G55 Death Due to Atrial Septum Defect Repaired by Transcatheter Closure: Who Failed?

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After attending this presentation, attendees will learn about the role of the forensic pathologist in transcatheter procedures and professional liability.

This presentation will impact the forensic science community by showing a case report regarding a bronchial lesion following transcatheter procedure.

A 13-year-old Caucasian male, with past medical history of ostium secundum atrial septal defect previously treated using septal occlusion device with no success.

After a period of time, a new surgical access procedure was performed on the young man using transcatheter closure procedure. The device should be placed in the atrial septum via catheter introduced into femoral vein. The access was monitored with transesophageal echocardiography. The medical record states that twenty minutes after the start of surgery, a sudden decrease of oxygen saturation, and contemporaneous sub-cutaneous emphysema occurred. In spite of cardio-polmunary resuscitation maneuvers and following placement of the trocar and thoracic drainage system, the young man died, because of a contemporaneous ventricular fibrillation.

External examination revealed a drainage located in left hemithorax in the first intercostal space; another one in the right hemithorax in the fifth intercostal space, two needle marks in the left third intercostal space and in the right second intercostal space; cyanosis of finger nails of both hands was present.

Internal examination revealed emphysema in subcutaneous soft tissue of the thoracic and abdominal regions, in greater omentum and in the visceral adipose tissue. Also observed marked mediastinal emphysema, bilateral pneumothorax and reduced volume of the lungs.

The macroscopic examination of the heart showed collapse of the fossa ovalis, redundant, with diameter of 2.5 centimeters and with two perforations: the first one with maximum diameter of 1 centimeter and the second one of 0.5 centimeter, divided by fibro-muscolar biceps. The right ventricle was dilated with thin walls (0.3 centimeter maximum thickness), left ventricle slightly dilated with a free wall of 1.5 centimeters.

The observation of air breath showed in the right intermedium bronchus an “S”-shaped laceration with frayed margins slightly that involved, in the point of the bifurication with medium lobe, in the extraparenchymal intrapleuric tract, half circumference of the bronchus.

The dissection of the lungs revealed congestion and hemorrhagic edema. There was hypoxic ischemic multiorgan damage.

Histologic assays showed massive right endo-bronchial bleeding and the site of the bronchial lesion was characterized by incomplete breakup of a cartilaginous ring in correspondence of one of the extremities; the adjacent pulmonary vein with massive blood infiltration of the nearest soft tissues. The borders of the vascular breakup were irregularly dissected and infiltrated by blood cells; in the context of the vascular wall other breaches were observed with partial tonaca media’s dissection. Hemorragic edema was found in pulmonary parenchyma with red cells infiltration of the nearest soft tissues and sub-pleural tissues, in association with emphysematous blebs.

On the macro-microscopic evidences the cause of the death has been attributed to an acute respiratory insufficiency by severe pneumothorax following bronchial breakup; the typology of death is attributable to “therapeutic complication.”

Along with the histological assays, the authors have verified the iatrogenic nature of the breakup; besides, using the classic forensic criteria the pathologists have attributed the professional liability to one of the professional figures (echocardiographist, hemodinamist, anesthetist) involved in the management of the young patient. **Transcatheter Closure, Atrial Septum Defect, Bronchial Lesion**

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