

Scientific letters

Type A Iatrogenic Aortic Dissection Following Catheterization Without Coronary Involvement: Long-term Prognosis**Discción iatrogénica de aorta por catéter tipo A, sin afectar a la coronaria: estudio pronóstico a largo plazo****To the Editor,**

Type A aortic dissection involves high mortality and typically requires surgery. Although it is usually spontaneous, cases have been observed after surgical procedures and, less frequently, interventional procedures.^{1–3} Due to its low frequency (< 0.1%), there are few data on this topic.¹ In 2002, the International Registry of Acute Aortic Dissection (IRAD) reported 26 cases (69% postoperative and 27% due to catheterization) out of a total of 723.¹ The epidemiology varied when compared with spontaneous presentations: those with iatrogenic aortic dissection were older, were more frequently diabetic or hypertensive, and had a greater degree of atherosclerosis, or a history of coronary bypass.

Symptoms also varied: patients with iatrogenic dissection had less back pain or, when present, it had different characteristics, a higher frequency of hypotension and shock, and a high probability of ischemia and myocardial infarction (36% and 15%, respectively).

Although the prognosis of iatrogenic presentations was associated with high mortality in the past,¹ recent registries, such as the German GERAADA, indicate a mortality rate that is similar to spontaneous dissection.²

Our objective was to analyze the incidence, characteristics, and prognosis of iatrogenic aortic dissection following catheterization.

Between October 2000 and July 2014, we performed 58 518 procedures, 36 372 of which were diagnostic and the remaining 22 146 were therapeutic. We identified 14 patients with dissection of the descending aorta/arch, without coronary dissection. The incidence was 0.02%, with a mean age of 68.5 years and a predominance of men (Table). The main reason for catheterization was chest pain along with acute coronary syndrome (10 cases). Five patients were treated urgently, 3 of whom had ST elevation. In 4 patients, the procedure was exclusively diagnostic, while 7 patients underwent successful coronary intervention. Guiding

Table
Individualized Summary for Each of the Patients

Case	Sex	Age, y	CVRF	Predisposing condition/aortopathy	Reason for catheterization	Type/access/indication ^a	Cause/moment of dissection ^b	Type/dissection location ^c	Year/outcome
1	Male	74	HTN, smoker	Abnormal RC	NSTEACS	Elective/right femoral/therapeutic	RC catheterization/AL2	1, right sinus	2009/good
2	Male	67	DLP	No	STEACS	Urgent/right femoral/therapeutic	Trunk catheterization/AL3	3, ascending and descending aorta	2003/exitus
3	Male	61	DLP, smoker	No	Unstable angina	Elective/left radial/diagnostic	Moving 0.35 guide forward by subclavian	Unclassifiable/aortic arch	2011/good
4	Male	65	HTN, DLP, smoker	No	NSTEACS	Elective/left radial/therapeutic	RC catheterization/AR1	1, right sinus	2013/good
5	Male	73	HTN, DLP, DM, smoker	No	NSTEACS	Urgent/right femoral/therapeutic	Trunk catheterization/XB3.5	3, ascending aorta	2010/good
6	Male	71	DLP, smoker	No	Stable angina	Elective/right radial/therapeutic	PTCA in RC/JL4 diagnostic	1, right sinus	2014/good
7	Male	56	HTN, DLP, smoker	No	NSTEACS	Urgent/left radial/therapeutic	RC catheterization/JR4	1, right sinus	2013/good
8	Male	71	HTN, DLP, DM, smoker	Infrarenal aortic aneurysm	NSTEACS	Elective/right femoral/therapeutic	Trunk catheterization/XB3.5	1, left sinus	2008/good
9	Male	76	DLP, DM	No	STEACS	Urgent/right femoral/diagnostic	Trunk catheterization/AL2	1, left sinus	2006/good
10	Female	77	HTN, DLP	No	STEACS	Urgent/right femoral/therapeutic	Moving balloon forward in RC/JR4 guide	1 right sinus	2005/good
11	Male	59	HTN, smoker	No	NSTEACS	Elective/right femoral/diagnostic	Moving 0.35 guide forward	3, arch and descending	2004/good
12	Female	67	HTN, DLP	No	Unstable angina	Elective/right femoral/therapeutic	RC catheterization/AL2	3, right sinus	2003/good
13	Female	61	HTN, DLP	No	Valve study	Elective/right femoral/diagnostic	RC catheterization/AL2	1, right sinus	2002/good
14	Female	82	HTN	No	Stable angina	Elective/left radial/therapeutic	Trunk catheterization/XB3.5	1, left sinus	2012/good

PTCA, percutaneous angioplasty; AL, Amplatz catheter, left coronary; AR, Amplatz catheter, right coronary; RC, right coronary; DLP, dyslipidemia; DM, diabetes mellitus; CVRF, cardiovascular risk factors; HTN, hypertension; JL, Judkins catheter, left coronary; JR, Judkins catheter, right coronary; STEACS, ST-elevation acute coronary syndrome; NSTEACS, non-ST-elevation acute coronary syndrome; XB, extra-backup catheter ("high support" for left coronary; all are guides).

^a Therapeutic: when guide catheters were used to perform interventionism, whether completed or not.

^b In therapeutic catheterization, the catheter used is a guide, except when otherwise indicated.

^c The number indicates the type according to the Dunning et al classification.³

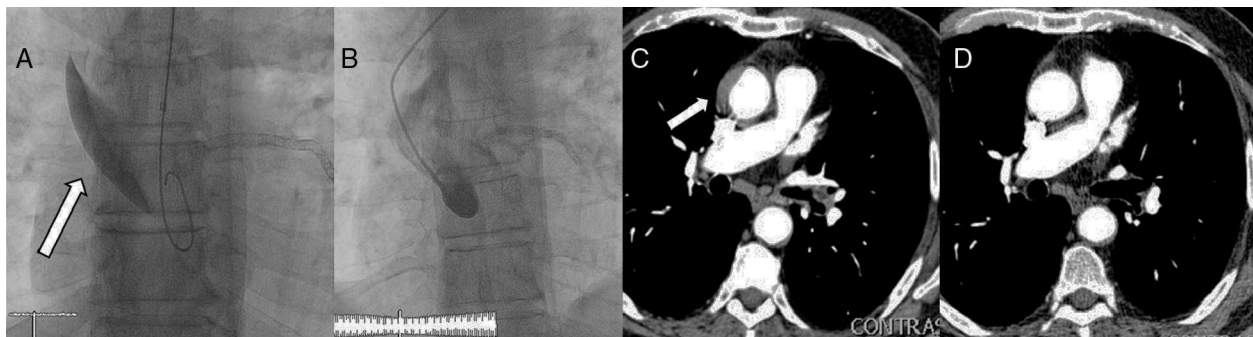


Figure. Patient number 5 (Table). Arrow: Dissection; A: Acute moment, which required cessation of the procedure; B: 3 days later, aortogram showing definite improvement; at that time, angioplasty was done in the anterior descending artery without complications; C: Tomography showing the initial hematoma/thrombotic dissection at the ascending aorta (A); D: Follow-up tomography 9 months later (at the same height of C) showing complete symptom resolution.

catheters were used in 10 patients, but the intervention had to be postponed due to the dissection. The approaches used were as follows: right femoral artery in 9 patients (64.3%), left radial in 4, and right radial in 1. All the radial approaches were performed from 2011 onward. The average contrast amount was 241 mL, fluoroscopy time was 26.3 minutes, and total time was 89.3 minutes. Presentation was acute in all patients and coincided with the catheterization of a vessel in 10 patients. In general, dissection occurred with 6-Fr catheters (Amplatz in 6 patients, extrabackup in 3, and Judkins in 3) and 2 with the 0.35" guide. Twelve patients received acetylsalicylic acid, 4 in conjunction with clopidogrel, and 1 in addition to fibrinolysis with tenecteplase. All patients received anticoagulants during the procedure.

During a mean follow-up of 62.4 months, there was 1 hospital death. None of the other patients who had been treated conservatively developed complications secondary to dissection, progression, ischemia, pain, or recurrence (Table).

There are few data on this complication, and published articles are limited to small case series or case reports. In addition, most include dissections of the ascending aorta and those occurring after dissection in a coronary artery.^{3,4} Here, we have excluded this type because the access port is different. In the coronary arteries, conservative management has been described with good results if the vessel continues to have good flow and the dissection is small⁴; if not, implanting a stent at this point would seal the flap and would generally resolve the problem satisfactorily.^{3,4} In 2002, Dunning et al³ published a series of 9 patients with coronary dissection extending to the aorta (incidence, 0.02%) and proposed a classification in 3 grades: type 1, dissection limited to the sinuses of Valsalva; type 2, dissection of the ascending aorta outside of the sinuses < 4 cm; and type 3, dissection \geq 4 cm. These authors proposed that stent implantation was sufficient in the limited forms, but those with type 3 required surgery.³

Our series is different since coronary intervention does not resolve the complication. Furthermore, indicating complex surgery of the ascending aorta could be catastrophic in patients who are often under the effects of intense antithrombotic treatment and have had a recent myocardial infarction.^{1–4} It is therefore a relevant complication considering the volume of procedures performed in our setting.⁵

After following-up, our patients for more than 5 years on average, we have seen excellent outcomes, regardless of the access

used (radial or femoral), even though many continued to receive intense antithrombotic treatment when their condition was acute. The profile of the patients affected with this complication is that of a male in his sixties, with cardiovascular risk factors (mainly atherosclerotic-ischemic), who undergoes a complex procedure (generally therapeutic) with difficult coronary catheterization.

Based on this information, we can conclude that if there are no important symptoms, the dissection is small and the imaging studies show no progression (Figure), it seems reasonable to follow a conservative strategy. If not, surgery may need to be considered.

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