

A Case of Patent Foramen Ovale and Chronic Thromboembolic Pulmonary Hypertension in an Adult

Mathangasinghe Y* and Samaranayake UMJE

Department of Anatomy, Faculty of Medicine, University of Colombo, Sri Lanka

***Corresponding Author:** Yasith Mathangasinghe, Lecturer, Department of Anatomy, Faculty of Medicine, University of Colombo, Colombo, Sri Lanka.

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Abstract

Patent foramen ovale (PFO) in adults is gaining much attention related to thromboembolic syndromes. Incidence of PFO varies from 17% to 35% in adults. We present a case of an adult with a PFO presenting with chronic pulmonary embolism and community acquired *Acinetobacter pneumonia* and the cadaveric dissection findings. We also describe the current understanding of the anatomical basis for the PFO.

Keywords: Patent Foramen Ovale; Chronic Pulmonary Embolism; Pulmonary Hypertension

Abbreviations

CTPA: Computed Tomographic Pulmonary Angiogram; PFO: Patent Foramen Ovale

Introduction

Patent foramen ovale (PFO) is a developmental disorder characterized by persistence of a gap caudal to the septum secundum. Incidence of PFO varies from 17% to 35% in adults [1,2]. Undetected PFO can give rise to thromboembolic syndromes in adults [1]. We present a case of an adult with a PFO presenting with chronic pulmonary embolism and community acquired *Acinetobacter pneumonia*.

Case Report

A 68-year-old male presented with a four-month history of progressively worsening exertional dyspnea and productive cough. He was apparently well previously. A 2D echocardiogram showed a patent foramen ovale, ejection fraction of 55%, right to left shunt factor of 33% and severe pulmonary hypertension. Computed Tomographic Pulmonary Angiogram (CTPA) showed evidence of chronic pulmonary thromboembolism and a right lower lobar consolidation. *Acinetobacter baumannii* was isolated in both sputum and blood culture. Patient passed away after four days of hospital admission. Formalin preserved cadaveric dissections showed a 19 mm patent foramen ovale with a hypertrophied pulmonary trunk (Figure 1 and 2).

Discussion

During fetal development, the septum primum develops caudally from the roof of the single primitive atrium. This septum fails to reach the ventricles initially. This gap is known as the ostium primum. Later the gap is filled by the caudal growth of septum primum fusing it with the endocardial cushions. Small perforations appear in the rostral part of the septum primum. These connect to form the ostium secundum. The septum secundum develops right to the ostium secundum. It also develops caudally but fails to reach the endocardial cushions. The gap caudal to the septum secundum is known as the foramen ovale. It is lined circumferentially by the limbus fossa ovalis. During fetal life, blood shunts through this foramen ovale from the right atrium to the left atrium. Soon after birth once respiration is established, pulmonary vasodilation occurs reducing the pulmonary vascular pressure. Thus, left atrial pressure drops below right atrial

pressure. At this point the septum primum opposes with the septum secundum, closing the foramen ovale. Thus, functional closure of foramen ovale occurs at birth. Eventually the septum primum fuses with the septum secundum with fibrosis. This anatomical closure occurs within a period of six to eight months after birth [3].

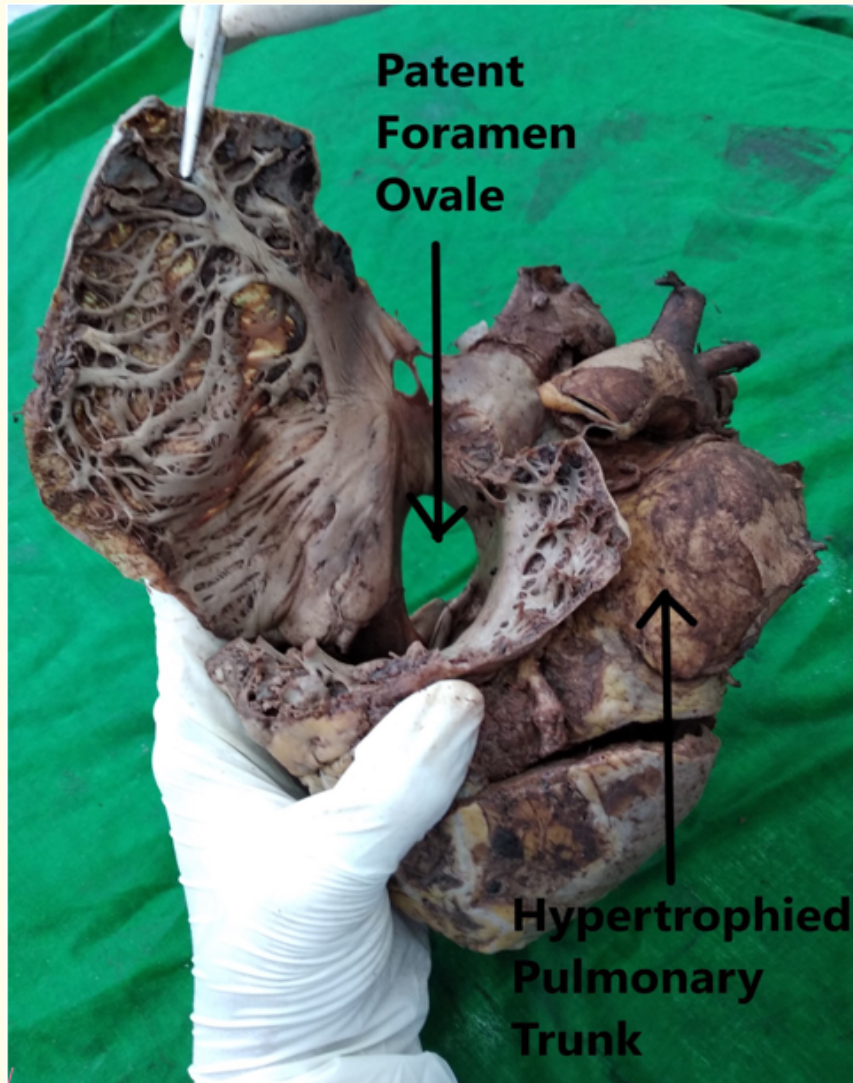


Figure 1: Cadaveric dissection showing the patent foramen ovale and the hypertrophied pulmonary trunk.



Figure 2: Cadaveric dissection. The hypertrophied pulmonary trunk is marked by an arrow.

Paradoxical embolization, chronic obstructive airway disease, pulmonary hypertension and heart failure are reported in association with PFO [4]. Pneumonia and recurrent infections are also associated common findings with a PFO [4]. Treatment methods includes percutaneous PFO closure with a success rate of more than 95% and a periprocedural complication rate of 10% by the use of a variety of PFO occluder devices. Other treatment modalities for patients with PFO and presumed paradoxical embolism include medical treatment with either antiplatelet or antithrombin drugs and surgical PFO closure [5].

Conclusion

Development of the foramen ovale is complex. Failure of fusion of septum primum and secundum leads to PFO. Pulmonary hypertension due to chronic pulmonary embolization and recurrent infections are complications of PFO as seen in this case.

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