4D *strain* u dijagnostici plućne embolije: prikaz slučaja

4D strain in pulmonary embolism diagnostics: a case report

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Uvod: Dijagnozu plućne embolije s ili bez plućne hipertenzije često je teško postaviti bez primjene radioizotopne perfuzije pluća ili pulmonalne arteriografije.[1,2] Naime, bez plućnog infarkta, nalaz rendgena pluća bit će uredan.

Prikaz slučaja: 78-godišnji bolesnik je višegodišnji hipertoničar. U rujnu 2016. hospitaliziran je zbog tromboze poplitealne i fibularne vene desne noge. Tada se na RTG snimci pluća uoči manja količina pleuralnog izljeva desno. Na RTG pluća u prosincu 2016. na RTG-u pluća bez zastojnih promjena, pokoja trakasta fibrozna sjena bazalno. Color Doppler vena u veljači 2017. bio je uredan, nakon čega mu je antikoagulantna terapija prekinuta (potaknuto hematurijom). Na pregled se javlja u rujnu 2017. zbog neregulirane hipertenzije i stenokardije. Na učinjenom 12-kanalnom EKG-u nađe se sinus ritam 59/min, lijevi stražnji hemiblok. Na prvom 2D ehokardiografskom pregledu nađe se: početna ekscentrična hipertrofija lijeve klijetke uz urednu ejekcijsku frakciju, dijastolička disfunkcija I. stupnja, uvećan lijevi atrij i dilatirana aorta supravalvularno, umjerena mitralna i trikuspidna regurgitacija uz sistolnu plućnu hipertenziju (PAPS 60 mmHg) te manji izljev u perikardu. Nakon što je terapija korigirana, za tjedan dana učini se 4D UZV srca (*Tomtec 4D RV-function*), kada se dodatno nađe lagano proširena desna klijetka smanjene ejekcijske frakcije (19,92%) i izrazito smanjena longitudinalna deformacija slobodnog zida (-11,29%) i septuma DV (-6,97%) uz urednu ejekcijsku frakciju lijeve klijetke (**Figure 1**). Nakon primijenjene terapije došlo do regresije plućne hipertenzije i perikardijalnog izljeva. Kontrolni RTG pluća: frenikokostalni sinusi

Introduction: It is often difficult to diagnose a pulmonary embolism, with or without pulmonary hypertension, without application of a lung perfusion scan or pulmonary arteriography.[1,2] Namely, without pulmonary infarction, the findings of chest X-ray (CXR) will be normal.

Case report: 78-year-old patient has had hypertension for several years. In September 2016, he was hospitalized for thrombosis in the popliteal and fibular veins of his right leg. CXR in December 2016: no signs of heart failure, rare linear fibrous opacifications in the lower zone. Color Doppler of the veins (February 2017) was normal, after which the anticoagulant therapy was suspended (due to hematuria). In September 2017, he came because of the resistant hypertension and chest pain. The 12-lead ECG recorded the sinus rhythm 59/min, left posterior hemiblock. The first 2D echocardiography showed: initial eccentric left ventricular hypertrophy with normal ejection fraction; Grade 1 diastolic dysfunction; left atrial enlargement and dilated ascending aorta; moderate mitral and tricuspid regurgitation with systolic pulmonary hypertension (PAPS 60mmHg), and minor pericardial effusion. After therapy correction, the 4D ultrasound (Tomtec 4D RV-function) subsequently found a mildly dilated right ventricle of reduced ejection fraction (19.92%) and prominently reduced longitudinal deformation of the right ventricular free wall (-11.29%), and septum (-6.97%) with normal left ventricular ejection fraction (**Figure 1**). After the applied therapy, there was a regression of pulmonary hypertension and pericardial effusion. Follow-up CXR: phrenicocostal sinus bilaterally discreetly shallower with minimum quantity

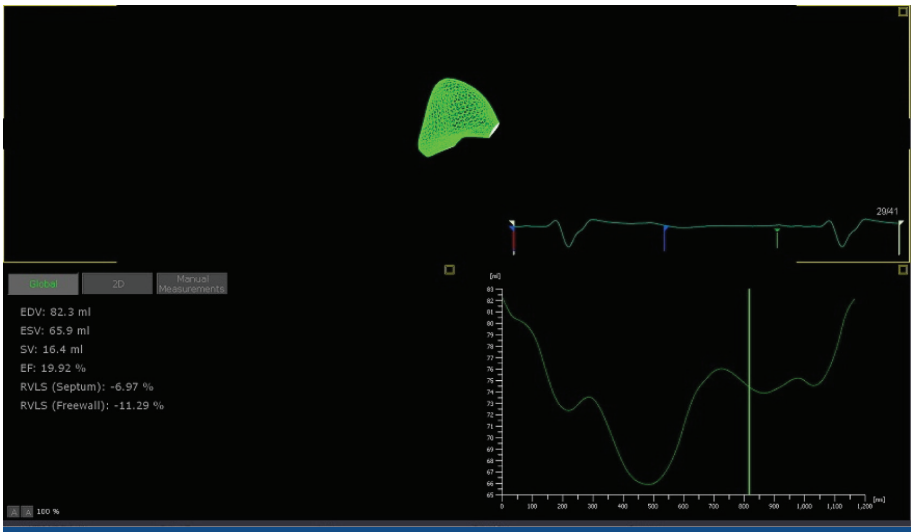

FIGURE 1. 4D right ventricular systolic function and longitudinal deformation image.

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obostrano diskretno plići, uz minimalnu količinu izljeva te naznačen mali interlobij. MSCT toraksa po protokolu za detekciju plućnog embolizma: parcijalni i potpuni defekti punjenja kontrastnog sredstva koji odgovaraju tromboembolusima u lumenu pojedinih segmentalnih i subsegmentalnih ogranaka plućnih arterija za gornji desni, srednji, lingulu i donji lijevi plućni režanj. Odmah je započeta terapija niskomolekularnim heparinom te antagonistima vitamina K.

Zaključak: Diferencijalna dijagnoza plućne embolije (mikroembolije) je ponekad vrlo zahtjevna osobito kod bolesnika s nejasnom kliničkom slikom. Zbog pravodobnog uvođenja adekvatne terapije, nužno ju je rano prepoznati, čemu pridonosi određivanje 4D longitudinalne deformacije septuma i slobodne stijenke DV i ejekcijske frakcije DV.

of effusion and defined small interlobar space. MSCT of the thorax according to the protocol for the detection of pulmonary embolism: partial and full contrast medium filling defects corresponding to blood clots in the lumen of individual segmental or sub-segmental branches of pulmonary arteries for the upper right, medial, lingual, and lower left lung lobe. Treatment with low-molecular-weight heparin and vitamin K antagonists was started immediately.

Conclusion: Differential diagnosis of pulmonary embolism (microembolism) is sometimes very demanding, particularly so in patients with unclear clinical manifestations. To start a timely and adequate treatment, it is essential to recognize the disease early, and 4D determination of longitudinal deformation of the septum and the right ventricular free wall and ejection fraction contributes to it.

LITERATURE

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