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## **Cardiac tamponade on 7th day after PCI - distant complication revealed by pharmacotherapy**

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**Cardiac tamponade on 7<sup>th</sup> day after PCI: distant complication revealed by  
pharmacotherapy**

Tamponada osierdzia w 7. dobie po PCI — odległe powikłanie ujawnione farmakoterapią

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**ABSTRACT**

A 61-year-old man with a history of percutaneous coronary intervention (PCI) was admitted due to typical stenocardial symptoms of unstable angina pectoris.

The first coronary angiography showed a 99% stenosis in the diagonal artery (DgII) and marginal restenosis in the right coronary artery (RCA). A PCI of Dg1 was performed. A few hours later, a chest pain accompanied with an increase in myocardial damage markers and ECG features of an inferior wall ST-elevation myocardial infarction (STEMI) were reported.

The second coronary angiography showed a significant (70%) restenosis in the RCA — balloon angioplasty was performed without complications. The next day, the patient had an episode of atrial fibrillation. Direct oral anticoagulant inhibitor was added to the current dual antiplatelet therapy. Spontaneous conversion to sinus rhythm was observed within approximately 48 hours.

On the 7<sup>th</sup> day, transthoracic echocardiogram revealed a large amount of fluid (25 millimeters near the apex) and signs of tamponade of the pericardial sac. In the third coronary angiography, a perforation in the distal segment of the DgII was observed and sealed using the snipped distal end of the balloon. On the 8th day of hospitalization, despite intensive treatment, the patient died.

This case demonstrates that cardiac tamponade can occur exceptionally late, 7 days after the PCI procedure and such a late presentation may lead to a fatal consequences.

Keywords: cardiac tamponade, coronary artery perforation, coronarography

A 61-year-old male with a history of percutaneous coronary intervention (PCI) was admitted due to typical stenocardial symptoms of unstable angina pectoris.

Patient's parameters did not deviate from the norm and no abnormalities were found on the electrocardiogram (ECG). The transthoracic echocardiogram revealed segmental contractility disorders in the apical and near-apical segments and preserved ejection fraction. The first coronary angiography showed a 99% stenosis in the diagonal artery (DgII) (Figure 1A1) and marginal restenosis in the right coronary artery (RCA). A PCI of Dg1 was performed. (Figure 1A2). A few hours later, a chest pain accompanied with an increase in myocardial damage markers and ECG features of an inferior wall ST-elevation myocardial infarction (STEMI) were reported. The second coronary angiography showed a significant (70%) restenosis in the RCA — balloon angioplasty was performed. The follow-up angiography showed no signs of perforation of the left coronary artery (LCA) (Figure 1B). The next day (4<sup>th</sup> day of hospitalization), the patient had an episode of atrial fibrillation. Rivaroxaban, a direct oral anticoagulant inhibitor (DOAC), was added to the current dual antiplatelet therapy (DAPT; acetylsalicylic acid + clopidogrel). Spontaneous conversion to sinus rhythm was observed within approximately 48 hours.

On the 7<sup>th</sup> day, the patient lost consciousness 3 times. Transthoracic echocardiogram revealed a large amount of fluid (25 millimeters near the apex) and signs of tamponade of the pericardial sac. In the third coronary angiography (Figure 1C) a perforation in the distal segment of the DgII was observed and sealed using the snipped distal end of the balloon. Pericardiocentesis was performed and approximately 500 milliliters of bloody fluid was drained. On the 8<sup>th</sup> day of hospitalization, despite intensive treatment, the patient died from multiple organ dysfunction syndrome.

Cardiac tamponade is an uncommon and life-threatening complication of PCI procedures, occurring with a frequency of less than 0.5% [1, 2]. The most common cause is distal perforation of the vessel, usually resulting from damage by the catheter tip (distal wire perforation [DWP], 37%). However, cardiac tamponade occurs only in 1 out of 5 cases of DWP [2]. Tamponade typically develops relatively quickly after coronary angiography, ranging from several minutes to several hours, and the perforation is usually visible during the procedure [1]. Perforations induced by guidewires often lead to slow blood outflow into the pericardial sac, eventually leading to the development of tamponade, generally within 3 days after the procedure [3]. Our case demonstrates that tamponade can occur exceptionally late, 7

days after the PCI procedure. The perforation likely occurred during the first coronary angiography and was likely patched with a thrombus. The treatment implemented DAPT and DOAC, caused clot dissolution and a slow but gradual accumulation of fluid in the pericardial sac (Ellis Classification type II) [4] in the subsequent days. The use of the snipped distal end of the balloon method is effective for distal cardiac perforations [5]. However, in this case, due to the delayed presentation (7<sup>th</sup> day since the procedure) and delayed diagnosis as well, the consequences were fatal.

## **Article information and declarations**

### **Ethics statement**

None.

### **Author contributions**

None.

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None.

### **Conflict of interest**

None declared.

### **Supplementary material**

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## **Streszczenie**

Sześćdziesięcioletni mężczyzna, po dwóch zabiegach przezskórnej interwencji wieńcowej (PCI) kilka lat wcześniej został przyjęty do kliniki z powodu bólu w klace piersiowej w obrazie ostrego zespołu wieńcowego — niestabilnej dławicy piersiowej.

Wykonano zabieg PCI zwężonej w 99% tętnicy diagonalnej II i jednocześnie angioplastykę wieńcową z implantacją stentu.

Dzień po zabiegu pacjent zgłaszał ból stenokardialny. Potwierdzono zawał serca z uniesieniem odcinka ST ściany dolnej oraz zakwalifikowano do ponownej koronarografii, podczas której uwidoczniło się w prawej tętnicy wieńcowej restenozę 70% w stencie — wykonano angioplastykę balonową, uzyskując pełne poszerzenie zmiany.

W kolejnej dobie zarejestrowano napad migotania przedsionków i wdrożono leczenie przeciwwkrzepliwie — w ciągu 48 godzin zaobserwowano samoistną konwersję do rytmu

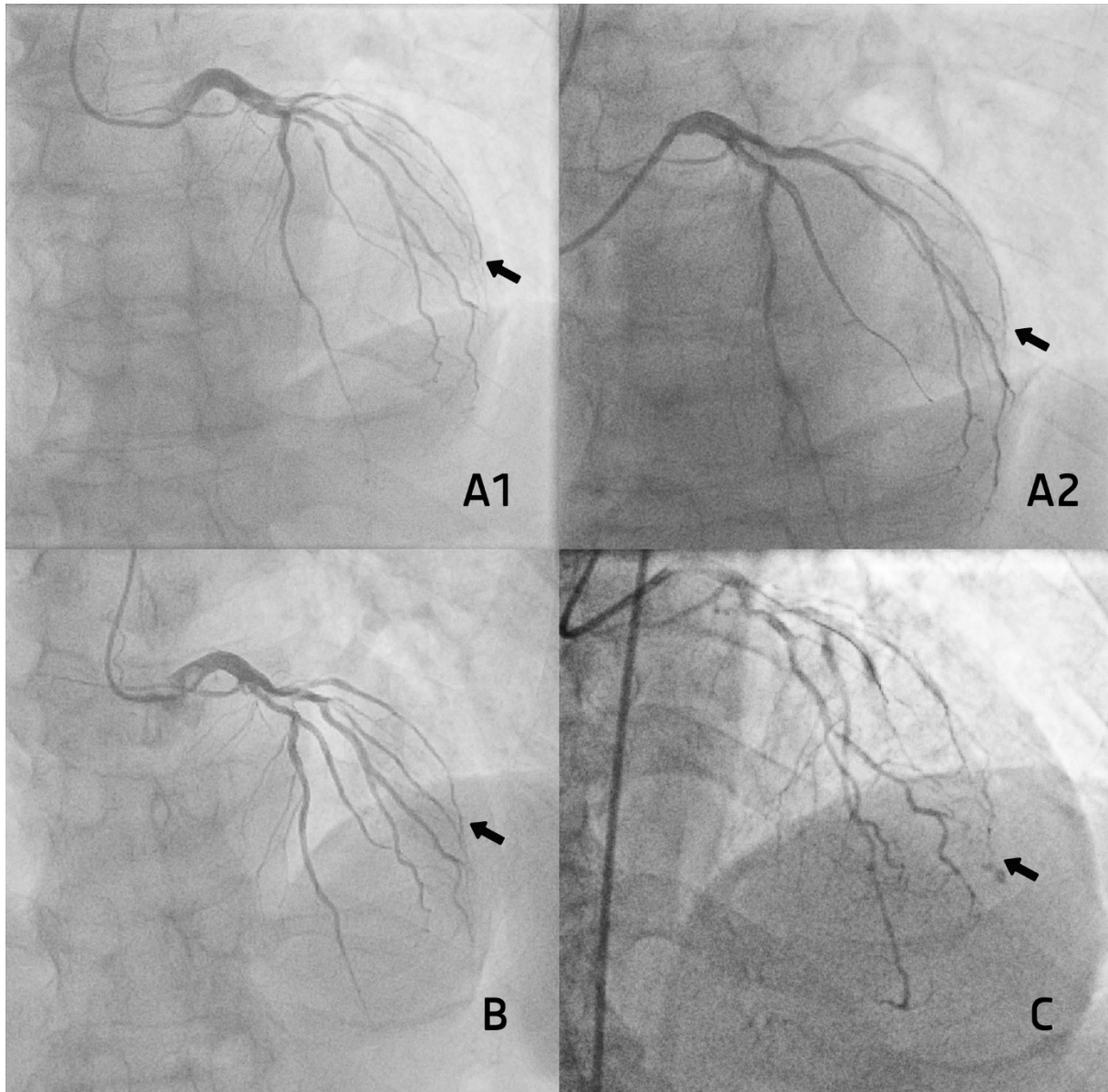
zatokowego. W 7. dobie u pacjenta doszło do kilkakrotnych omdleń. W badaniu echokardiograficznym wykryto płyn w worku osierdziowym z cechami tamponady. W kontrolnej koronarografii uwidoczniono perforację w tętnicy diagonalnej z widocznym przeciekiem kontrastu do worka osierdziowego. Skutecznie zamknięto ubytek oraz przeprowadzono perikardiocentezę. Pomimo odbarczenia płynu i pozostawienia drenu, dobę od perikardiocentezy, pacjent zmarł.

Perforacja naczynia wieńcowego jest rzadkim powikłaniem koronarografii występującym zwykle do 3. doby po zabiegu. W opisanym przypadku powikłanie ujawniło się wyjątkowo późno prowadząc w konsekwencji do fatalnych skutków.

Słowa kluczowe: tamponada osierdzia, perforacja naczynia wieńcowego, koronarografia

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**Figure 1.** **A1.** 2<sup>nd</sup> day of hospitalization — coronary angiography (ACS-UA) — qualification for simultaneous PCI DgII; **A2.** 2<sup>nd</sup> day of hospitalization — control graphy immediately after PCI II Dg — no features of vessel perforation; **B.** 3<sup>rd</sup> day of hospitalization — second coronary angiography (inferior wall STEMI) — control LCA graphy — no signs of vessel perforation; **C.** 7<sup>th</sup> day of hospitalization — coronary angiography after diagnosing tamponade, just before pericardiocentesis; visible perforation of the DgII; ACS — acute coronary syndrome; DgII — second diagonal artery; LCA — left coronary artery; PCI — percutaneous coronary intervention; RCA — right coronary artery; STEMI — ST-elevation myocardial infarction; UA — unstable angina