

Iatrogenic dissection of subclavian artery during transradial coronary intervention.

Dissection iatrogène de l'artère sous cavière durant une coronarographie par voie radiale.

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Résumé

La dissection de l'artère sous Clavière est une complication rare du cathétérisme trans radial. Sa prise en charge n'est pas codifiée. Nous rapportons un cas de dissection de l'artère sous Clavière droite, traitée de façon conservatrice avec une évolution favorable.

Mots-clés

Coronarographie, dissection, complication, artère sous clavière.

Summary

Subclavian artery dissection is a rare complication of transradial cardiac catheterization. There is no established protocol for its management. We describe a case in which dissection of the right subclavian artery was treated conservatively with an excellent outcome.

Keywords

Coronary angiography, percutaneous coronary intervention, dissection, complication, subclavian artery

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INTRODUCTION

Transradial cardiac catheterization and percutaneous coronary intervention (PCI) are increasingly being performed worldwide in elective and emergency procedures [1, 2], with many centers adopting the transradial route as their first choice of arterial access. Physicians and patients both favor the transradial route as it is associated with fewer bleeding [3] and access complications, higher patient comfort level, earlier patient mobilization, and early discharge from hospital. Dissection of the subclavian artery during routine cardiac catheterization is an unusual and a rarely reported complication.

Conservative management of this vascular injury can avoid the sequelae of high-risk surgical repair.

CASE REPORT

A 61-year-old woman with hypercholesterolemia, hypertension and type 2 diabetes mellitus, was admitted for instable angina. Clinical examination and laboratory studies revealed no particular findings and Troponin level was negative. Electrocardiogram on admission was normal. She underwent coronary angiography via the right radial artery, which revealed a significant lesion of proximal anterior descending artery; the decision was made to perform a percutaneous interventional procedure in said lesion.

The intervention was carried out via right radial approach using a 6-Fr EBU 3.5 guiding catheter. During the procedure, a 0.035-inch J-tipped guide wire could not cross the right subclavian artery; control angiography revealed a dissection of the proximal portion of the right subclavian artery (Fig. 1).

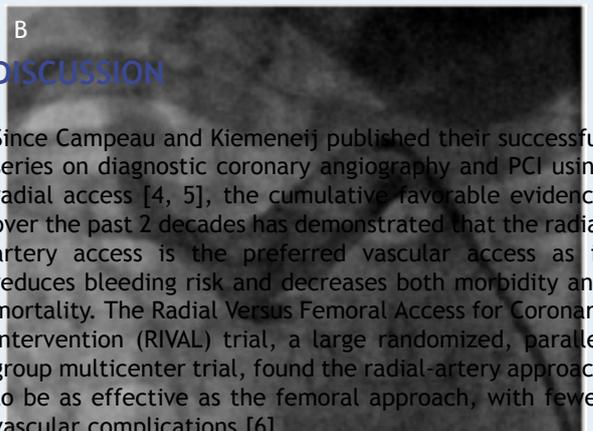
The patient reported mild pain in the right clavicular region, with no other symptoms. Procedure was completed through a right femoral access with implantation of a drug-eluting stent in the proximal portion of the LAD.

At the end of the procedure, control angiography revealed the persistence of the dissection, with no deterioration of the blood flow in the subclavian artery or in any of its branches.

Three months later, the patient, who had remained asymptomatic until then, was readmitted for instable angina. Coronary angiography was performed via the right femoral artery and demonstrated the absence of restenosis or new coronary artery lesions and the persistence of the dissection of the subclavian artery (Fig.2). Artery was patent with normal blood flow. No further intervention was carried.



Figure 1 : Angiogram revealing a dissection of the proximal portion of the right subclavian artery (arrow)



DISCUSSION

Since Campeau and Kiemeneij published their successful series on diagnostic coronary angiography and PCI using radial access [4, 5], the cumulative favorable evidence over the past 2 decades has demonstrated that the radial artery access is the preferred vascular access as it reduces bleeding risk and decreases both morbidity and mortality. The Radial Versus Femoral Access for Coronary Intervention (RIVAL) trial, a large randomized, parallel group multicenter trial, found the radial-artery approach to be as effective as the femoral approach, with fewer vascular complications [6].

Management of vascular complications remains an important challenge for interventional cardiology. Iatrogenic dissection of the subclavian artery during diagnostic catheterization, first described in 1994 [7] is

infrequently reported, probably reflecting both its rarity and a reluctance to report procedure complications. There is, thus, no established protocol for its management. Intervention in this region has been well documented in the setting of atherosclerotic stenosis or occlusion. It has though, only rarely been described as treatment for acute dissection, which may complicate catheterization [8, 9], angioplasty [10] or may occur spontaneously [11].

In one case, the authors reported the use of conservative management [7] and did not perform angiographic follow-up to ensure the complete resolution of the complication. In the most published cases, the dissection occurred during catheterization of the mammary artery via femoral artery [8, 9, 10]. Subclavian artery occlusion is a rare cause of MI in patients with internal mammary grafting [10]. These have been managed with either a conservative or interventional approach. Spontaneous subclavian artery dissection associated with stroke has been described [12].

In contrast to the published cases, in our patient the dissection was not accompanied by a deterioration of the blood flow. Since the radial approach was employed, the origin of the dissection (from distal to proximal) probably favored its lack of progression, and the success of conservative management.

Some operators recommend left radial approach in old patients, which wasn't the case of our patient, to avoid this complication because of loops.

The operator should also be careful and do not force when advancing the wire or the guiding catheter.

CONCLUSION

Vascular complications during cardiac catheterization remain an important cause of morbidity in patients undergoing invasive procedures. The need for prompt recognition and appropriate management of vascular complications is mandatory to avoid severe handicap and to optimize outcomes in these fortunately uncommon situations. When the blood flow is maintained and there are no signs of arterial ischemia or neurological distress, conservative management may be an effective strategy.

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Dissection of the Coronary Sinus of Valsalva Complicating Percutaneous Coronary Intervention for Chronic Total Occlusion

Dissection du sinus de Valsalva compliquant une angioplastie coronaire percutanée d'une occlusion complète chronique

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Résumé

La dissection rétrograde du sinus de Valsalva pendant une angioplastie coronaire percutanée représente une complication relativement rare. Nous présentons le cas d'une dissection aortique iatrogène compliquant un acte d'angioplastie d'une occlusion coronaire chronique totale.

Mots-clés

Dissection ; sinus de Valsalva ; angioplastie coronaire percutané

Summary

Retrograde dissection extending into the sinus of Valsalva during percutaneous coronary intervention (PCI) is a relatively rare complication. We present a case of iatrogenic aortic dissection complicating PCI of chronic total occlusion coronary.

Keywords

Dissection; sinus of valsalva; complication; PCI

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INTRODUCTION

Retrograde dissection extending into the sinus of Valsalva is a very rare iatrogenic complication of percutaneous coronary intervention (PCI). The main danger of this event is the possibility of dissection extension to the ascending aorta.

We present a case of coronary artery dissection during PCI, extended retrogradely into the right sinus of Valsalva.

CASE REPORT

A 50-year-old man, current smoker with no other risk factors for cardiovascular disease, presenting with stable angina was admitted to our hospital for coronary angiography. Approximately 4 months before this admission, he presented an episode of prolonged chest pain.

Echocardiography showed an inferior wall hypokinesis with a left ventricle ejection fraction of 50%.

The angiogram found a three vessels disease with severe stenosis of the mid portion of the left anterior descending artery (LAD), a bifurcation lesion of the circumflex (CX)/ marginal artery and a proximal chronic total occlusion (CTO) of a dominant right coronary artery (RCA). STS Risk Score was 1.06% with a SYNTAX Score of 18. A recanalization of the chronic total occlusion of the RCA was planned.

The RCA was easily cannulated with a soft tipped 6-French Judkins Right 4 guiding catheter, then a 0.014 inch Pilot 50 guide wire was advanced in the vessel but failed to cross the occlusion. A contrast injection revealed a dissection of proximal RCA with anterograde extension to the distality and a staining contrast limited to the right sinus of Valsalva (Fig. 1).

The patient had presented a ventricular fibrillation

treated immediately with direct cardioversion. Given the absence of chest pain and the limited aortic involvement on the angiogram, the procedure was stopped.

Transthoracic echocardiography visualized only a limited dissection to the right sinus of Valsalva and no retrograde extension to the ascending aorta (Fig. 2, A).

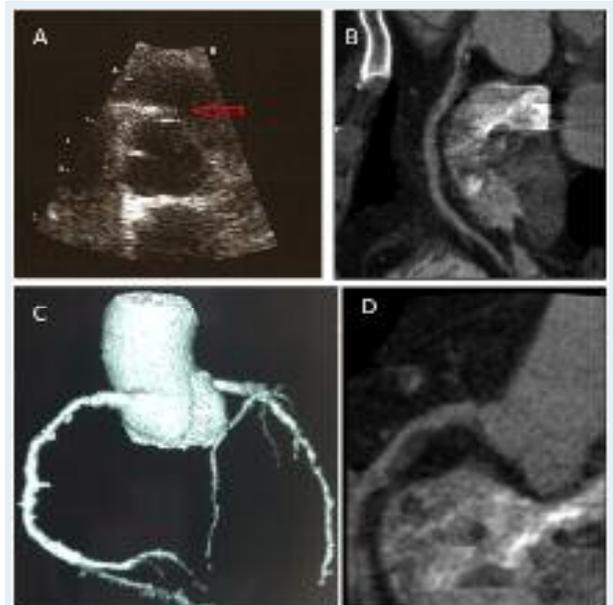


Figure 2 : A- a limited aortic dissection in Transthoracic echocardiography .

B,C,D- computed tomography showed regression of right sinus of Valsalva dissection and a persistence of a long dissection in the RCA .

The patient underwent cardiac computed tomography five days later showing partial regression of right sinus of Valsalva dissection and the persistence of dissection along RCA (Fig. 2).

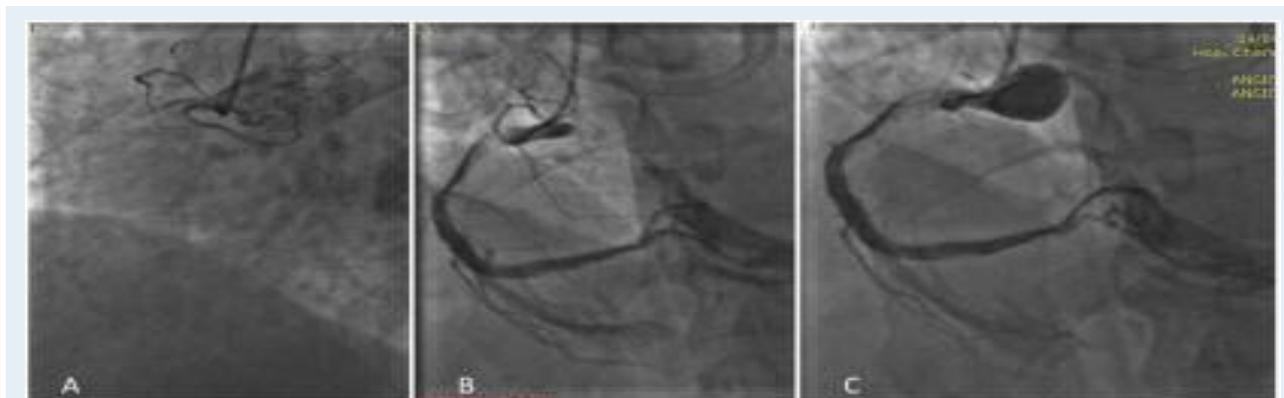


Figure 1 : A-Chronic total occlusion of the proximal right coronary artery (RCA).
B-Dissection of proximal RCA with anterograde extension to the distal RCA.
C-Contrast staining limited to the right sinus of Valsalva.

Coronary angiography was performed one month after discharge showing complete regression of aorta dissection but persistence of the false lumen in the mid and distal RCA (Fig.3). The patient finally underwent elective coronary artery bypass grafting.



Figure 3 : coronary angiography performed one month after discharge showed complete resolve of aorta dissection and persistence of very long coronary dissection in the RCA.

DISCUSSION

Retrograde dissection of the sinus of Valsalva during catheterization interventions is a rare complication. Its incidence varies between 0.06% and 0.15% for angioplasty procedures (1). Iatrogenic aortic dissection complicating percutaneous coronary intervention for chronic total occlusion is also rare. In a single-centre experience of 956 consecutive CTO procedures, Boukhris and al reported a prevalence of 0.83% (2). In a report of 43,143 cardiac catheterization and PCIs, only 9 cases of iatrogenic aortic dissections were reported with an incidence of 0.02% (3). Shorrock et al. (4) found a greater incidence of 1.8% in a single-centre experience of 336 consecutive CTO procedures. In fact, CTO patients have a more severe atherosclerotic disease leading to more complex procedures and a high frequencies of complications (5). The predisposing conditions include

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hypertension, bicuspid aortic valves, Marfan syndrome, and extensive atherosclerosis (2). Several mechanisms could be responsible for the occurrence of aortic dissection and its propagation: Vigorous Contrast injections could lead to progression of subintimal tear. The shearing forces due to blood flow may also account for the antegrade and retrograde propagation of the dissection.

Moreover, the dissection created by mechanical trauma (rigid wires, manipulation of the guiding catheter) or forceful injections of contrast medium into the subintimal zone, is exposed to the aortic flow leading to the subsequent extension of the intimal tear (6).

The management of dissection of the RCA involving the right sinus of Valsalva depends on both hemodynamic condition, the progression of aortic dissection, and the extension of coronary disease.

Surgery, PCI and conservative treatment are the main therapeutic strategies. Urgent surgical repair is the unique life saving treatment of severe extensive aortic dissection but stenting of the entry site could be suitable option for patients with limited dissection, thus avoiding a rapid spread of the dissection into the aorta and the need for an emergent surgery (4). Intravascular ultrasound might be very useful to access the entry site, dissection extension and the result after stenting (2).

Conservative strategy, with medical management until spontaneous healing of the sinus dissection represents an alternative solution for stable patients (7). However, even when the initial clinical presentation is apparently benign, progression of the dissection into the ascending aorta can occur suddenly. That's why serial assessments of the aortic dissection extension, using Transesophageal echocardiography or CT scan, should be performed. In our case, because of stability of the dissection, the absence of myocardial ischemia we opted for a "wait and see strategy".

CONCLUSION

Aortic dissection limited to one sinus of Valsalva is a rare complication during percutaneous coronary intervention. Vigorous contrast medium injections must be avoided in presence of coronary dissection. The therapeutic strategy depends on the degree of aortic dissection extension and the rapidity of its progression.

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