

Study of Right Marginal Artery in Adult Human Hearts of Hyderabad Karnataka Region

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Abstracts: Background and objectives: Coronary artery anomalies are known to be associated with congenital heart defects, myocardial ischemia and reduced life expectancy. The sound knowledge of coronary artery anatomy is necessary for proper management of patients undergoing evaluation for percutaneous coronary intervention, coronary artery surgery or prosthetic valve replacement. The present study is done to determine the origin, course and variation of right marginal artery for proper diagnosis and treatment of the heart diseases. **Materials and Methods:** The present study is done on 76 adult heart specimens obtained from routine dissection conducted for undergraduate students in the Department of Anatomy at Bidar Institute of Medical Sciences, Bidar and also from other nearby medical colleges of Karnataka and Maharashtra. The data obtained is tabulated and analysed statically. **Results:** In our study it is observed that the right marginal artery is present in 88% cases and is absent in 12% cases. Right marginal artery terminates before inferior border in 19%, in between inferior border and apex in 78%, and in 3% cases right marginal artery terminates at apex. **Conclusion:** The present study is done to know the normal and variant anatomy of right marginal artery in Hyderabad Karnataka region to provide vital inputs for making a correct diagnosis and planning treatment for procedures like coronary angiography, stenting procedures and surgical myocardial revascularization as the right marginal artery terminating at apex can irrigate the inferior third of heart, diaphragmatic area limiting the possibility of ischemic process in the occlusion of anterior interventricular artery. [Kshirsagar S NJIRM 2015; 6(1):49-51]

Key Words: Right marginal artery; Right coronary artery; Branching pattern; Coronary artery disease.

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Introduction: Right marginal artery is a branch of right coronary artery. It is the largest branch and runs along lower margin of costal surface of the heart to reach the apex and supplies the inferior diaphragmatic surface of heart.¹

Coronary artery disease is one of the major causes of death in developing countries. The increasing use of diagnostic and therapeutic interventional procedures necessitates a sound, basic knowledge of the coronary artery pattern. Coronary artery anomalies are gaining consideration as a cause of coronary heart disease in the diagnosis workup. One of the subsets of coronary artery anomalies is the anomalous origin. This subgroup has important clinical manifestations, including sudden death, especially in young athletes.²

Knowledge of normal and variant Anatomy and anomalies of coronary circulation is an increasingly vital component in managing congenital and acquired heart disease. Congenital, inflammatory, metabolic or degenerative disease may involve coronary circulation and increasingly complex cardiac surgical repairs demand enhanced

understanding of the same to improve operative outcomes.³

The advances made in coronary arterial bypass surgeries and modern methods of myocardial revascularization make it imperative that a thorough, sound and complete knowledge of the normal and variant anatomy of coronary artery and circulation is required.⁴

The knowledge of coronary circulation is not only important for anatomists but also for radiologists and cardiologists performing angiographies and shunt surgeries of diseases involving the coronary arteries. Hence this study is done to obtain the data and to enrich the knowledge of the vascular pattern of the right marginal artery, its origin, course and level of termination in population of Hyderabad Karnataka region which can be of immense help to clinicians.

Materials and Methods: Source Of Data: The sample size used for this study is 76 heart specimens. The specimen of adult human hearts used for this study were obtained from routine

dissection conducted for undergraduate students in the Department of Anatomy at Bidar Institute of Medical Sciences, Bidar and also at other nearby medical colleges of Karnataka and Maharashtra. The origin, course, and level of termination of pattern of right marginal artery is studied by dissection method.

Methods: The specimens were collected from the cadavers during routine dissection for undergraduate medical students.

The thoracic cavity is opened by cutting the ribs and sternum. The great vessels were ligated by tying thread at two places and then cut in between. The parietal pericardium is incised and heart along with great vessels is taken out of the pericardial cavity. Each specimen is thoroughly washed to free it from the blood clots. All specimens were preserved in 10% formalin solution. The specimens were labelled numerically.

The origin of right coronary artery from the ascending aorta is identified. The right coronary artery lies in between right auricle and right side of pulmonary trunk. Then the right coronary artery is dissected along its course running in the right atrioventricular groove. All the branches of right coronary artery on the anterior surface were identified. Then the right marginal artery which is a large branch on the inferior surface of heart arising from the right coronary artery is identified. The right marginal artery is dissected along its course. The origin, course and the level of termination of right marginal artery is dissected in all the specimens of heart and recorded.

Figure 1: Photograph of Anterior View Of Heart Showing Absence Of Right Marginal Artery.

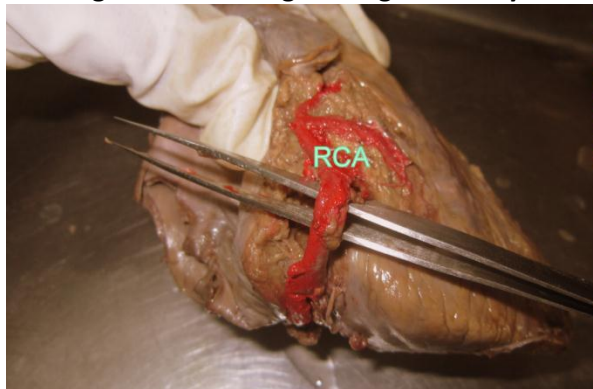
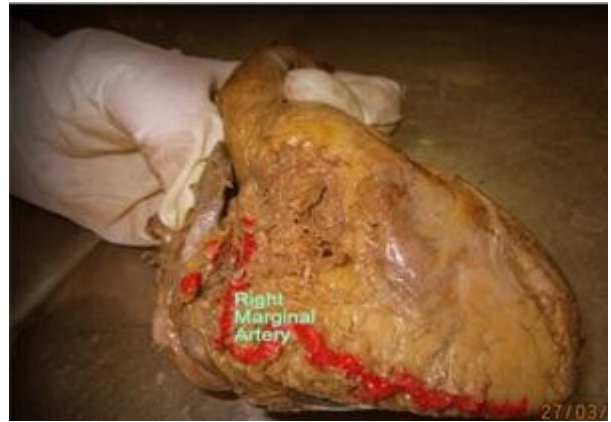


Figure 2: Photograph Of Anterior View Of Heart Showing Right Marginal Artery Continuing Up To Apex.



Results: Presence of Right Marginal Artery.

Table1: Showing Presence of Right Marginal Artery.

| Right marginal artery | specimen | Percentage |
|-----------------------|----------|------------|
| Present | 67 | 88% |
| Absent | 9 | 12% |
| Total | 76 | 100% |

It is observed that the right marginal artery is present in 67 (88%) out of 76 cases and is absent in 9 out of 76 cases (12%).

Level of Termination of Right Marginal Artery: The right marginal artery terminates before inferior border in 13 out 76 cases (19%), in between inferior border and apex in 52 (78%) cases, in 2 (3%) cases right marginal artery terminates at apex.

Table2: Showing Level of Termination of Right Marginal Artery.

| Termination | Specimen | Percentage |
|-------------------------------------|----------|------------|
| Before inferior border | 13 | 19% |
| In between inferior border and apex | 52 | 78% |
| At apex | 2 | 3% |
| Total | 67 | 100% |

Discussion: In our study it is observed that the right marginal artery is present in 88% cases and is absent in 12% cases which is similar to the authors reported earlier. All authors tabulated above showed similar observations of absence of right marginal artery.

Table3: Showing Comparison of the Presence of Right Marginal Artery

| Right marginal artery | A Hossain et al ⁵ (n=60) | Sarker MSA ⁶ (n= 54) | Present study (n=76) |
|-----------------------|-------------------------------------|---------------------------------|------------------------------------|
| Present | 90% | 91% | 88% |
| Absent | 10% | 9% | 12% |
| Population | Bangladesh | Bangladesh | Hyderabad Karnataka Region (India) |

Table4: Showing Comparison of the Presence of Right Marginal Artery

| Termination | A Hossain et al ⁵ | Present study |
|-------------------------------------|------------------------------|---------------|
| Before inferior border | - | 19% |
| In between inferior border and apex | 75% | 78% |
| At apex | 25% | 3% |

In our study the termination of right marginal artery in between inferior border and apex is 78% which is similar to the findings of A Hossain et al⁵ (75%). However the incidence of termination of right marginal artery at apex reported by A Hossain et al⁵ (25%) is higher when compared to our study (3%). In our study the right marginal artery terminates before inferior border in 19% cases.

Conclusion: Right marginal artery is present in 88% cases, it terminates before inferior border in 19%, in between inferior border and apex in 78%, and in 3% cases right marginal artery terminates at apex. The knowledge of right marginal artery is important because in the presence of occlusive anterior interventricular artery, the right marginal artery terminating at apex can irrigate the inferior and diaphragmatic surface of heart limiting the possibility of ischemic process. Considerable variation in presence and level of termination of

right marginal artery in Hyderabad Karnataka region is noted when compared to other studies. Knowledge of right marginal artery is important in cardiac operations, angioplasty and stent placement.

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