





A series of unfortunate events: chronic total occlusion, haemopericardium, atrial fibrillation, and cerebral ischemic stroke. Is optimal management of anticoagulation therapy (in this case) possible?

Seria niefortunnych zdarzeń – przewlekła okluzja tętnicy wieńcowej, *hemopericardium*, migotanie przedsionków i udar niedokrwienny. Czy optymalna antykoagulacja jest (w tym przypadku) możliwa?

Agnieszka Dębska-Kozłowska , Izabela Warchoł , Marcin Książczyk ,
Andrzej Lubiński 

Department of Interventional Cardiology and Cardiac Arrhythmias, Medical University of Lodz, Łódź, Poland

Abstract

Successful chronic total occlusion (CTO) percutaneous coronary intervention (PCI) has been related to discordant benefits concerning clinical and quality life measures.

We present a patient previously diagnosed with hypertrophic cardiomyopathy with left ventricular outflow obstruction referred for a CTO of the left anterior descending artery PCI. Crossing via left anterior descending artery was complicated by perforation resulting in haemopericardium (no evidence of tamponade; the patient remained hemodynamically stable). On subsequent days the patient presented with two asymptomatic paroxysmal atrial fibrillation (AF) episodes (*de novo*). In this patient's case, the stroke's risk factors did not mandate anticoagulation due to haemopericardium and arrhythmia duration of < 48 hours. Twenty-six hours after the second AF episode, the patient suffered a large ischemic stroke in the territory supplied by the right middle cerebral artery. Despite mechanical thrombectomy (MT), the patient died.

Even though CTO PCI is an appealing choice in patients with complex coronary artery disease and chronic total occlusion, the risk still should not be underestimated. Another issue is assessing the thromboembolic risk associated with acute cardioversion of patients with AF estimated to be of < 48 hours duration – it is usually considered low. However, there is increasing evidence that short runs of AF confer a significant risk of stroke. Moreover, it was shown that, among patients undergoing MT for acute ischemic stroke, women had worse outcomes at 90 days.

Key words: anticoagulation, atrial fibrillation, chronic total occlusion, complex percutaneous coronary intervention, mechanical thrombectomy

Folia Cardiologica 2020; 15, 4: 320–322

Introduction

Successful chronic total occlusion (CTO) percutaneous coronary intervention (PCI) has been related to discordant benefits concerning both clinical and quality of life measures [1]. However, there is still a considerable risk associated with CTO PCI. Mehran et al. [2] found that coronary perforation, one of the major complications, was infrequent in their study population, occurring in 3.5% of cases. However, nothing is ever as simple as it seems to be. Nonetheless, we present a complicated case of an ischemic stroke precipitated by CTO PCI periprocedural perforation and subsequent atrial fibrillation (AF).

Case report

A 73-year-old female, with no prior history of AF, previously diagnosed with hypertrophic cardiomyopathy (HCM) with left ventricular outflow obstruction (resting pressure gradient 70 mm Hg, exercise-induced gradient 120 mm Hg) presenting with dyspnea on exertion was found to have a CTO of the left anterior descending (LAD) artery (Figure 1).

She was referred for PCI [she was not referred for coronary artery bypass grafting (CABG) and myomectomy on the grounds of lack of consent despite obvious indications]. Her history was also notable for hypertension and tobacco use. Crossing via LAD was attempted. However, the branch could not be crossed due to severe calcification, and perforation occurred. Subsequent dilatation with a balloon was performed to prevent the pericardial cavity from overfilling with blood. The patient remained hemodynamically stable. Anticoagulation was reversed with protamine, and final angiography demonstrated no further extravasation. Several transthoracic echocardiograms performed during an hour revealed 21 mm of pericardial separation (6 mm of free fluid). Due to hemodynamic stability, the patient did not require further interventions. Repeat echocardiography the following day did not demonstrate subsequent fluid accumulation.

A day after the CTO PCI attempt, the patient presented with an episode of AF denying chest pain and dyspnea, which had been converted with amiodarone. Three days after the procedure, another asymptomatic episode of AF had been converted, similarly. Concerning anticoagulation,

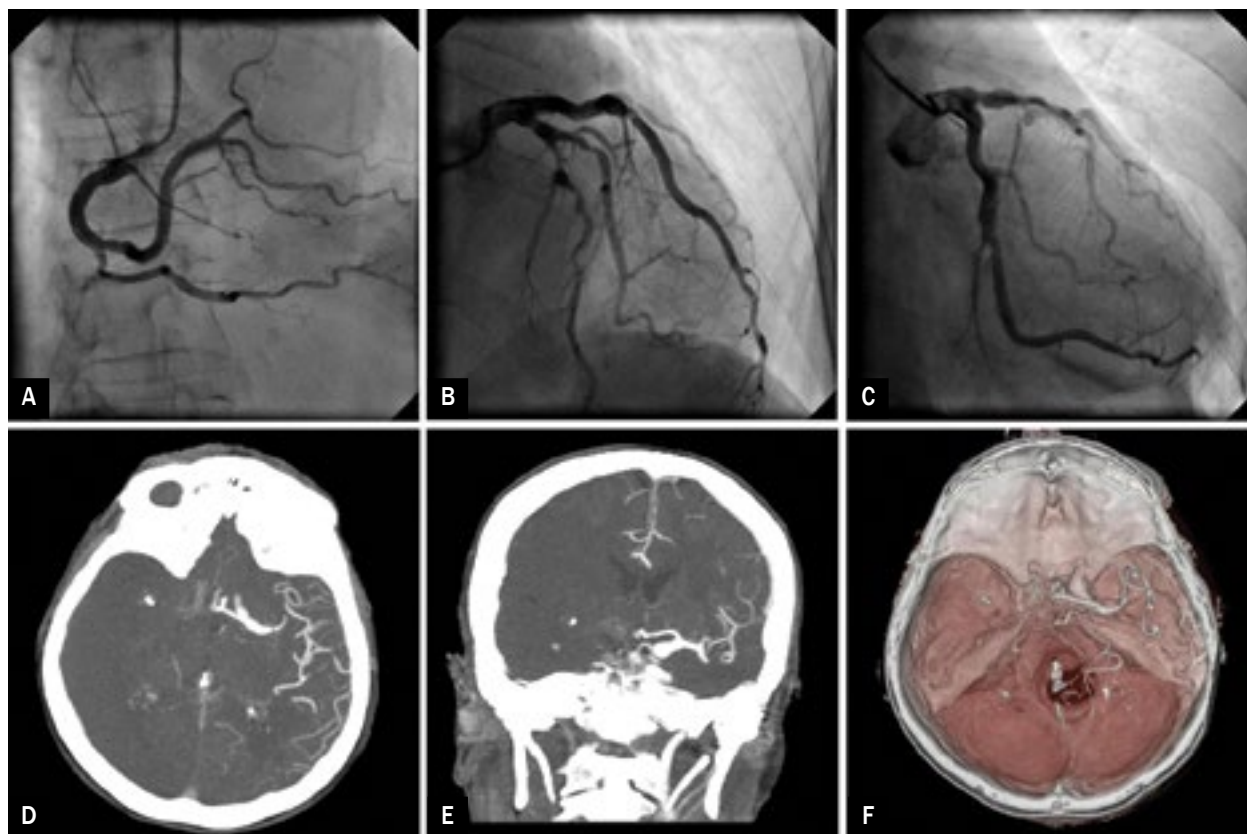


Figure 1A. Right coronary artery; **B, C.** Chronic total occlusion of left anterior descending coronary artery; **D.-F.** Right intracerebral artery occlusion – transverse, frontal views, three-dimensional (3-D) angiography computed tomography (angio-CT) reconstruction

heparin is the preferred agent for initial anticoagulation because it provides almost immediate effects and can be discontinued rapidly if bleeding complications arise; however, it should not be used in patients with signs of active bleeding. In this patient's case, the risk factors for stroke, including sex, age, and hypertension, together did not mandate anticoagulation due to earlier perforation. Moreover, the AF duration was less than 48 hours.

Twenty-six hours after the second AF episode, the patient suffered a sizeable ischemic stroke in the territory supplied by the right middle cerebral artery. The neurological deficit was significant (left hemiparesis, left facial droop, impaired consciousness). Subsequently, computed tomography angiogram showed a right internal carotid artery occlusion (Figure 1). Computed tomography perfusion revealed a mismatch with large penumbra (Figure 1). Consequently, the patient was taken for mechanical thrombectomy

(MT) due to earlier PCI complication and anticoagulation contraindications. Eventually, on subsequent days after MT, the patient died.

Conclusion

The potential benefits should be weighed against the risks in the treatment of patients presenting with AF that is estimated to be of < 48 hours duration.

Acknowledgments

None.

Conflict of interest

The authors declare no conflict of interest.

Streszczenie

Korzyści i ryzyko związane z procedurą skutecznej rewaskularyzacji przewlekle zamkniętej tętnicy wieńcowej (CTO) pozostają nieokreślone.

Przedstawiony przypadek kliniczny dotyczy pacjentki z wywiadem kardiomiopatii przerostowej z zawężeniem drogi odpływu lewej komory, z przewleklą okluzją gałęzi przedniej zstępującej (LAD) zakwalifikowaną do zabiegu rewaskularyzacji przezskórnej. Procedura otwarcia CTO LAD była powikłana perforacją naczynia z wysiękiem krwi do osierdzia (bez cech tamponady; pacjentka pozostawała stabilna hemodynamicznie). Po zabiegu obserwowano 2 epizody bezobjawowego migotania przedsionków (arytmia *de novo*). W tym przypadku uznano, że ryzyko zakrzepowo-zatorowe nie usprawiedliwiało zastosowania antykoagulacji ze względu na *haemopericardium* i czas trwania arytmii krótszy niż 48 godzin. Dwadzieścia sześć godzin po drugim epizodzie migotania przedsionków u pacjentki wystąpił rozległy udar niedokrwienny w obszarze ukrwionym przez prawą tętnicę środkową mózgu. Pomimo zastosowanej trombektomii mechanicznej chora zmarła.

Rewaskularyzacja przezskórna przewleklej okluzji tętnicy wieńcowej jest godną rozważenia opcją terapeutyczną w wybranej grupie chorych, jednakże ryzyko zabiegu nie powinno być lekceważone. Odrębnym zagadnieniem jest trudność w ocenie ryzyka zakrzepowo-zatorowego związanego z kardiowersją migotania przedsionków trwającego poniżej 48 godzin – zwykle to ryzyko jest określane jako niskie. Jakkolwiek coraz więcej dowodów wskazuje na fakt, że nawet krótkie epizody migotania przedsionków mogą się wiązać z konkretnym ryzykiem udaru. Co więcej, wśród pacjentów zakwalifikowanych do mechanicznej trombektomii kobiety mają gorsze, 90-dniowe rokowanie.

Słowa kluczowe: antykoagulacja, migotanie przedsionków, przewlekle okluzja tętnicy wieńcowej, złożona rewaskularyzacja wieńcowa, trombektomia mechaniczna

Folia Cardiologica 2020; 15, 4: 320–322

References

1. Fefer P, Knudtson ML, Cheema AN, et al. Current perspectives on coronary chronic total occlusions: the Canadian Multicenter Chronic Total Occlusions Registry. *J Am Coll Cardiol*. 2012; 59(11): 991–997, doi: [10.1016/j.jacc.2011.12.007](https://doi.org/10.1016/j.jacc.2011.12.007), indexed in Pubmed: 22402070.
2. Mehran R, Claessen B, Godino C, et al. Long-term outcome of percutaneous coronary intervention for chronic total occlusions. *JACC Cardiovasc Interv*. 2011; 4(9): 952–961, doi: [10.1016/j.jcin.2011.03.021](https://doi.org/10.1016/j.jcin.2011.03.021).