* L58: Development of venous system
* DR. Rehan
* ***By the end of this session, the student should be able to:***
* Describe formation of vitelline veins.
* Describe formation of umblical veins.
* Describe formation of cardinal veins.
* Correlate this knowledge to clinical conditions.
* Development of venous system
* Around 5th week, three pairs of the major vein appears.
* Vitelline vein
* Umbilical vein
* Cardinal vein
* Development of Vitelline vein
* Before entering in the sinus venosus, vitelline vein form plexus around duodenum and pass by septum transversum
* The developing liver form sinusoids in septum.
* With regression of left sinus horn, right portion of vitelline vein enlarges.
* Development of vitelline vein
* Right hepatocardiac channel form hepatocardiac portion of inferior vena cava.
* Proximal part of left vitelline vein disappears.
* Anastomotic network forms portal vein
* Sup. Mesenteric vein derives from right vitelline vein.
* Distal portion of vitelline vein disappears.
* Development of umbilical vein
* During fourth week, umbilical vein on both sides passes by the side of liver.
* The proximal part will disappear from both sides
* Distal part of right also disappears.
* Only left umbilical vein persist up to 12 wks
* Development of umbilical vein
* With increase in placental circulation, the direct connection will form hepatocardiac channel and left umbilical vein
* After birth, left umbilical vein form ligamentum teres
* Ductus venosus form ligamentum venosum.
* Development of cardinal vein
* Up to 4th week of gestation, cardinal vein form main venous drainage.
* Anterior cardinal vein drain cephalic part of embryo.
* Posterior cardinal vein drain the remaining
* Common cardinal vein
* Development of cardinal vein
* From 5th to 7th week, number of additional veins are formed.
* Sub cardinal veins
* Sacricardinal veins
* Supracardinal veins
* Development of venous system
* Anastomosis between anterior cardinal vein will form future left brachiocephalic vein
* This will channelize blood from left side of head and neck to right
* Terminal part of left post. Cardinal vein will retained as left sup. Intercostal vein
* Development of venous system
* Formation of Sup. Vena cava
* Formation of internal jugular vein
* Extenal jugular derives from venous plexus in face
* Left renal vein formed b anastomosis of subcardinal vein
* Distal part of left subcardinal vein persist as left gonadal vein.
* Renal segment of inferior vena cava
* Development of venous system
* Left common iliac vein
* Sacrocardinal segment of inferior vena cava
* Body wall is drained by supracardinal vein after 7th week
* Its is drained by 4th to 11th right intercostal vein
* Formation of azygos vein
* 4th to 7th left intercostal vein drained in left supracardinal vein
* Clinical correlations
* **Double inferior vena cava:** persistence of the connection between sacrocardinal and subcardinal vein
* **Absence of inferior vena cava**: failure in the connection between right subcardinal vein with hepatic segment
* Clinical correlations
* **Left superior vena cava:** persistence of left anterior cardinal vein
* **Double superior vena cava:** persistence of left anterior cardinal vein and failure of the formation of left brachiocephalic vein.
* Summary
* References
* Langman’s medical embryology, 12 edition.
* http://www.uco.es/organiza/departamentos/anatomia-y-anat-patologica/embriologia/T8\_SistemaCirculatorio/eng/development\_of\_the\_venous\_system.html