BLOOD SUPPLY OF HEART.

Heart is supplied by 2 coronary arteries. - right & left Coronary arteries.

anatomically, coronary arteries are not end arteries, but functionally they behave like end arteries.

Right Coronary artery.

Origin

- arise from anterior aortic sinus of ascending aorta, immediately above aortic valve.

Course

- after arising it runs betwn. ~~ascending aorta~~ & right auricle & pulmonary trunk.
- descends in Right AV groove almost vertically, till inferior border., then turns posteriorly and runs in posterior AV groove. upto posterior IV groove.
- terminates by anastomosing with left coronary artery.

Branches

- Right Conus artery. : supplies pulmonary conus.
- Atrial branches: Supply atria.
  One of them → artery of SA node.
  supplies SA node in 60%.
  In 40% → arise from left Coronary A.

Left Coronary artery.

Origin:

- arise from Left posterior aortic sinus of ascending aorta, immediately above aortic valve.

Course

- after arising, runs between pulmonary trunk and left auricle.
- ~~descends~~ splits into 2 branches → circumflex artery & anterior interventricular artery / LAD.
  it runs in anterior IV groove to terminate by anastomosing with posterior IV artery. & turns posteriorly
- Circumflex artery winds around left margin of heart and continues in left posterior coronary sulcus upto posterior IV groove, and terminates by anastomosing with right coronary artery.

Branches

- Conus artery : supplies pulmonary conus
- Atrial branches: supply left atrium

Anterior ventricular branches.

- 2-3 → supplies anterior surface of right ventricle.
- marginal branch is largest.
  ↓
  runs along lower margin of S.C surface till apex.

Posterior ventricular branches

- usually 2 → supply diaphragmatic surface of R&L ventricle.

Posterior Interventricular artery.

- runs in posterior IV groove upto apex.
- supplies → posterior part of IV septum.
- AV node → 60% cases.
- supplies left ventricle.

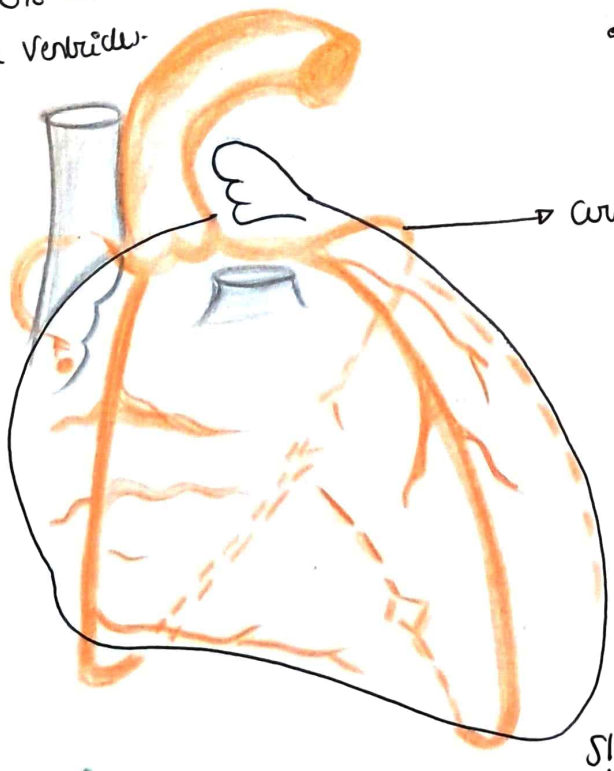
- diagonal artery → directly from trunk.

Circumflex artery

- gives left marginal artery.

Anterior IV artery

- runs in anterior IV groove.
- supplies → anterior part of IV septum.
- greater part of left ventricle & part of right ventricle.
- part of left bundle branch of his.



→ circumflex.

- Posterior IV artery
  90% — right coronary artery.
- 10% — left Coronary artery

- Anastomoses exist @ arteriolar lvl.
  ↙ ↘ of occlusion
  Slowly → time for establishing collateral.
  Sudden → no time for collateral circulation

Read about MI & Angina

2. Describe heart under following headings.

(a) External features - Surfaces, borders & grooves and sulcus with contents.

(b) describe blood supply of heart.

(c) add a note on Coronary dominance.

(d) applied anatomy.

(a) Surfaces.

(1) Anterior / sternocostal surface: mainly by right atrium & right ventricle. & partly by left atrium & left ventricle.

→ area of superficial cardiac dullness.

(2) Inferior / diaphragmatic surface: left 2/3rd by left ventricle. right 1/3rd by right ventricle.

(3) left surface. → mostly left ventricle & upper end left auricle.

Borders:

(1) upper border : by two atria, chiefly → left atrium.

(2) right border : vertical. formed by right atrium. extend from SVC to IVC.

(3) Inferior border : nearly horizontal. formed mainly by right ventricle. extend from IVC to apex

(4) left border : oblique & curved. mainly by left ventricle & partly by left auricle. extend from apex to left auricle.

Grooves and sulcus:

- atria seperated from ventricle → circular atrioventricular or coronary sulcus → anterior, posterior. (faintly visible.)

anterior, posterior → right, left.

right half → coronary artery

left part → circumflex branch of left coronary artery.

anterior IV groove is nearer to left margin of heart. runs down and to left → loses ext. → seperate apex from inferior border of heart.

posterior IV groove → diaphragmatic surface → ~~coronary sinus~~. posterior IV artery & middle cardiac vein.

(5) Blood supply of heart. Arterial supply.

Heart is supplied by 2 coronary artery arising from ascending aorta.

right coroncary artery.

position: smaller than left coronary artery.
arise from anterior aortic sinus.

course: first pass forward btw root of pulmonary trunk & Right auricle.
→ then run down → right ant coronary sinus
→ winds around inf border to reach - diaphragmatic surface.
→ Terminate by anastomosing with left coronary artery - circumflex branch.

Branches: arterial branch → Ant, post, late.
→ right conus artery
→ ventricular branch → ant & post.
→ right marginal artery
→ Post. IV branch → lie in IV groove.

area of distribution: Rt atrium.
ventricle - great part of Rt ventricle.
small part of Lt. V.

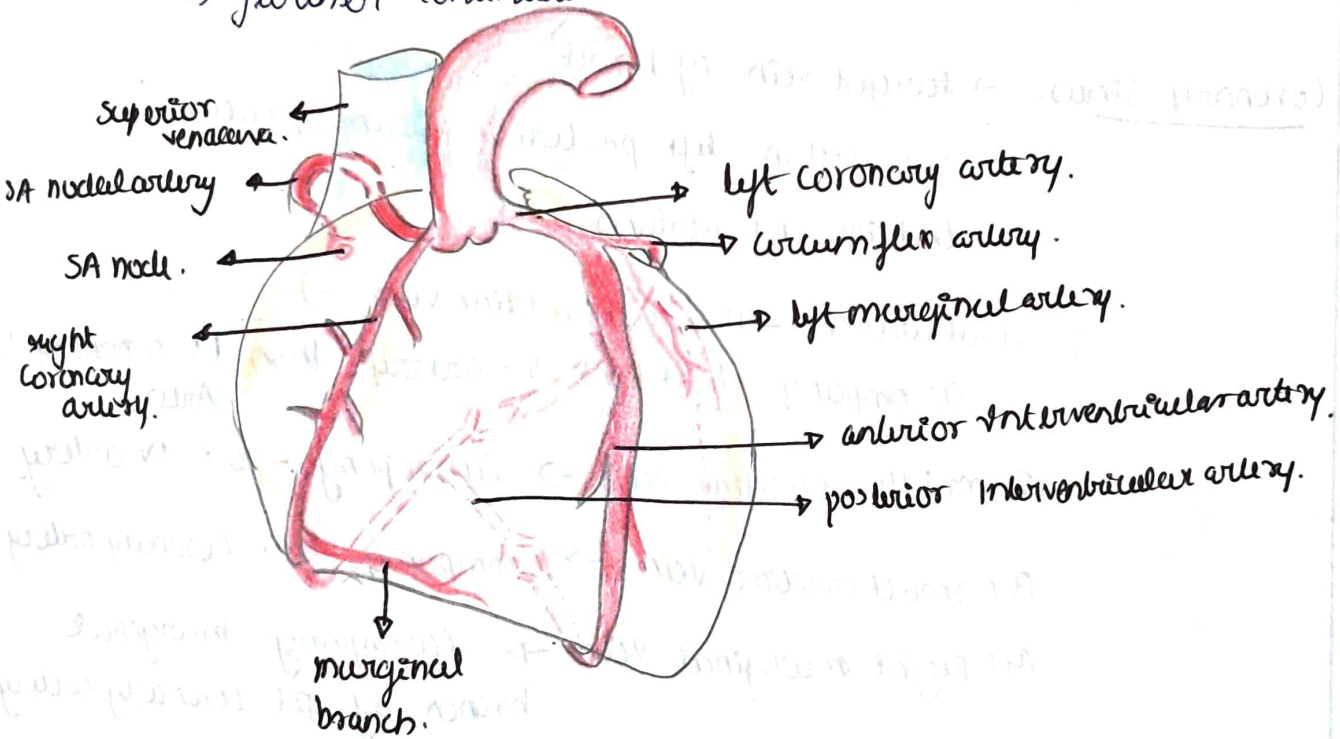
Left Coronary arteries.

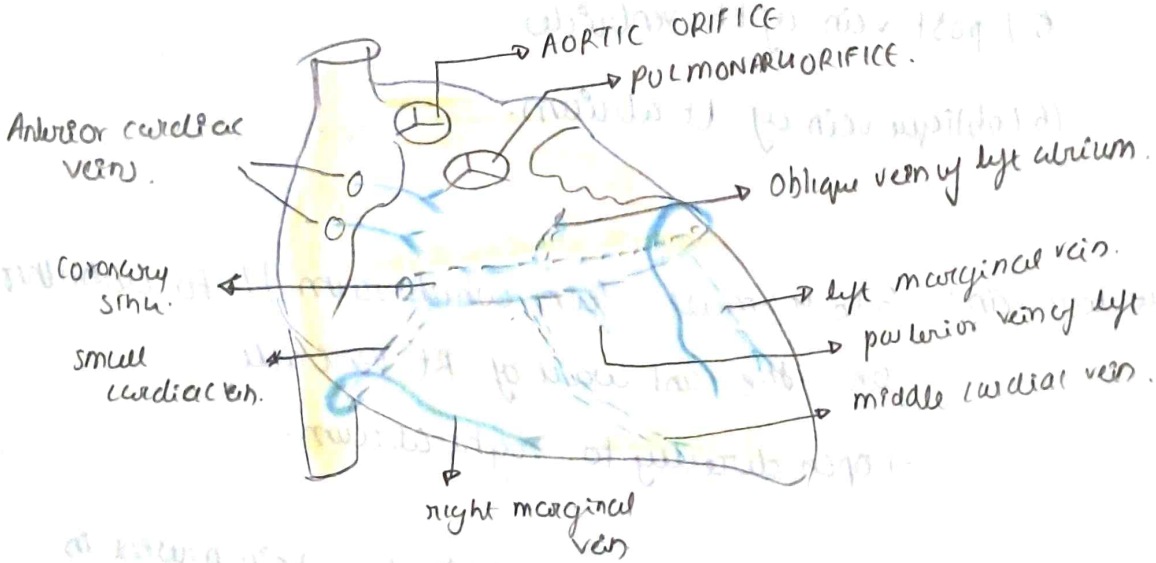
position : arise from left aortic sinus.

Course. first run forward & but end emerge btw pulmonary trunk & left auricle.

→ here it give the IV branch which run downward in groove of same name.

→ further continuation is circumflex artery.





Anterior ventricular branches.

VEINS of heart.

↳ these are great cardiac vein, middle cardiac, Rt marginal vein, post vein of lt ventricle, Anterior cardiac vein, venae cordis minimi.

↳ all veins except ant cardiac → open into coronary sinus.
venae cordis minimi → open directly to right atrium.

Coronary sinus. → largest vein of heart.
→ situated in left posterior coronary sulcus
end into Rt atrium.

Tributaries → (1) great cardiac vein →
accompany first ant. V. artery than lt coronary Artery.

(2) middle cardiac vein → accompany - post IV artery.

(3) small cardiac vein. → accompany Rt. coronary artery

(4) Right marginal vein → accompany marginal branch of Rt. coronary artery.

(5) post vein of lt ventricle.

(6) oblique vein of lt atrium.

Anterior cardiac vein: 3 to 4 small vein which runs // to each other.
on the ant. wall of Rt ventricle.
→ open directly to right atrium.

venae cordis minimi → Numerous small valveless vein present in all four chambers of heart - directly open to right atrium.

Coronary dominance.

- In about 10% hearts, right coronary artery is rather small and is not able to give the post. IV branch. In these cases, the circumflex artery, the continuation of left coronary, provides posterior IV branch as well as to AV node.

Such cases are left dominant.

Mostly, the right coronary artery gives posterior IV artery. Such hearts are right dominant.

Applied anatomy.

- thrombosis is coronary artery is a common cause of sudden death in middle aged. due to MI & ventricular fibrillation.
- Incomplete obstruction, : spasms of coronary artery → angina pectoris,
- coronary angiography → determine site of narrowing of
- angioplasty → remove small blockage.
- coronary bypass.