

A Study of Myocardial Bridges on the Coronary Arteries

Cessy Job¹, Prasanna M.B.¹, Nandagopalan P.A.²

ABSTRACT

Introduction: Myocardial bridge is the muscle overlying the coronary arteries. Such an artery passing below it is called a Tunneled Artery. There has been a close association between the myocardial bridges on coronary arteries and the ischaemic heart diseases and cardiomyopathies. Aim of the study was to find out the proportion of myocardial bridges in human hearts.

Material and methods: Forty eight human hearts were collected from dissection hall of Government Medical College Kottayam, which were preserved in 10% formalin and dissected to expose the major coronary arteries and the myocardial bridges associated with them.

Result: 56.2% of the specimens have myocardial bridges (MB). MB was seen mostly on left coronary artery (43.7%) than the right coronary artery (21.4%).

Conclusion: The presence of myocardial bridges in such a high number is of importance in the Ischaemic Heart Disease. The knowledge of myocardial bridges is useful in the diagnosis, prevention and treatment of Ischaemic Heart Disease.

Keywords: Bridges, Coronary, Formalin, Ischaemia.

INTRODUCTION

Myocardial bridge was the muscle overlying the coronary arteries. Such an artery passing below it is called a Tunneled Artery. Myocardial bridging of coronary arteries were recognized and described by Black S.¹ Other authors^{2,3} and Polacek⁴ described these bridges as two forms, the muscular bridges and muscular loops. Tunneled Arteries have a segmental intra myocardial course. During systole, this segment of artery is compressed which is known as milking. They have a dynamic and phasic nature of obstruction different from fixed coronary stenosis. This may predispose to coronary thrombosis, atherosclerosis, myocardial infarction or sudden death.

Aim of the study is to find out the proportion of myocardial bridges in human hearts preserved in the dissection hall of department of Anatomy, Govt. Medical College Kottayam.

MATERIAL AND METHODS

Forty eight human hearts were collected from dissection hall of Government Medical College Kottayam, which were preserved in 10% formalin. They were dissected using the routine techniques to expose the course of major coronary arteries. The origin, course and branches of these vessels and the myocardial bridges associated with them were studied.

STATISTICAL ANALYSIS

Tables and graphs were made with the help of Microsoft office 2007. Descriptive statistics like mean and percentages were used to infer results.

RESULTS

48 heart specimens were studied by dissection technique, out of which myocardial bridges were observed in 27 specimens

(56.2%). The left anterior descending artery was involved in 21 cases (43.7%) (Figure-1). The middle segment was also involved in 9 cases (Figure-2). The proximal segment of this vessel was the most common site, 12 cases (Figure-3) (Table-1). The right coronary artery also showed myocardial bridges in 6 cases (21.4%) (Figure-4) (Graph-1). The myocardial bridges is a risk factor for certain surgical interventions like aortocoronary bypasses that affect the anterior interventricular artery, as the submerged portion of artery is only a few millimeters from right ventricle, which is at a risk of perforation during this surgical procedure.

DISCUSSION

It was noticed by Crains cianes² that a segment of left anterior descending artery had an intramyocardial course. In this study, LAD had an intra myocardial course. Geiringer³ observed in 23% the dipping of subepicardial coronary arteries into the myocardium for varying distance known as mural coronaria. This was seen to be 56.2% in our study.

Polacek⁴ described the most frequent location of myocardial bridges is left anterior descending artery especially in its proximal half (60%) and then in oblique branch of left coronary artery (18.5%) which was 25% and 18.75% in our study.

Bloor and Lawman⁵ conducted angiographic visualization of myocardial bridges Noble et al⁶ described the milking effect of myocardial bridges on coronary artery which might reduce the caliber to 75%, a basis for myocardial ischemia.

Fareequi et al⁷ reported two cases of symptomatic myocardial bridging having a milking effect on the vessel. Kramer et al⁸ noticed myocardial bridges in 12% cases of cineangiograms of normal persons.

Irvin and Charleston⁹ reported the prevalence of myocardial bridges in 7.5% to 9.7%, were anterior descending artery of left coronary was the most commonly involved vessel.

Schulle et al¹⁰ reported a case of 46% intramyocardial tunneling of LAD, without any clinical or morphological evidence of myocardial ischemia.

CONCLUSION

The presence of myocardial bridges in such a high number is of importance in the diagnosis, prevention & treatment of Ischaemic Heart Disease.

ACKNOWLEDGEMENT

Authors sincerely thank Dr. Raju Jacob Professor and Head,

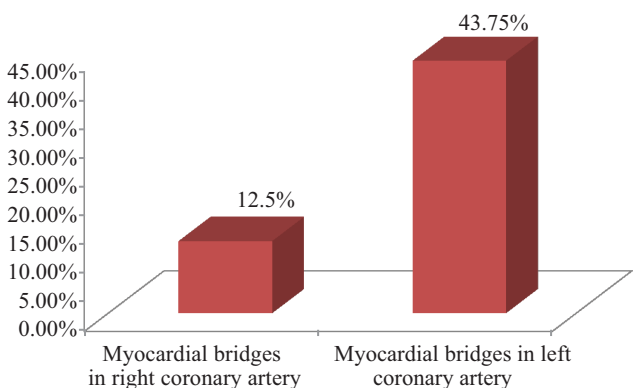
¹Additional Professor, Department of Anatomy, Government Medical College, Kottayam, ²Professor and HOD, Department of Anatomy, P.K. Das Institute of Medical Sciences, Ottapalam, Palakkad, India

Corresponding author: Dr. Cessy Job, Additional Professor of Anatomy, Govt. Medical College, Kottayam, India

How to cite this article: Cessy Job, Prasanna M.B., Nandagopalan P.A. A study of myocardial bridges on the coronary arteries. International Journal of Contemporary Medical Research 2016;3(6):1782-1783.

No. of Heart specimens studied	Myocardial bridges in right coronary artery	Percentage in right coronary artery	Myocardial bridges in left coronary artery	Percentage of MB in left coronary artery
48	6	12.5	21	43.75

Table-1: Percentage of Myocardial bridges on right and left coronary arteries



Graph-1: Percentage of myocardial bridges in coronary artery



Figure-1: Myocardial bridge over the left anterior descending artery; **Figure-2:** Myocardial bridge over the left anterior descending artery.

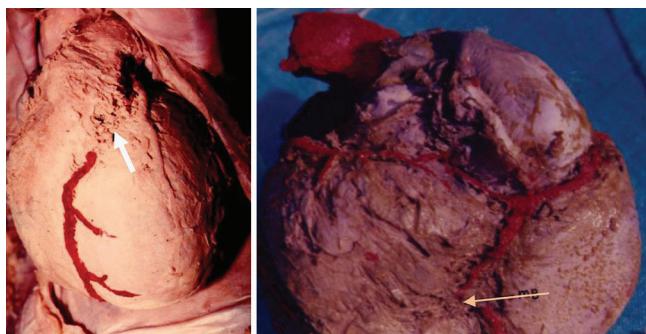


Figure-3: Mural coronary - The proximal part of anterior interventricular artery deeply buried in myocardium; **Figure-4:** Myocardial bridge over posterior interventricular branch of right coronary artery

Dept of Anatomy, Govt. Medical College, Kottayam for his constant support. Authors also acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors/editors/ publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

REFERENCES

1. Black S., 1805, A case of angina pectoris with a dissection. Memairs of the medical society of London. 6: 41. Cited by Kramer, J.R. Am, Heart J. 1982:103 (2).
2. Crainicianu, A. An atomische studies uber die coronararterien and experimentally under- suchgner uber ibre Druchganigkeit. Virch Arch path Anat. 1922;238:1.
3. Geiringer, E. The mural coronary artery. Am Heart J, 1951;41:359-368.

4. Polacek, P. Relation of myocardial bridges and loops on the coronary arteries to coronary occlusions. Am Heart J. 1961;61:44-52.
5. Bloor and Lowman R.M. Myocardial bridges in coronary angiography, Am Heart J. 1963;65:195-199.
6. Noble J., Bourassa, M.G. Petitclere R & Dyrdra, I. Artery. Normal variant or obstruction? Am J Cardiol. 1976;37:993-999.
7. Faruqui, A.M.A., Maloy, W.C., Felner, J.M. Schlant, R.C., Logan, W.D. & Symbas, P. Symptomatic myocardial bridging of coronary artery. Am J Cardiol. 1978;41:1305-1310.
8. Kramer, J.R., Kitazume, H., Proudfit & Sones, F.M. Significance of isolated coronary bridges – Benign and frequent condition involving LAD. Am Heart J. 1982;103: 283-288.
9. Irvin, R.G., & Charleston. Angiographic prevalence of myocardial bridging. Chest. 1982;81:198–202.
10. Shulte, M.A., Waller, B F., Hull, M.T. & Pless, J.E. Origin of the left anterior descending artery from the right aortic sinus with intramyocardial tunneling to the left side of heart via the ventricular septum: A case against clinical and morphologic significance of myocardial bridging. Am Heart J. 1985;110:499-501.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 29-04-2016; **Published online:** 30-05-2016