ORIGINAL ARTICLE

VARIATION IN OSTIUM OF CORONARY ARTERIES

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ABSTRACT

Introduction: Left and right coronary arteries supply blood to the heart arising from ascending aorta. Any coronary artery disorder can have serious implications by reducing the flow of oxygen to heart, which may lead to a heart attack and possibly death. Certain coronary artery anomalies may indirectly affect the patient's prognosis. Therefore knowledge of coronary is necessary.

Methodology: The 100 specimens were collected. These were fixed in 10% Formalin solution. Then Aorta was dissected to display the origins of the right, left coronary. The aortic root was split postreriorly to enable a clear view of the aortic sinuses with coronary ostium.

Results: Left and right coronary arteries supply blood to the heart muscle. They arise from ascending aorta. . RCA arises from right anterior aortic sinus in all cases. Ostium of RCA was most commonly arising below sinotubular junction in 98(98%) specimens. We had observed location of ostia of Right and Left coronary artery present in Rt. Anterior aortic sinus and Lt. Anterior aortic sinus respectively 100%(100) in all specimens.

Conclusion: Ostium of RCA was below sinotubular junction in 91(91%) specimens and above sinotubular junction was 9(9%) in case of RCA and was below sinotubular junction in 94(94%) specimens and above sinotubular junction was 6(6%) in case of LCA. If the Ostium are above the sinotubular junction, they remain open in both systole and diastole of the heart and coronary blood flows continuously. So coronary insufficiency is less and also may have good prognostic value.

Keywords: Right Coronary artery, Left Coronary artery, Ostium, Aortic sinus, Sinotubular junction

INTRODUCTION

Coronary arteries supply blood to the heart muscle. They arise from ascending aorta. The two main coronary arteries are the left and right coronary arteries. Since coronary arteries deliver blood to the heart muscle, any coronary artery disorder or disease can have serious implications by reducing the flow of oxygen and nutrients to the heart, which may lead to a heart attack and possibly death. Certain coronary artery anomalies may indirectly affect the patient's prognosis. These examples illustrate the importance of a precise knowledge of Coronary.

Coronary artery anomalies (CAAs) are a diverse group of congenital disorders whose manifestations and pathophysiological mechanisms are highly variable. The subject of CAAs is undergoing profound evolutionary changes related to the definition, morphogenesis, clinical presentation, diagnostic workup, prognosis, and treatment of these anomalies. To understand the clinical impact of CAAs, the fundamental challenge is the firm establishment, for a particular type of CAA, of a mechanism capable of interference with the function of coronary artery, which is to provide adequate blood flow to the dependent myocardium[2].

MATERIAL AND METHODS

The 100 formalin fixed specimens from cadavers for this study were obtained from the Anatomy Department of various medical colleges of Gujarat. The specimens were collected without any age, sex, socio-economic status, and religion, educational or pathological basis. The specimens thus collected were serially numbered 1 to 100. These were preserved in 10% Formalin solution. Then Aorta was dissected to display the origins of the right, left coronary arteries . Location of ostia of Right and Left coronary artery are present in Rt. Anterior aortic sinus and Lt. Anterior aortic sinus respectively in all specimens.The aortic root was split postreriorly to enable a clear view of the aortic sinuses with coronary ostium. Level of aortic sinus detected in relation to sinotubular junction.Data collected after dissection entered in microsoft office excel. Same software is used for calculation of percentage and other related calculations.

OBSERVATION

Location of ostia of Right and Left coronary artery are

present in Rt. Anterior aortic sinus and Lt. Anterior aortic sinus respectively in all specimens. Ostium of RCA was below sinotubular junction in 91(91%) specimens and above sinotubular junction was 9(9%) in case of RCA and was below sinotubular junction in 94(94%) specimens and above sinotubular junction was 6(6%) in case of LCA.

Table 1: Level of Ostium in present study

Level of ostium	Present Study	
	RCA	LCA
Below sinotubular junction(STJ)	91%	94%
At STJ	0%	0%
Above STJ	9%	6%

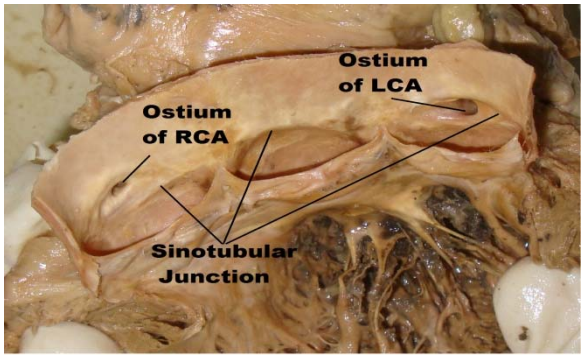

Fig. 1: Shows ostium of right and left coronary artery in right anterior and left anterior aortic sinus respectively. Ostium of RCA is above the Sinotubular junction and ostium of LCA is below the sinotubular junction

DISCUSSION

Branches of coronary arteries may vary in origin, distribution, number and size. The name of a coronary artery or a branch is defined by that vessel's distal vascularisation pattern or territory, rather than by its origin. The location, level and size of the ostium are very important in the successful performance of a coronary angiography by Engel & Torres[2] 1975).

According to the literature, coronary anomalies affect <1% of the general population; this percentage is derived from cine angiograms performed for suspected obstructive disease (Baltaxe HA et al[3], 1977: Click RL et al[4], 1989; Yamanaka O et al[5], 1990).

Location of ostia of Right and Left coronary artery present in Rt. Anterior aortic sinus and Lt. Anterior aortic sinus respectively 100%(100) in all specimens. Ectopic origin in RCA has been observed with an incidence of 0.17% - 0.38% in RCA and 0.05%-0.19% in LCA in angiographic series (Chaitman et al[6], 1976; Kimbiris et al[7], 1978; Topaz et al[8], 1992), and with an incidence of 0.03% in RCA and 0.02% in LCA in a autopsy series (Alexander and Griffith[9], 1956). The incidence in necropsy series is somewhat greater than that of the left coronary artery originating in the right aortic sinus although its angiographic incidence is lower. This is probably due to the fact that patients affected by the former anomaly usually present ischemic complications more frequently.

In present study the Ostium of Coronary Arteries was below sinotubular junction in 91(91%) specimens and above sinotubular junction was 9(9%) specimens in case of Right Coronary Artery while below sinotubular junction in 94(94%) specimens and above sinotubular junction was 6(6%) specimens in case of Left Coronary Artery. Below this observation are compared with other study. These observations are matching with observation done by Kalpana R.[10], 2003 but do not match with findings of B Pejkovi´c, et al[11] 2008. Such variation in observation may be because of racial variation but to confirm that it requires further study.

Table 2: Comparison between different studies of level of ostium of Coronary Arteries

Level of ostium	Present Study		Kalpana R., 2003[10]		B Pejkovi´ et al[11]	
	RCA	LCA	RCA	LCA	RCA	LCA
Below sinotubular junction(STJ)	91%	94%	90%	80%	19%	18%
At STJ	0%	0%	9%	20%	71%	22%
Above STJ	9%	6%	1%	0%	10%	60%

The observation of present study supports the other study done by dissection method but denies the study done by angiography. It can be explained on the basis of accuracy of identification of branches in both methods. Secondly blood flow in coronary arteries only in diastole of the ventricle if ostium are below the sinotubular junction as the Ostium is closed by cusps of the valve. But if the ostia are above the sinotubular junction, they remain open in both contraction and diastole of the heart and coronary blood flows continuously. So such person suffers less from coronary insufficiency and asked less for angiography. That is why results of angiographic study are less than dissection study. Confirmation of this conclusion requires further study.

CONCLUSION

We had observed location of ostia of Right and Left coronary artery present in Rt. Anterior aortic sinus and Lt. Anterior aortic sinus respectively 100%(100) in all specimens. Ostium of RCA was below sinotubular junction in 91(91%) specimens and above sinotubular junction was 9(9%) in case of RCA and was below sinotubular junction in 94(94%) specimens and above

sinotubular junction was 6(6%) in case of LCA. If the ostiums are above the sinotubular junction, they remain open in both contraction and diastole of the heart and coronary blood flows continuously. So such person suffers less from coronary insufficiency and also may have good prognostic value.

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