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Resolution of an Acute Aortic Syndrome with Aortic Valve Insufficiency Post-PCI

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABDEF **Pedro G.M. de Barros e Silva**
ABDEF **Thiago Aquino**
ABDC **Marcos V. Resende**
BC **Ivo Richter**
BCD **Cecilia M. Barros**
BCD **Vanessa G. Andrioli**
DEF **Antonio C. Baruzzi**
DEF **Caio C.J. Medeiros**
EFG **Valter Furlan**

Department of Clinical Research, Hospital Totalcor, Sao Paulo, Brazil

Corresponding Author: Pedro G.M. de Barros e Silva, e-mail: pgabriel@amil.com.br
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Patient: Female, 52
Final Diagnosis: Acute aortic syndrome with aortic valve insufficiency post-PCI
Symptoms: Chest pain
Medication: —
Clinical Procedure: Conservative
Specialty: Cardiology

Objective: Unusual or unexpected effect of treatment





Background: Acute aortic syndrome is the modern term that includes aortic dissection, intramural hematoma, and symptomatic aortic ulcer. Iatrogenic coronary artery dissection extending to the aorta during percutaneous coronary intervention is a very rare but life-threatening complication. Despite some reports of spontaneous recovery, most of these patients are treated surgically as a spontaneous aortic dissection, especially if there is a complication of the aortic lesion.

Case Report: A 52-year-old white female was submitted to an angioplasty in the right coronary without success and the procedure was complicated by a dissection in aortic root with progressive extension to the ascending aorta. This lesion deformed the aortic valve, leaving it with an acute moderate regurgitation. Because of current use of clopidogrel and clinical stability of the patient, the local Heart Team decided to withdraw this antiplatelet for 5 days before surgery despite the risk related to the aortic syndrome. A new echocardiogram 3 days later showed that the hematoma was reabsorbed with improvement of the aortic insufficiency. An angiotomography confirmed the reabsorption of the hematoma. The surgery was canceled and the patient was maintained in a conservative treatment and discharged. Seventeen months later, she was re-evaluated and was still asymptomatic without aortic regurgitation in the echocardiogram and showing progressive regression of the aortic hematoma in the tomography.

Conclusions: Despite the conservative treatment, this case of iatrogenic aortic dissection complicated by an acute aortic regurgitation had a good evolution in a follow-up of 17 months.

MeSH Keywords: Aorta • Dissection • Echocardiography

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/891301>

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Background

Dissection of the ascending aorta is a life-threatening condition and despite notable advances in percutaneous coronary intervention (PCI), there are rare cases of aortic dissection due to PCI (about 0.07%) [1], especially in the myocardial infarction scenario (0.19%) [2].

There are few cases of cardiac-catheter-induced aortic dissection reported in detail in the literature to date. Treatment options include urgent surgical intervention, placement of an intracoronary stent at the origin of the culprit vessel, or conservative therapy. Considering the small number of cases described in the literature to date, there is a lack of data to define consistent recommendations for management of this complication. Despite some favorable results of conservative approach, the current limited data suggest that surgical management may be indicated in cases of post-PCI ascending aortic dissection, especially if there is any complication related to the aortic lesion, like an acute aortic regurgitation [1–12]. Patients with limited dissections and successful stenting of the coronary dissection may not require surgery, but the very rare cases of extensive dissection with secondary complications are routinely treated by surgery. A good evolution after a conservative management in this scenario of acute aortic regurgitation due to aortic dissection is unexpected.

Case Report

A 52-year-old white female, with history of hypertension, dyslipidemia, and hypothyroidism, was hospitalized on 21 August 2012 due to non-ST elevation acute coronary syndrome. This patient did not have a history of smoking, alcohol abuse, or use of illegal drugs. She underwent coronary angiography on the same day and a severe stenosis in the ostium of the

right coronary was detected, but this vessel received distally a rich collateral circulation. Considering this lesion the cause of the symptoms, on 23 August it was decided to perform a percutaneous treatment of the diseased artery. The intervention was not successful and was complicated by an aortic root dissection with progressive intramural hematoma of the ascending aorta (Figure 1). The patient was then referred to our service on 24 August and transferred to the ICU, being assessed by the cardiac surgery team, which initially requested a transesophageal echocardiogram (TEE).

The first TEE showed aortic wall thickening with maximum thickness of 3 cm, limited to the posterior-lateral, with a growing characteristic aspect, affecting the right coronary cusp of the aortic valve and extending about 4 cm from the ascending aorta (Figure 2). No typical blade signs of rupture or dissection were detected. The valve presented moderate regurgitation secondary to an alteration of coaptation (Figure 2). Both aortic the arch and descending aorta were normal and no signs of pericardial effusion were detected. Initially, surgical treatment was suggested, probably Bentall de Bonno, considering the persistence of the tear site at the right coronary ostium, the extension up the ascending aorta, and the presence of acute aortic regurgitation.

Due to the recent use of clopidogrel and clinical stability of the patient after blood pressure and heart rate control, the intervention was postponed by a further 5 days, even considering this approach controversial in this clinical scenario.

During her stay in the ICU for the “washout” of clopidogrel, the patient remained hemodynamically stable, Glasgow coma scale of 15, with occasional mild chest pain without any clinical repercussion, comfortable respiration, with O₂catheters, full and symmetrical pulses in all 4 limbs; intravenous nitroglycerine in low doses and, prophylactic enoxaparin.

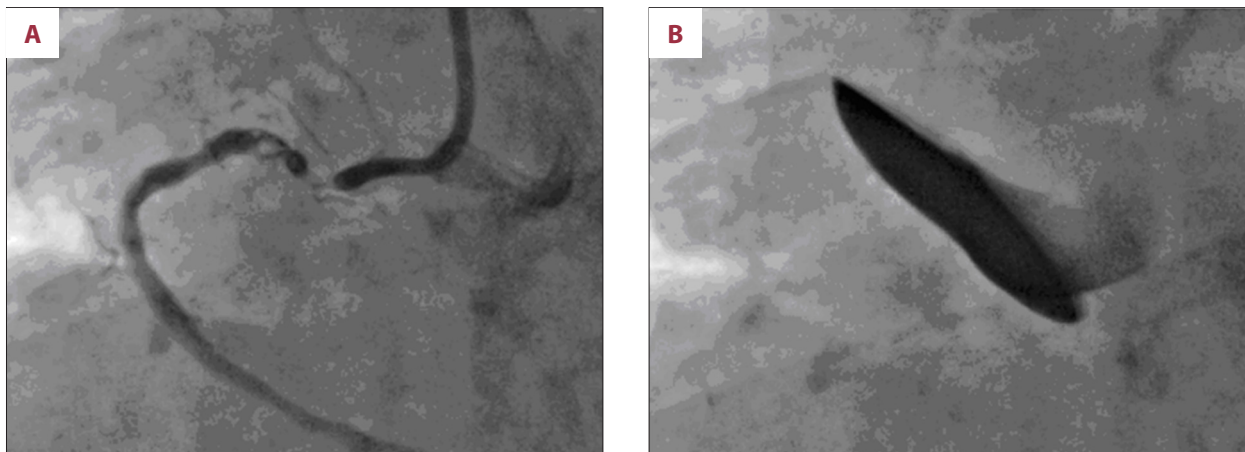


Figure 1. (A) image shows severe lesions in the right coronary ostium. (B) image shows a limited region with concentration of contrast in the ascending aorta.

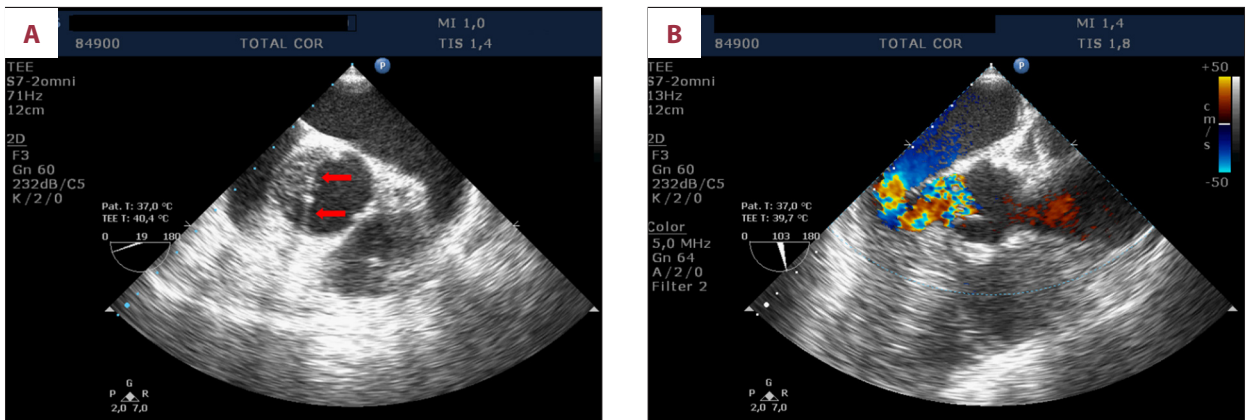


Figure 2. TEE cross-section of the aorta wall with arrows showing hematoma in the ascending aorta (A). (B) image shows the presence of aortic valve regurgitation by color Doppler.

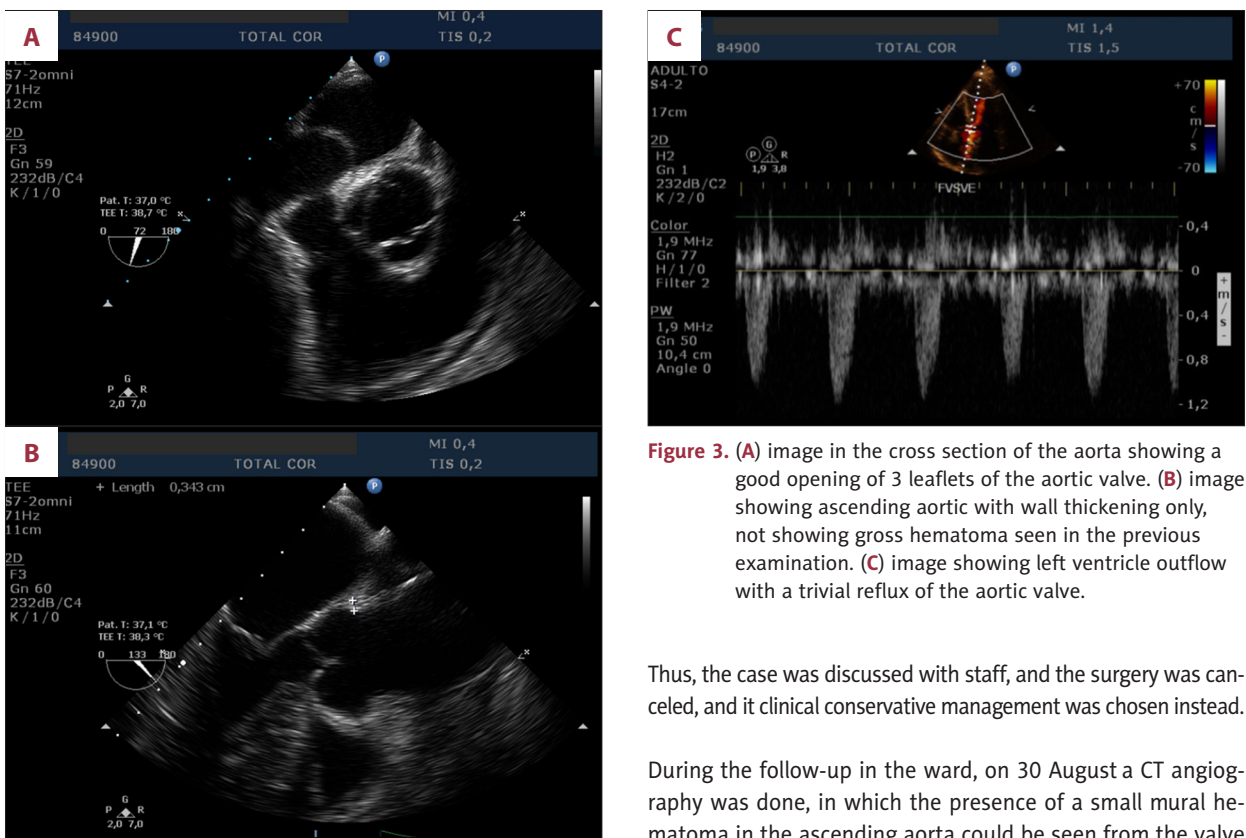


Figure 3. (A) image in the cross section of the aorta showing a good opening of 3 leaflets of the aortic valve. (B) image showing ascending aortic with wall thickening only, not showing gross hematoma seen in the previous examination. (C) image showing left ventricle outflow with a trivial reflux of the aortic valve.

Because of her satisfactory clinical evolution, on 27 August the transesophageal echocardiogram (pre-surgical) was repeated for a better treatment definition. We noted the absence of any suggestive image of dissection and/or significant hematoma in the proximal ascending aorta; there was only a thickening of the aortic wall (Figure 3). Also with the improvement in the competence of the aortic valve, only a trivial reflux was shown (Figure 3).

Thus, the case was discussed with staff, and the surgery was canceled, and it clinical conservative management was chosen instead.

During the follow-up in the ward, on 30 August a CT angiography was done, in which the presence of a small mural hematoma in the ascending aorta could be seen from the valve plane, preferentially located in the lateral right aorta, with a thickness of 7 mm and a slight pericardial effusion (Figure 4).

Having a significant resorption of the hematoma in the ascending aorta, taking into account the patient's good clinical evolution, and because the coronary artery receives a rich collateral network, the patient was discharged from hospital, with the recommendation of rest for 2 weeks and outpatient treatment. After 17 months, the patient did not have any relevant clinical event and imaging showed almost complete regression of the hematoma and no aortic regurgitation (Figures 5 and 6).

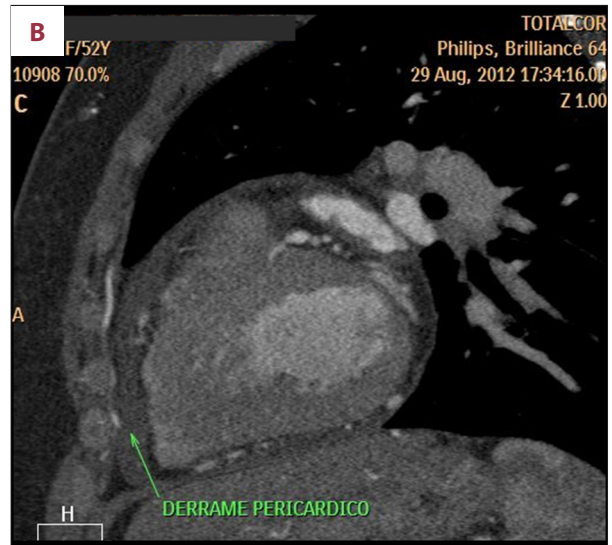


Figure 4. (A) image shows a small hematoma to the right side of the aorta. (B) image shows mild pericardial effusion.

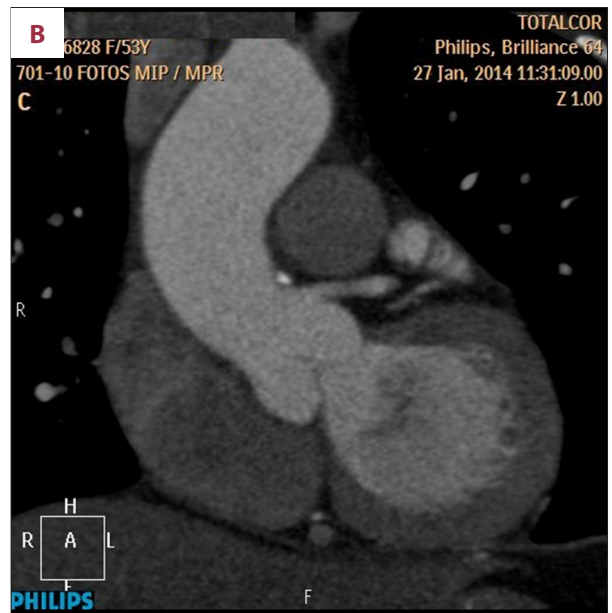
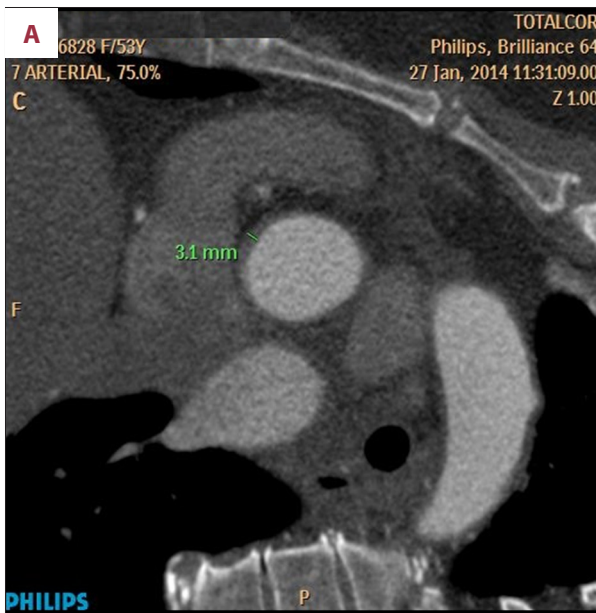


Figure 5. (A, B) CT performed 17 months after the event showing regression of the thickening of the aorta wall and no pericardial effusion.

Discussion

Acute aortic syndrome is the modern term that includes aortic dissection (AD), intramural hematoma (IMH), and symptomatic aortic ulcer [13,14]. Iatrogenic coronary artery dissection extending to the coronary sinuses during percutaneous coronary intervention occurs in less than 0.1% of cases [15,16]. In diagnostic imaging, it may appear as crescent-shaped or circumferential thickening around the aortic wall, and not as true and false lumens separated by an intimal “flap”, making the diagnosis between AD or IMH more difficult [14–16].

Stanford classification, very commonly used to aortic dissection, may be useful for aortic hematoma because both diseases have similar prognosis and therapeutic implications [13–19]. The lesions involving the ascending aorta are classified as type A, and the ones not present in the ascending aorta, as type B.

The proximal hematoma involving the ascending aorta appears to be an important predictor for early progression and death [13–18], representing a high risk of a non-surgical management of type A aortic syndromes. Among cases of post-PCI aortic dissections, the overall mortality seems to be a little lower than in spontaneous lesions, but the risk increases as complications occur.

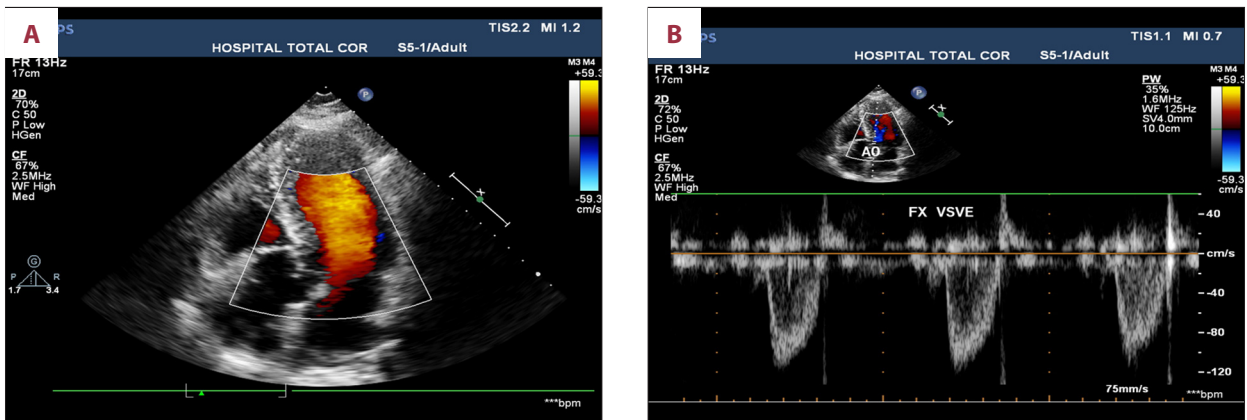


Figure 6. (A, B) Echocardiogram performed 17 months after the event, without signs of aortic valve insufficiency

Like the current case report, more than 80% of the reported cases have involved the right coronary artery as the culprit vessel [15,20]. It is possible that the larger ostium of the left main coronary artery may decrease the incidence of catheter-induced trauma to this vessel. The risk of this complication is higher in cases of extensive coronary disease (e.g., heavily calcified vessels or total occlusions) because these procedures usually require a more aggressive manipulation of catheters in vessels whose walls are less resistant to trauma. Despite some abnormalities in the wall of the aorta of cases of catheter-related dissection, the situation is different in patients who had spontaneous aortic dissection, who almost always have significant degeneration of the media, facilitating the propagation of the dissection [19]. The literature shows that iatrogenic aortic dissections have fewer complications than spontaneous disease [21].

Considering the differences between spontaneous and cardiac-catheter-related dissection of the ascending aorta in terms of pathophysiology and prognosis, the treatment management recommended may also have some unique aspects. The entry site also has therapeutic implications because a coronary-based dissection may be effectively sealed by stenting within minutes of this complication, limiting the potential for further propagation. Careful surveillance with optimal blood pressure control and appropriate imaging could be used to ensure stability and healing of the dissection. Serial transesophageal echocardiography studies certainly showed this in our patient.

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In this case report, considering the extension of the hematoma in the ascending aorta and aortic regurgitation, surgery was the most plausible decision initially chosen by the Heart Team.

There are few reports of cases describing an iatrogenic aortic lesion showing the possibility of resolution without surgery [7,8,21,22]. However, our case had a major complication, which was a clinically-relevant acute aortic regurgitation. This situation was considered potentially catastrophic if no surgery was performed, considering similar situations [23]. Based on this assumption, we chose to perform a surgical intervention; however, surprisingly, the lesion reverted in the following days and improved in the control exams after 17-month follow-up.

Conclusions

This unexpected effect of conservative treatment reveals the importance of establishing predictive factors for the evolution of iatrogenic aortic syndromes, aiming to make the best treatment decision for these rare and unpredictable cases.

Disclosures

I hereby declare that there are no potential or relevant conflicts of interest of any of the authors.

Acknowledgments

Amil Clinical Research.

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