OSTIUM SECONDUM ATRIAL SEPTAL DEFECT: A CASE REPORT

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ABSTRACT

Atrial septal defect is one of the commonest congenital cardiac anomaly present in adulthood. An out-sized ostium secondum that persists in adulthood is a cause for ASD. It is commonly regarded as a 'hole' in the septum in the region of foramen ovale and ostium secondum. It is the common form of atrial septal defect, present in 8 out of 10 congenital heart disease. It occurs as a result of defects in septum primum and septum secondum viz. inadequate formation of septum secondum or excessive resorption of septum primum thereby leaving ostium secondum incompletely covered.

Keywords: Interatrial septum, Septum secondum, Ostium secondum, Congenital heart disease.

INTRODUCTION

Congenital defects of the interatrial septum are the most common congenital heart diseases and accounts for about 8 per 1000 live births. 90% of atrial septal defects comprises of Ostium secondum defect. Atrial septal defect occurs with a female preponderance of approximately [F:M=2:1]. Ostium secondum atrial septal defect occurs in the centre between left atrium and right atrium due to incomplete formation of septum secondum or incomplete active closure of ostium secondum.

Atrial septal defects are classified by its size and location.

a) Secondum defect: The defect is in the middle of septum. It is the most common form of ASD which closes on its own, unless it is large. This type is seen in 8 out of 10 CHD. b) Primum defect: The defect is seen in the lower part of the septum. It also involves an incomplete or partial ASD and the valves that separate the atrial and ventricular chambers are not normal, 2 out of 10 babies who are born with ASD have this type of defect which does not close on its own.

c) Sinus Venosus: This defect is seen in the upper part of septum near the opening of superior venacava, which is very rare and is seen in 1 out of 10 ASDs. The babies present with associated partial pulmonary venous return².

OBSERVATION

During routine dissection for I M.B.B.S in the department of Anatomy at Bangalore Medical College and Research Institute, a significantly large opening in the interatrial septum was noted which is called as the Ostium secondum atrial septal defect. The opening was present in the centre of interatrial septum, the shape of the opening was almost circular measuring 2cms vertically and 1.8 cms anteroposteriorly, the margins of the opening was smooth and well defined(fig 1&2). The interior of the heart was observed in detail, the atria and the ventricles appeared to be normal, with normal pattern of blood vasculature, there was no cardiac hypertrophy or dilatation. No other systemic abnormalities encountered.
DEVELOPMENT OF INTERATRIAL SEPTUM
The interatrial septum is a structure that divides the primary atrium into right and left chambers. At the beginning of 5th week of gestation the septum primum, a thin crescent shaped membrane develops, growing towards the endocardial cushions from the roof of the primordial atrium. As it grows, the space between the endocardial cushions and the septum primum gets diminished progressively and a small opening is formed known as the ostium primum, which serves as a shunt enabling the oxygenated blood to pass from the right to the left atrium. Before the septum primum fuses with the endocardial cushions small perforations appear and coalesce in the cephalic portion of septum primum to form another opening, the foramen secondum. Simultaneously the free edge of septum primum fuses with the fused endocardial cushions thus obliterating the foramen primum. The foramen secondum now ensures a continuous flow of oxygenated blood from the right to the left atrium. To the right of septum primum, another crescentic muscular membrane septum secondum grows from the ventrocranial wall of the atrium overlapping the foramen secondum in the septum primum. The septum secondum forms an incomplete partition between the atria and an oval opening is formed—the foramen ovale. The part of septum primum forms the flaplike valve of foramen ovale. After birth the foramen ovale fuses with the cranial end of septum primum and thus forming a complete partition between the two atria.

DISCUSSION
ASDs are the commonest forms of congenital heart disease. Atrial septal defect is characterized by a defect in the interatrial septum allowing pulmonary venous return from the left atrium to pass directly to the right atrium. The formation of foramen secondum and septum primum was discovered in 1935. Ostium secondum defects are relatively larger than PFO defects. Ostium secondum ASDs represent 80-90% of ASDs. Excessive apoptosis of the cephalic portion of the setum primum or incomplete growth of septum secondum results in ostium secondum defect. CT images can differentiate an ostium secondum from a patent foramen ovale. Ostium secondum ASDs are a direct continuation between the two atria, whereas a PFO defect is a tunnel of variable width and length between two atria. Ostium secondum ASDs in adults remain clinically silent for decades, produce left to right shunts. Long standing left to right shunting from ASDs leads to dilatation of the right sided chamber and enlargement of pulmonary arteries. Depending on the size of the defect and size of the shunt this can result in a spectrum of disease from no significant sequel to right sided volume overload, pulmonary hypertension, and atrial arrhythmias. Although heart failure in children is rare due to ASD, this can often occur in adults. Chronic right atrial dilation causing atrial arrhythmias in adults may not be reversible in individuals if the defect is not closed. Contrary to this, data also indicate that closure in adults may not spare these individuals from atrial arrhythmias. ASD is an autosomal dominant inheritance attributed to a gene defect in TBX5. It is shown that TBX5 and GATA4 have a role to play in chamber specification as well as inhibition of cardiomyocyte proliferation resulting in regional morphological features of heart. ECG may be an important clue to diagnosis which shows sinus rhythm, first degree heart block and right axis deviation in ostium secondum defect.

CONCLUSION
Ostium Secondum ASD is a congenital abnormality and therefore, is present at birth. An ostium secondum ASD occurs as a result of excessive apoptosis of the cephalic portion of the septum primum or incomplete growth of septum secondum which fails to cover ostium secondum.
It may be diagnosed at any age, usually the findings go undiagnosed in infancy until the patient presents with symptoms in his/her adulthood. The presence of this defect has been identified as a potential risk factor for stroke due to embolization into the systemic arterial circulation. There is no single, known cause of ASD, interaction of heredity and environmental factors or difference in one or more genes may play a role in ASD. Although an ASD would go undetected, there is always a chance that it can have a negative impact on patient’s life, therefore a precise knowledge of its occurrence and existence in adults can improve the patient’s standard of living and life expectancy.

ABBREVIATION
ASD-Atrial septal defect
CHD-Congenital heart disease
PFO-Patent foramen ovale.

REFERENCES
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Fig 1-Septum secondum defect-1
Interatrial septum-2

Fig 2-0.8cm (Transverse) 2cm (Vertical)