

**From kidney to kidney: an unusual case of paradoxical embolism through a patent foramen ovale in the course of a massive pulmonary embolism**

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**Introduction:** The presence of patent foramen ovale (PFO) has been linked to many illness, including cryptogenic stroke, transient ischemic attack and systemic embolization. In this context pulmonary embolism (PE) has been previously described as a favoring condition due to the resulting acute pulmonary hypertension.

**Case presentation:** A 59 years old healthy male presented to the Emergency Room with worsening dyspnoea (NYHA class III) since 2 months. ECG showed sinus tachycardia, pulmonary P waves and ST depression in precordial leads (Panel A). Room air oxygen saturation was 88%. Blood sample showed mild renal impairment, increased level of troponin and BNP.

A contrast-enhanced computed tomography (CT) highlighted bilateral massive PE with a huge override thrombus at the pulmonary artery bifurcation (B), bilateral renal ischemic lesions (C) and a right kidney mass suspected for malignancy (D). A transthoracic echocardiogram showed severe dilatation of the right ventricle with pulmonary hypertension (PAPs 70mmHg). After intravenous agitated saline contrast injection a moderate interatrial right-to-left shunt was demonstrated. Lower and upper limbs compressive ultrasonography (CUS) showed no evidence of deep venous thrombosis. Patient was successfully treated with i.v. heparin during the first 72 hours followed by long term direct oral anticoagulants (DOACs – Apixaban 5mg b.d.). At 6 months follow-up he is asymptomatic (NYHA class I) with no recurrence of embolism and a CT scan showed an almost complete resolution of previous PE.

**Discussion and conclusions:** Coexistence of PE and systemic embolism should always suggests the presence of paradoxical embolism. Under normal physiological conditions PFO allows a small amount of L-R shunt without no significant hemodynamic changes. However, in the setting of increased right atrial pressure, significant right to left shunt can occur and lead to paradoxical embolism. In this case the only detectable cause of embolism is a renal mass, suspected for malignancy, leading to a peculiar "thrombus route" through the pulmonary artery, the PFO and finally again to the kidneys.

**In conclusion** our case suggests that an abrupt increase in PAPs due to paraneoplastic PE created a paradoxical embolization to the kidneys through an otherwise silent PFO.

