

# Septation of Ventricles and Outlet of the Heart

## Septation of the ventricles

It consists of 2 steps:

1. Muscular Septum: Jirásek's stage 6-2 to 8-1 (day 24-52)
2. Membranous Septum: Jirásek's stage 8-1,2 (day 51-55)

From the end of the 4th week, a muscular septum grows superiorly from the floor of the ventricles. It partially divides this area into left and right ventricles. Between the muscular septum and the fused endocardial cushions the Interventricular foramen remains open. The Inferior endocardial cushions (IC) develop on the top of the muscular septum and fuse with the conus septum. The interventricular foramen is closed by the membranous part of the interventricular septum.

## Ventricular septal defects (VSDs)

They represent the most common congenital cardiac malformation. They involve the membranous or the muscular portion of the septum. In 80% of cases they occur in the muscular portion of the septum. But membranous VSDs (20%) are more serious and are usually associated with abnormalities of the conotruncal region (e.g. Tetralogy Of Fallot). Tetralogy of Fallot (TOF):

- Results from abnormal conotruncal septation
- Includes 4 defects:
  1. Pulmonary stenosis
  2. Ventricular septal defect
  3. Dextroposition of the Aorta
  4. Right ventricular hypertrophy

## Heart Outlet Septation

During the 5th week two ridges of tissue (conotruncal ridges or truncoconal swellings) appear on the sides of the truncus arteriosus. These ridges grow towards each other and fuse to make a spiral shaped septum, the aortopulmonary septum. The aortopulmonary septum divides Truncus arteriosus into Aorta and Pulmonary trunk. The conotruncal ridges grow also inferiorly to the ventricles where they fuse with the endocardial cushions to form the membranous part of the interventricular septum and close the interventricular foramen.

At the same time as the truncus arteriosus swellings appear, similar ones develop along the right dorsal and left ventral walls of Conus cordis. These swellings grow toward each other and unite with truncus septum. This fusion divides Conus cordis into:

- Anterolateral portion = outflow tract of right ventricle
- Posteromedial portion = outflow tract of left ventricle

## Outflow tract defects

- Persistent Truncus Arteriosus: the pulmonary artery arises above the origin of the undivided truncus
- DiGeorge sequence:
  1. 22q11 deletion syndrome
  2. Malformations caused by abnormal neural crest development
  3. Involves Persistent Truncus Arteriosus + Tetralogy of Fallot
  4. Valvular stenosis of Pulmonary artery or Aorta: caused by fusion of semilunar valves
- Transposition of the great vessels:
  1. Aorta originates from Right ventricle
  2. Pulmonary artery originates from Left ventricle

## Links

## Related Articles

## Bibliography

- SADLER, Thomas W. *Langmans Medical Embryology*. 12. edition. 2011. ISBN 1451113420.

- NCBI (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1767797/>)
- IPUBLISHCENTRAL ([http://wdn.ipublishcentral.net/wolters\\_kluwer/viewinside/26635280513016](http://wdn.ipublishcentral.net/wolters_kluwer/viewinside/26635280513016))