

Percutaneous closure of traumatic atrial septal defect, where the problem lies?

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Introduction: We report the unique case of a man, who sustained violent blunt chest trauma resulting in cardiac septal defect (ASD), followed by paradoxical cerebral fat embolism. We also describe the challenging percutaneous closure of traumatic ASD.

Case report: A 21-year-old male was involved in a high-speed motor vehicle accident. Vital signs were: BP 115/90 mmHg; HR120 bpm; PO2 84%. X-ray: ribs and sternum fractures, and a displaced right femoral shaft fracture. Lab tests: leucocytosis (30540/mm³), CPK 871 U/L, CK-MB 8.7 mcg/L, Hs Troponin T 107 ng/L. EKG: sinus tachycardia. Three hours later, the patient underwent right femoral fracture nailing. On 2nd day, he showed psychomotor agitation and spread cutaneous petechiae. Brain CT scan revealed multiple bilateral hypodense spots of the white matter. Fat embolism syndrome (FES) with paradoxical cerebral involvement was suspected. 2D TEE showed the presence of 8 mm large atrial septal defect (ASD), with left-to-right shunt, of probably traumatic origin. The patient underwent urgent ASD percutaneous closure with 13 mm occluder device. The next day, routine 2D-TTE revealed device embolization and 2D-TEE showed a larger ASD (diameter shifted from 8 to 18 mm) with oedematous borders and significant left-to-right shunt. CT scan revealed device migration at infra-diaphragmatic aorta. Through left groin access, the device was successfully removed using a Goose-neck catheter and inferior vena cava filter was positioned. On 7th day from admission, new ASD percutaneous closure was performed, using a balloon sizing catheter, a 22 mm occluder device was deployed without any residual shunt. The patient was discharged on day 23 rd.

Discussion: Although uncommon, cardiac septal defects are known complications of blunt chest trauma. In our patient FES, due to femoral shaft nail fixation, unmasked a new born ASD previously excluded. Urgent percutaneous ASD closure resulted in device embolization due to progressive ASD enlargement maybe because traumatic ASD is surrounded by necrotic and friable tissue that may not hold an occluder device. From these data, we conclude that percutaneous closure of traumatic ASD is a feasible procedure, but it should be avoided in the acute phase after trauma due to the high risk of device embolization.

