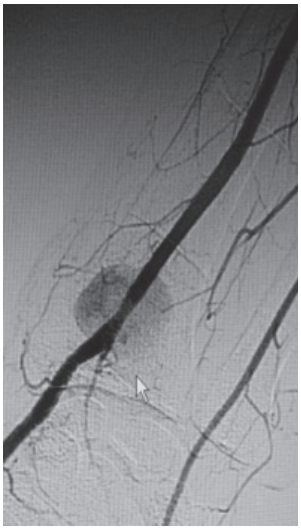

**Figure 3.** Control after endovascular treatment.

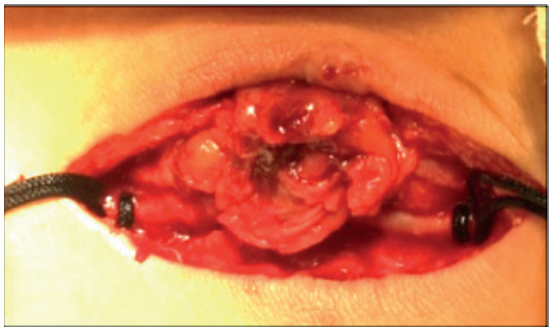

**Figure 4.** Proximal and distal control of the lesion.

A longitudinal incision was performed on the projection of the right radial artery, with proximal and distal control of the lesion. By repairing the artery with loops, with no need for clamping, bleeding was controlled (Figure 4). Then, the incision was extended to unify the approach, proceeding to the resection of the pseudoaneurysm by direct visualization of the 1-mm-long neck of its sack (Figure 5). The arteriorraphy of the arterial lesion was performed with 7-0 Prolene suture, achieving a satisfactory bleeding control result and also keeping the radial artery unharmed (Figure 6).

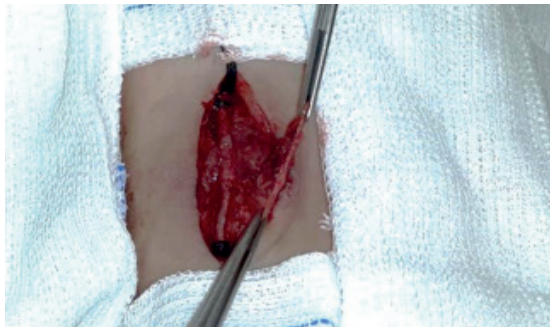

**Figure 5.** 1-mm-long neck of the pseudoaneurysm.

## CONCLUSION

Whatever the form of endovascular treatment chosen, it always is invasive, costly and time-consuming and uses nephrotoxic contrast. In this case, surgery was the proper treatment because it allowed the resection of the pseudoaneurysm together with the skin ulceration and, with a 2.5-cm-long incision, it was possible to work on the repair of the arterial lesion in a comfortable way (Figure 7).

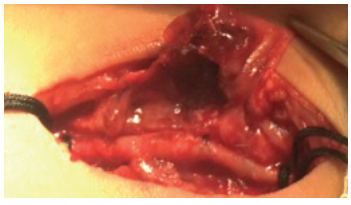

**Figure 6.** Resection of the pseudoaneurysm with neck ligation.

The endovascular treatment in this case delayed surgery, which did have therapeutic success in solving the problem not only by excluding the pseudoaneurysm but also by removing the thrombus causing compressive neuropathy due to the relation to the median nerve and the hyperalgesia described (Figure 8).

Risk factors leading to iatrogenic pseudoaneurysms are anticoagulation or antiplatelet therapy before arterial catheterization, age over 60 years, female sex, catheters above 7 French units, obesity, and inappropriate compression of the arterial puncture site.[5]

The patient concerned is a 32-year-old obese woman. In her case, while no catheters over 7 French units were used in monitoring the median blood pressure, her sex and obesity were factors leading to this kind of lesion. In this type of patients, it is fundamental to perform effective and careful compression to avoid this kind of complications in invasive treatments for arterial monitoring and/or diagnosis.

It is known that a high percentage of these patients solve these lesions with appropriate compressive bandaging, and it is in these cases where it is essential to take initial measures to avoid later skin ulceration in young patients.

In this case, where ballooning was used continuously in a platelet-free artery, a reactive spasm was observed, as shown in Figure 3, and this can damage the arterial endothelium in a healthy artery.

Doctors must be aware of the different treatment options for a certain pathology; this therapeutic diversity opens up a range of specialties that can solve the case. However, professionals must know about the limitations of the various methods they use so as to focus on the best treatment for a given case in each particular patient, forgetting about the personal benefit. ■

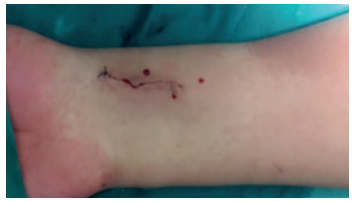

**Figure 7.** Surgical wound 2.5 cm long in immediate postoperative period.

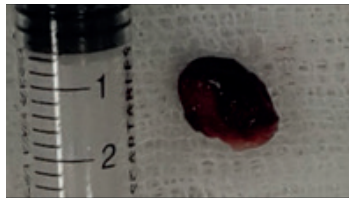


**Figure 8.** Thrombus extracted.

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# CONGRESOS ERAN LOS DE ANTES...

Algunas Sociedades Cardiológicas Europeas han reaccionado ante la publicación del nuevo código ético de la alianza Eucomed que se impondrá a partir de enero de 2018. Eucomed está conformada por una alianza empresaria de aproximadamente 25000 compañías que abarcan el desarrollo, producción y distribución de más de 500.000 productos médicos.

Entre los puntos controvertidos podemos mencionar que:

- se establecen guías con los criterios que debe cumplir un congreso médico para ser aceptable para patrocinio por la industria,
- desmarca el patrocinio de la industria de cualquier cosa relacionada con ocio o programa social,
- establece que a partir del 1 de enero de 2018 las compañías (adheridas a Eucomed) no proporcionarán soporte económico directo a los denominados "asistentes pasivos", sólo a los ponentes y a las personas con un papel específico en el programa,
- define que las compañías podrán seguir financiando costos relacionados con congresos pero de forma diferente, a través de "Becas de educación". Estas becas no se darán directamente a los profesionales, sino a través de organizaciones o entidades.

Dr. Patrick Serruys, editor jefe de la revista EuroIntervention órgano oficial de la Asociación Europea de Intervencionismo Cardiovascular *(EAPCI)* junto al Chairman del PCR (2015) William Wijns y al presidente de *(EAPCI)* publican una editorial donde fijan la siguiente posición:

- la primera crítica es que este nuevo código es una iniciativa unilateral ya que está hecho "por la industria y para la industria" sin ningún tipo de consulta o contacto con los médicos,
- la desaparición del soporte económico a los médicos tendrá consecuencias inmediatas calculando una perdida de hasta un 50% de los asistentes,
- la imposibilidad para asistir a los congresos se traducirá en una reducción de oportunidades de mantener la formación médica continua, cosa que puede tener un impacto directo en el manejo de los pacientes,
- el sistema abre la puerta a que las compañías puedan ser mucho más selectivas con respecto a las organizaciones y congresos que deciden patrocinar dejando de lado los objetivos de las distintas sociedades médicas.

Haciendo otra lectura, el código tiende a favorecer a los profesionales "preferidos" de una empresa o de varias (popes) en detrimento de aquellos que son independientes, siendo los más jóvenes los que poseen menos posibilidades. Asimismo, consideran que la formación continua quedará en las manos de la buena voluntad y de la iniciativa de cada médico en particular. Otro punto también cierto es que muchas sociedades médicas consideran a los congresos como fuente de financiación.

Hoy cumplimos con nuestro XXV Congreso, que en realidad en un comienzo se denominó Encuentro, creciendo en todos los aspectos de la especialidad, tanto en número de colegiados, así como en los objetivos para con nuestra principal cita académica. Hemos sopesado los distintos avatares económicos, acostumbrados a los desafíos diarios de nuestra profesión y, a diferencias de otras sociedades, el compromiso de los miembros del colegio es el principal sostén de nuestro evento. Es verdad que gracias a las empresas solventamos muchos de los gastos, pero tuvimos bien en claro de la necesidad de mantener nuestra independencia y, por sobretodo, nuestra transparencia. Nos reunimos una vez más buscando la excelencia, incluyendo a los distintos centros que ejercen la especialidad con el mejor nivel en búsqueda de la "verdad sospechosa", como la definió Karl Popper, propia de la ciencia más pura y dejando de lado dogmas e imposiciones.

Congresos "como los de antes" en donde los distintos centros exponían sus experiencias, sumada a la experiencia de extranjeros, es la principal propuesta de este Veinticincoavo evento y he aquí la gran diferencia con aquellas sociedades que desvirtuaron sus objetivos.

*Dr. Juan Esteban Paolini*

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