

A Cadaveric study of coronary artery dominance and its clinical significance

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Abstract:

Background- The heart receives its nutrition through the coronary arteries. They are the right and left coronary arteries. Coronary arteries are located in the epicardium which finally penetrate into the myocardium. **Aim and Objectives:** To Observe the coronary artery dominance in human cadaveric hearts. **Material & Methods:** The study was carried out on 120 human cadaveric hearts from the Department of Anatomy, IMC&H Indore (M.P.), AFMS&RC Faridabad (Haryana), DYSPGMC Nahan (HP). **Result:** Present study we observed that the right dominance in 89.16% specimens and left dominance in 8.33% specimens. Balanced dominance was also observed in 2.5% specimens. **Conclusion:** The data of the present study will be helpful for interpretation of coronary angiography and surgical myocardial revascularisation

Key words – Dominance, Angiography, Cadaveric

Introduction-

The heart receives its nutrition through the coronary arteries. They are the right and left coronary arteries. Coronary arteries are located in the epicardium which finally penetrate into the myocardium. The term Coronary Dominance is used to refer to the coronary artery giving origin to the posterior inter-ventricular artery (PIVA). If PIVA arises from the RCA the term “Right dominance” is used. If it arises from the left circumflex artery (LCX), which is the branch of left coronary artery, the term “Left dominance” is used. When both the RCA and LCX give origin to PIVA, it is expressed as “Balanced dominance”, where branches of both the arteries run in or near the posterior interventricular groove. Coronary artery disease is one of the major causes of death in the developed countries. The incidence of heart disease is increasing because of urbanisation, sedentary life style, unhealthy food habits and co-morbid conditions like hypertension and diabetes⁴.

Material & Methods:

The study was carried out on 120 human cadaveric hearts from the Department of Anatomy, IMC&H Indore (M.P.), AFMS&RC Faridabad (Haryana), DYSPGMC Nahan (HP).

The specimens were obtained from cadavers during the routine teaching sessions of dissections for undergraduate MBBS students. The thoracic cavity was opened after cutting the ribs and sternum.

The origin of Posterior Interventricular Artery (PIVA) and its course in the posterior interventricular sulcus was observed for determining the Coronary Artery Dominance

Results

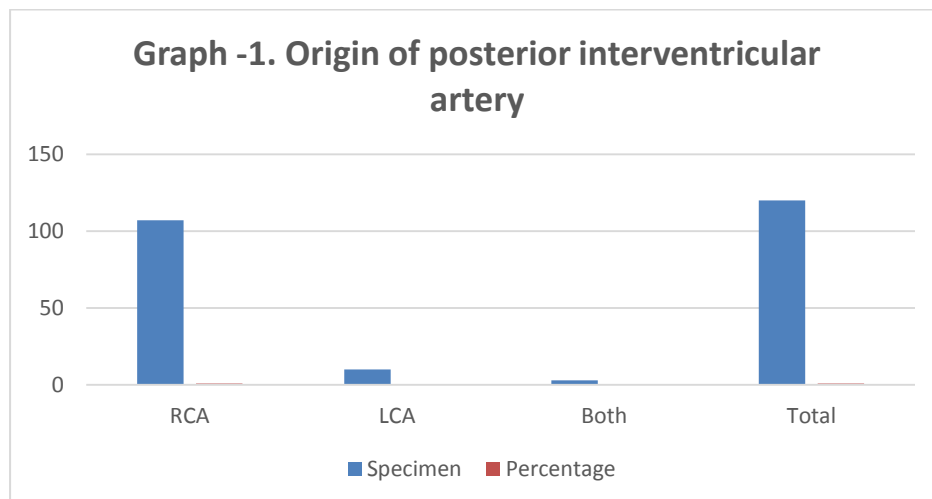
The present study was conducted in 120 specimens of cadaveric hearts and observed the coronary artery dominance.

Table – 1: Origin of posterior interventricular artery:

Origin Of PIVA	Specimen	Percentage
RCA	107	89.16%
LCA	10	8.33%
Both	3	2.5%
Total	120	100%

In the present study we observed that the posterior interventricular artery originated from RCA in 107 specimens (89.16%) and from LCA in 10 specimens (8.33%).

PIVA originated from both RCA and LCA in 3 specimens (2.5%).



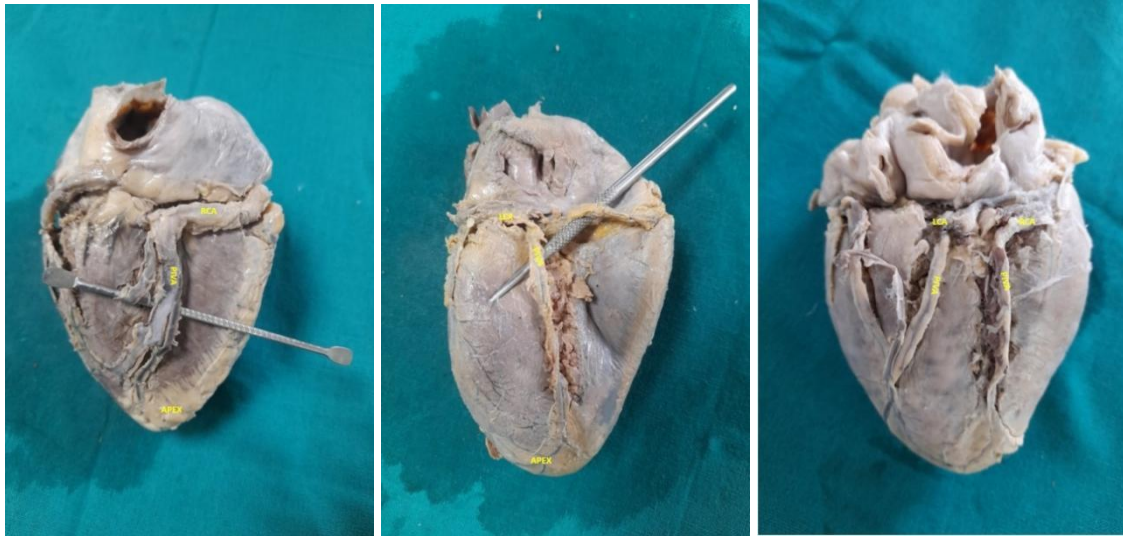


Fig.-1 : PIVA arises from RCA

Fig.-2: PIVA arises from LCA

Fig.-3: PIVA arises from Both RCA and LCA

Discussion

Right Dominance: Damor et al., Kalpana R (2003), Gathe and Pandit (2016), Dakhane et al. (2016), Chougale P et al, Nordon D G et al, Nagaraj et al, Jyoti P kulkarni et al, Cavalcanti et al reported 90%,89%,89.47%,88%,89%, 88%, 90%, 90% 88.18%, of specimens respectively with right dominance. The findings are comparable with the present studies where 89.16% of specimens were reported with right coronary dominance pattern.

Left Dominance: Priyadharshini and sivakumar (2016), Agarwal and Arya(2016), Nordon D G et al observed 8%,8%,8% of specimens respectively with left dominance. The findings are comparable with the present studies where 8.33% % of specimens were reported with left coronary dominance pattern.

Table -2: showing comparison of origin of PIVA-

Author	Right Dominance	Left Dominance	Balance Dominance
Kalpana R (2003)	89	11	-
Damor et al. (2015)	90	10	-
Jaishree and Ashwini (2015)	83	14.5	2
Priyadharshini and siva kumar (2016)	84	8	8
Gathe and Pandit (2016)	89.47	10.52	-
Dakhane et al. (2016)	88	10	2
Agarwal and Arya*(2016)	86	8	2
Chougale P	89	11	0
Nordon D G	88	8	4
Jyoti P kulkarni	90	10	0

Nagaraj	90	6.67	3.33
Cavalcanti	88.18	11.82	--
Present Study	89.16%	8.33%	2.5%

Balance Dominance:

Jaishree and Ashwini (2015), Dakhane et al. (2016), Agarwal and Arya*(2016) observed 2%,2% and 2% of specimens respectively with balance dominance. The findings are comparable with the present studies where 2.5% % of specimens were reported with balance dominance pattern.

Conclusion –

The coronary dominance was determined by the origin of Posterior inter ventricular artery (PIVA). Present study we observed that the right dominance in 89.16% specimens and left dominance in 8.33% specimens. Balanced dominance was also observed in 2.5% specimens. The degree of severity of myocardial infarction is more and may lead to death in single attack if there is obstruction in the LCA as in cases of left dominance. In individuals with balanced dominance, even in case of obstruction of one of the coronary artery the other artery is able to nourish the inter ventricular septum and the region adjacent to it.

The data of the present study will be helpful for interpretation of coronary angiography and surgical myocardial revascularisation.

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