INTRODUCTION

Among all four valves in The human Heart, Mitral Valve connects Lt. Atrium with Lt. Ventricle. Mitral valve is described as consisting of continuous Sheet like structure attached around the entire circumference of the mitral orifice with its free edge bearing several deep grooves; two are deep enough and regular to be named as commissure. The cusps are named as anterior and posterior. The anterior cusp guards one-third of the circumference of the orifice and is semicircular or triangular, with few or no marginal indentations. The posterior cusp guards two-thirds of the circumference. Other small indentations divide the posterior cusp into a relatively large middle scallop and smaller anterolateral and postero medial commissural scallops. According to text (Gray’s Anatomy 39th Edition) mitral valve mean circumference is 9.0 cm in males; 7.2cm in females. Orifice is almost vertical in diastole and at 45° to the sagittal plane with slight forward tilt. Posterior cusp has 2/3rd of circumferential attachment. Study aimed to measure Mitral valve annulus circumference and height and length of valve cusps, useful database for prosthetic heart valve replacement surgeries and population differences in valve size can be easily observed.

MATERIAL AND METHODS

formalin fixed human hearts were studied, procured from cadavers in the Department of Anatomy MLNMC, Allahabad in 2016 Irrespective of sex and all the specimens were above 50 years of age. Ethical clearance was obtained from ethical committee of our institution. Hearts with any macroscopic abnormality, fibrosed and diseased, were excluded from our study. All the heart specimens were washed in running tap water to remove clots and blood from chambers of heart. Incision was given in 4 steps to visualise and measure mitral valve. Dissection steps are shown in (Fig-1). First step was incision in the left atrium around mitral valve annulus then incision was extended up to the apex of left ventricle and cavity opened up finally papillary muscles were divided near ventricular wall and cusps were also freed from their attachment along with mitral valve annulus and spread on black chart paper for proper measurement of length, height and annular circumference. Measurements were taken with the help of vernier calliper and thread.

STATISTICAL ANALYSIS

Microsoft office 2007 was used for the statistical analysis. Descriptive statistics like mean and percentages were used for the analysis.

RESULTS

In 5(9.61%) heart specimens we have found 3 cusps of mitral valve (Fig-2). Most common and widely accepted configuration for leaflet anatomy was the description provided by Carpentier (1976) described 3 posterior leaflet scallops with 2 clefts separating them, 2 commissures separating the anterior and posterior leaflet, and 1 anterior cleft. Any clefts that were found in regions described as being scalloped regions by the current nomenclature were termed “deviant” clefts. Our findings were based upon the above description, we have found 3 prominent indentations considering it as commissures as they were deep, having attached chordae from separate papillary muscles. Average circumference of Mitral Valve is 8.136 cm (Table-1) and average height of Anterior cusp and Posterior cusp is 2.034 and 1.012cms respectively (Table-2) in eastern uttar Pradesh population.

Conclusion: Average annular circumference is less in north Indians as compared to other population and average height of anterior and posterior cusps is almost matching with other populations.

Keywords: Mitral Valve Cusp, Anterior cusp, Posterior Cusp, Annular Circumference
DISCUSSION

During development of fetal heart mesenchymal cells of endocardial heart tube around the atrioventricular canals proliferate to form endocardial cushions. The ventricular surface of the cushions is excavated to form the atrioventricular valves attaching themselves to the ventricular wall via trabeculae. Atrioventricular valve leaflets were developing both from the endocardial cushion tissues and the myocardium. The leaflets and trabeculae of the atrioventricular valves was formed by separation of the innermost layers of the inlet part of ventricles. Victor and Nayak stated that the mitral valve apparatus is unique to each individual as one’s own fingerprints. Quill et al in 2009 proposed nomenclature system for cardiothoracic surgeons, dividing anterior and posterior leaflets into A1, A2, and A3 and P1, P2, and P3 scallops respectively via clefts. The cleft term was used for division between scallops on anterior and posterior leaflet. Hartynski et al reported a case with parachute like accessory mitral valve leaflet and tissue attaching to the anterior leaflet, ballooning into the subaortic ventricular septum associated with a discrete subaortic membrane causing stenosis. They gave emphasis upon intraoperative epicardial or transesophageal echocardiography for recognition of such defects. Rodrigo et al reported cases with double orifice mitral valve having each of the 2 mitral orifices inserting into fused papillary muscles. Average annular circumference of mitral valve was between 7-8 cms range in 71.15% hearts (Table-1). Average height and length of AC and PC was 2.034, 1.121 and 2.98, 4.02 cms respectively (Table-2).
while average length of Anterior cusp was 2.98 cms and height was 2.034cms Post. Cusps were having average height of 1.01cms and length of 1.21cms annular circumference was 8.136cms (table-1). In comparison with other studies our study closely matches with Study by Rusted et al\textsuperscript{12} (Table-2). Average annular circumference of mitral valve was between 7-8 cms range in 71.15% hearts(Table-1). Average height and length of AC and PC was 2.034,1.121 and 2.98,4.02 cms respectively (Table-2).

**CONCLUSION**

In our study we can infer that incidence of having extra cusp(5.96%) in north Indian population. We should keep these database in our mind before managing any patient with problems related to mitral valve compex. There are differences in morphometric details of north Indians as compared to other populations. Average annular circumference is less and max height of anterior and posterior cusps is matching with other population studies. We can use these data for mitral valve reconstructive surgeries and valve replacement surgeries.

**REFERENCES**


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