Iatrogenic pulmonary embolism with cyanoacrylate — to remove, or to leave?

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A 46-year-old female with autoimmune hepatitis and liver cirrhosis presented with the symptoms of upper gastrointestinal bleeding. Gastroduodenoscopy revealed active hemorrhage from a huge duodenal varix and endoscopic injection sclerotherapy with cyanoacrylate was performed. Since the bleeding continued, the patient underwent a successful surgical ligation of bleeding varix the following day.

Twenty days later the patient was re-admitted due to dyspnea, cough and pleuritic chest pain. On physical examination, she was tachypneic and hypoxic. Computed tomography angiography revealed the presence of disseminated, hyperdense deposits in segmental and subsegmental branches of both pulmonary arteries (Figure 1A; Supplementary material, *Video S1*), confirming the previously suspected diagnosis of pulmonary embolism (PE) with cyanoacrylate. A single-photon-emission computed tomography revealed bilateral wedge-shaped perfusion defects matching several bronchopulmonary segments of both lungs (Figure 1B; Supplementary material, *Video S2*). Echocardiography showed no embolic material in heart chambers and no features of right ventricle overload (TAPSE, 22 mm), yet pericardial effusion (Figure 1C–D). The cardiac troponin I and natriuretic peptide concentrations were within the reference range .

In contact with blood, cyanoacrylate undergoes rapid polymerization. Large varix size and injected volume increase the risk of embolization via the varix efferent vein into the inferior vena cava, right heart chambers and pulmonary arteries. The nature of PE with cyanoacrylate rules out any form of pharmacological therapy, including anticoagulation. The range of surgical treatment options is wide but choosing an optimal therapy for an individual patient is truly challenging [1]. Hitherto, no consensus regarding the best way of clinical management of iatrogenic cyanoacrylate emboli has been established [2]. For this patient, the accurate management of the PE episode was crucial since it could impact her overall condition and potentially disqualify her from liver transplantation. To facilitate immediate decision making by experts, she was consulted by the local Pulmonary Embolism Response Team (PERT) [3].

Given the hemodynamic stability, the patient was at low risk of death. The danger of further thromboembolic and septic complications was also identified as unlikely. Consequently, PERT members assessed the risk of interventional therapy to be higher than the risk of death. A decision was made to continue with the conservative therapy, which was followed by a control computed tomography angiography a month after the episode and a series of endoscopies with varices ligation every 2 months, without further complications. A favourable outcome during the 12-month follow-up period confirmed that the right path of management had been taken.

This report highlights the challenges in the management of iatrogenic PE. Recently, an interesting case of acute PE and right atrial thrombus was presented, which was due to central venous access chemotherapy port migration and required surgical excision [4]. In contrast, our patient did not undergo interventional treatment, but only a 12-month follow-up assured us of the patient's recuperation. Hence, in every patient, the treatment should be based on the individualized risk stratification to determine whether the interventional or conservative approach is more beneficial. Consultation in a multidisciplinary team is an important part

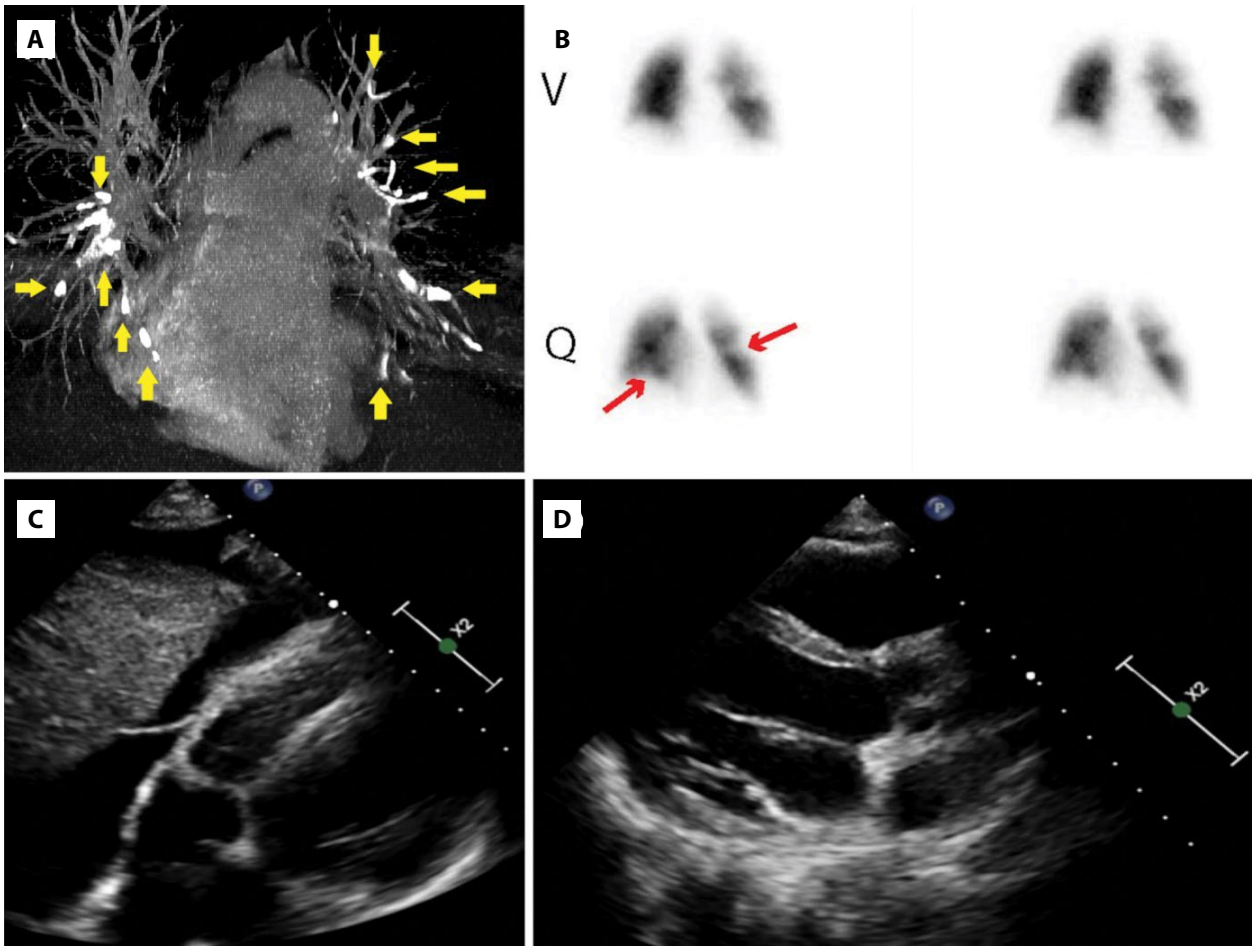

Figure 1. A. Coronal maximum intensity projection showing disseminated, hyperdense cyanoacrylate deposits within the segmental and subsegmental branches of pulmonary arteries to the middle and lower lobe in the right lung and the upper and lower lobe in the left lung (yellow arrows); there are no residual deposits visible within the right heart. **B.** Ventilation (V) and perfusion (Q) single-photon-emission computed tomography slices with multiple mismatched defects in the right and left lung (red arrows). **C, D.** Echocardiography showing no embolic material in the heart chambers and no features of right ventricular pressure overload

of the decision-making process to ensure optimal clinical management [5].

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

Article information

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