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**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 outsized ostium secundum 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 secundum. 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 secundum viz. inadequate formation of septum secundum or excessive resorption of septum primum thereby leaving ostium secundum incompletely covered.

**Keywords:** Interatrial septum, Septum secundum, Ostium secundum, 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 secundum defect. Atrial septal defect occurs with a female preponderance of approximately [F:M=2:1]<sup>1</sup>. Ostium secundum atrial septal defect occurs in the centre between left atrium and right atrium due to incomplete formation of septum secundum or incomplete active closure of ostium secundum.

Atrial septal defects are classified by its size and location.

a) Secundum 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 return<sup>2</sup>.

**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 secundum 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 5<sup>th</sup> 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 secundum. Simultaneously the free edge of septum primum fuses with the fused endocardial cushions thus obliterating the foramen primum. The foramen secundum 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 secundum grows from the ventrocranial wall of the atrium overlapping the foramen secundum in the septum primum. The septum secundum 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<sup>3</sup>.

## 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 secundum and septum primum was discovered in 1935<sup>4</sup>. Ostium secundum defects

are relatively larger than PFO defects. Ostium secundum ASDs represent 80-90% of ASDs. Excessive apoptosis of the cephalic portion of the setum primum or incomplete growth of septum secundum results in ostium secundum defect. CT images can differentiate an ostium secundum from a patent foramen ovale. Ostium secundum ASDs are a direct continuation between the two atria, whereas a PFO defect is a tunnel of variable width and length between two atria<sup>5</sup>. Ostium secundum 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<sup>6</sup>. 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<sup>7</sup>. 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.<sup>8,9</sup>. ECG may be an important clue to diagnosis which shows sinus rhythm, first degree heart block and right axis deviation in ostium secundum defect<sup>9</sup>.

## CONCLUSION

Ostium Secundum ASD is a congenital abnormality and therefore, is present at birth. An ostium secundum ASD occurs as a result of excessive apoptosis of the cephalic portion of the septum primum or incomplete growth of septum secundum which fails to cover ostium secundum.

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

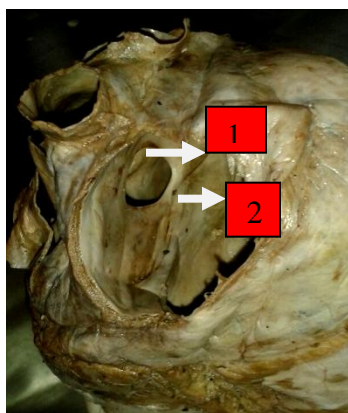
CHD-Congenital heart disease

PFO-Patent foramen ovale

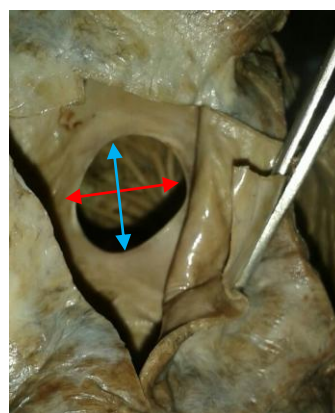
#### REFERENCES

1. Michael.R.Carr, Paediatric atrial septal defects, Medscape-May2,2012.

2. Paediatric Cardiothoracic surgery-atrial septal defects, Paediatric ct.surgery.ucsf.edu
3. Moore and Persaud: The developing human clinically oriented embryology, 6<sup>th</sup> edition, 365-67.
4. PNB Odgers at university of Oxford, Journal of Anatomy, 1935
5. Carlos A. Rojas et al., Embryology and developmental defects of the interatrial Septum American journal of roentology; 195, Nov-2010; 1100-1104.
6. Larry W. Markham. ASD-medscape reference, emedicine.medscape.com/article/162914 Sep.20.2012
7. Ira.H.Gessner, Steven.R.Neish et al., Ostium secundum atrial septal defect, Medscape reference, emedicine.medscape.com/article/890991.Jun.17,2013.
8. Paeditric ASD-The health science.com.Sep 10, 2011.
9. G.webb, Michael.A.Gatzoulis., Atrial septal defects in the adults, American heart Association, Circulation2006;114;1645-53.



**Fig 1**-Septum secundum defect-1  
Interatrial septum-2



**Fig 2** ←→0.8cm (Transverse)  
↕-2cm (Vertical)