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MORPHOLOGICAL STUDY OF MYOCARDIAL BRIDGE ON THE CORONARY ARTERIES IN HUMAN CADAVERS OF INDIAN REGION

Anatomy

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ABSTRACT

Coronary arteries and their branches travel along the surface of heart under epicardium. However a portion of these arteries may be embedded in the muscle called MB and the submerged coronary artery is called mural coronary artery. The knowledge about the number, length and depth of myocardial can help in identifying the people at risk. Coronary artery disease (CAD), also known as ischemic heart disease (IHD), is a group of diseases that includes: stable angina, unstable angina, myocardial infarction, and sudden cardiac death. With the above background, the present study has been undertaken to study the prevalence of myocardial bridges in the coronary arteries. The knowledge about the number, length and depth of myocardial can help in identifying the people at risk. With the above background, the present study has been undertaken to study the prevalence of myocardial bridges in the coronary arteries. The study had included the 50 adult human cadavers used for the routine dissection procedure. Total 50 hearts specimens were collected. The clinical significance of myocardial bridges is uncertain and in the vast majority of cases, it remains clinically silent or acts a contributing factor in the devel opment of myocardial ischaemia, circulatory problems, angina, myocardial infarction, sudden cardiac death, systolic compression and other cardiac disturbances that may require surgical intervention.

KEYWORDS

Myocardial bridge, Coronary arteries, cardiologists,Coronary heart disease.

INTRODUCTION:

Coronary artery disease is one of the major causes of deaths in developing countries. In the normal heart, oxygenated blood is supplied by two coronary arteries that arise from the ascending aorta. The LMCA originates from the left posterior aortic sinus and it runs towards left, under the left auricle. After a short course, it divides into two vessels, left anterior descending artery and circumflex artery [1]. The left coronary artery presents wide variability in its morphology with regard to length, calibre and the number of branches of its trunk. The left coronary artery trunk (LCAT) divides in several ways; it bifurcates, producing the anterior interventricular branch (AIB) and the circumflex branch (CxB), trifurcates, producing AIB, CxB and a diagonal branch (DB),and tetrafurcates, producing AIB, CxB and two DBs. Such bifurcated expression has been described as being the most frequent [2–4, 5].

During its course a segment of the epicardial coronary arteries may dip into the myocardium for varying lengths, the segment termed as tunneled or mural artery and the overlying myocardium as myocardial bridge .Though it was recognized at autopsy by Reyman (1737)[6] but they were first described as myocardial bridges in 1951 by Geiringer[7]. Later Portmann and Iwig in 1960 described it angiographically [8]. Dominant left system with greater number of myocardial bridge is at disadvantage with increased risk of ischemia. Also myocardial bridges have been reported in association with sudden death during exercise, but they are also an incidental finding at autopsy in upto 25% of patients dying of other causes. A common symptom is chest pain or discomfort which may travel into the shoulder, arm, back, neck, or jaw. Hence knowledge about the number, length and depth of myocardial can help in identifying the people at risk. With the above background, the present study has been undertaken to study the prevalence of myocardial bridges in the coronary arteries.

MATERIAL AND METHODS:

The study had included the 50 adult human cadavers used for the routine dissection procedure. Total 50 hearts specimens were collected. The epicardium and fat were removed carefully from the surface of the heart. The origin and the course of all the coronary arteries and their important branches were carefully delineated. All were followed carefully to see any bridging myocardium running over the arteries. The specimens were numbered, length of the bridge measured by slide caliper. The Cunningham's manual of practical Anatomy is referred for the detailed dissection procedure. The approval of the Institutional Ethics Committee is taken for the present study. The information was collected and discussed in following sections.

RESULTS AND DISCUSSION:

Myocardial infarction has become the major killer for human race in modern times. Social factors,change of food habits, and sedentary life style has already increased the load on heart muscles addition of anatomical factors makes the heart more susceptible to ischaemia. Factors such as myocardial bridge are known for increasing cardiac load [9-11]. Hence present study was undertaken.

Myocardial branch length, depth and number are variables which may affect the nature of different ischaemic or arrhythmic pathological expressions of the heart. It must be understood that the presence of several long and deep MB can be the anatomical basis that facilitates the origin of clinical events such as angina, arrhythmias or even sudden death, which originate from situations of high demand on heart function, such as stress or exercise. The study revealed that most of the myocardial bridges were found over the posterior interventricular artery over both coronary arteries.

Occurrence of myocardial bridge more on left coronary artery observed in the present study may have been an incidental finding or may have a genetic reason. Calcium channel blockers, nitrates and anti platelet agents have also been used to reduce the incidence of angina with MB. Those who do not respond to medical therapy need surgical intervention. Previously surgical myotomy and coronary stenting these days are modalities of choice [12].

The high degree of variability of the coronary arteries and their branches must be carefully observed and studied from anatomical, pathophysiological, diagnostic and therapeutic viewpoints. Ethnicity is an interesting topic that must be carefully taken into account, especially in relation to the calibre of the coronary arteries. It appears that a relationship exists between body dimensions and this characteristic of the heart, although this suspicion must to be studied and validated in future works.

Currently myocardial bridges are an attractive and intriguing area of research. The clinical significance of myocardial bridges is uncertain and in the vast majority of cases, it remains clinically silent or acts a contributing factor in the devel opment of myocardial ischaemia, circulatory problems, angina, myocardial infarction, sudden cardiac death, systolic compression and other cardiac disturbances that may require surgical intervention[13]. Association of myocardial bridge with dominant left coronary artery pattern should increase the vulnerability of these hearts to more frequent and severe heart problems.

CONCLUSION:

Thus the precise knowledge of coronary arterial anatomy may provide

valuable information for the angiographers and cardiothoracic surgeons for an efficient management of coronary disease and other cardiac ailments. Association of myocardial bridge with dominant left coronary artery pattern should increase the vulnerability of these hearts to more frequent and severe heart problems. The Present study will be helpful for interventional cardiologists and radiologists for avoiding inadvertent vascular trauma during diagnostic and therapeutic procedures. Hence the knowledge of MBs is essential for cardiologists to detect etiology of different heart related problems, to plan the mode of treatment and to predict their prognosis.

Table 1: Myocardial Bridges Occurrence

Myocardial Bridges	Males	Females	Total
Right Coronary Artery	8	5	13
Left Coronary Artery	17	8	25
Both	0	0	0
Total	25	13	38

Table 2: Number of Single myocardial bridge over right coronary artery branches:

	Males	Females	Total
Right Marginal Branch	0	0	0
Proximal segment of RCA	3	3	6
Posterior Interventricular Branch	4	0	4

Table 3: Number of Single Myocardial Bridges over left coronary artery branches

	Males	Females	Total
Left anteriordescending Branch	9	0	9
Diagonal Branch	4	0	4
Left MarginalBranch	2	0	2
Circumflex Branch	0	0	0
Posteriorinterventricularbranch	11	2	113

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