

COMPARISON BETWEEN THE ANTERIOR VENTRICULAR WALL THICKNESS, LEFT AND RIGHT, AND CONSIDERATIONS ON TRABECULAR SYSTEM OF THE TWO VENTRICLES

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ABSTRACT

In recent decades (late twentieth century), have been reported multiple anatomical variations in relation to the concepts described classic, so what once was described as an anatomical variant in some cases has become predominant, not quite often proposing a revision of international anatomical terminology.

This article is specifically addressed on the morphology of the papillary muscles of the two ventricles, describing the differences between the left and the right anterior ventricular walls.

Keywords: ventricular wall, trabecular system, anatomy, morphology

Introduction

In recent decades (late twentieth century), have been reported multiple anatomical variations in relation to the concepts described classic, so what once was described as an anatomical variant in some cases has become predominant, not quite often proposing a revision of international anatomical terminology (1,2,3,4,5). From this finding does not dispense any morphology of the ventricular walls, among which were made macro and microscopic clarifications on their structure, particularly contractil and embryonic myocard , on vascularisation and nerves, but also on atrioventricular valves , aortic and lung, the fleshy

trabeculae and tendon chordae, both structurally and in terms of their external morphology: form, morphometry, number. This article is specifically addressed on the morphology of the papillary muscles of the two ventricles, describing the differences between the left and the right anterior ventricular walls. To sustain my affirmations there are a large number of studies published in the last 2-3 decades in the literature as a necessity, because they performed multiple surgeries on the heart, requiring a good knowledge of the valvular system and papillary muscles involved in cardiac pathology (6,7,8,9,10,11).

Material and method

In my study, I used only the cords dissection, in most cases formalinized, analyzing ventricular wall thickness and trabecular system available on fleshy heart. Hearts were obtained from forensic laboratory in Constanta, at random, from adult subjects, whether patients were known to have died of heart disease or not and without specifying gender of the subject. After opening the ventricles, we studied the two ventricles wall thickness, trabecular system aspect as a whole in each ventricle and appearance of septomarginal trabeculae. The interior of the ventricular wall has been studied in the presence of the papillary muscles, and after removing them the results were compared with data in the literature that I had the opportunity to consult.

PERSONAL RESULTS AND DISCUSSION

Except in cases of right ventricular myocardial hypertrophy, in all cases anterior wall of the left ventricle was thicker than the corresponding wall of the right ventricle. On the third cranial wall thickness of between ventral we ventricle wall thickness ventral 28.57 to 40.0% of the left ventricle. Most commonly represent 35.48 to 38.19% of the wall thickness left. 1/3 medium at the right ventricular wall was less thicker, representing 33.33 to 46.9% in the anterior wall of the left, from 33.33 to 38.1% of the wall thickness left.

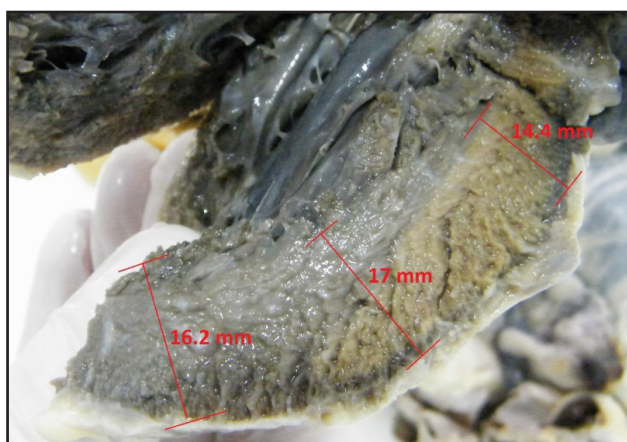


Figure 1. Anterior left ventricular wall thickness is greater than 2.6 mm in the middle third than 0.8 mm 1/3 cranial and caudal than 1/3; 1/3 1/3 bottom is thicker than 1.8 mm cranial; So is the thin cranial 1/3.

In the third caudal right anterior ventricular wall thickness is from 19.75 to 42.86% of the left ventricular wall, most often representing 40.0 to 42.86% of the left wall thickness.

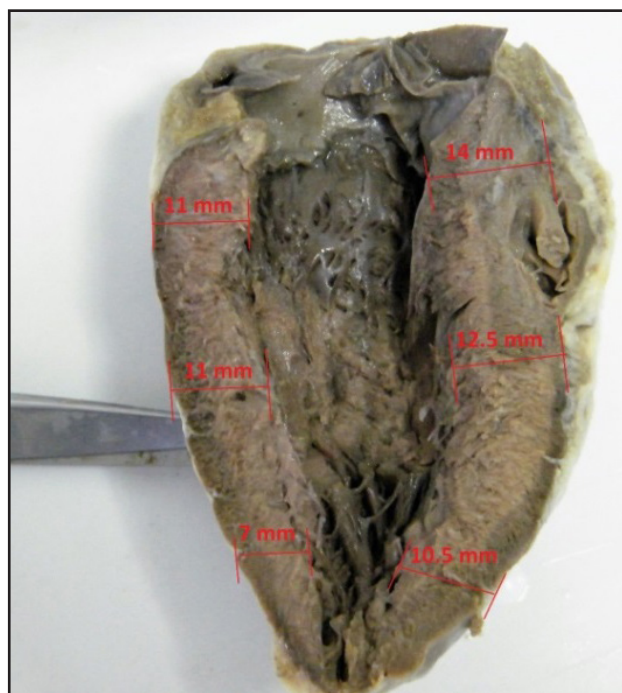


Figure 2. Left ventricular posterior wall thickness is 11 mm, 1/3 medium thickness equal to 3.0 mm and less than 1/3 cranial anterior wall; 1/3 medium posterior wall thickness is 11 mm greater than the thickness of 1/3 lower by 4.0 mm by 1.5 mm and less than 1/3 the thickness of the wall above medium; 1/3 tail thickness of the rear wall is 7.0 mm, 3.5 mm less than 1/3 the thickness of the wall above the tail.

We found that the thickness of the ventricular walls, the right ventricle and the left one, is not uniform and do not pose a gradual decrease from base to apex of the heart, and at the ventricular wall there is a difference in thickness between the anterior and posterior walls, the anterior one being thicker at all three levels measured with a difference of at least 0.8 mm and 4.0 mm maximum, most often the difference being 1.0 to 2.3 mm. I am also noting a representative thickness of the ventricular wall above the top of the left heart, and the muscle level that is thicker on ventricular wall as frequently, hence the smaller thickness difference at this level between the two ventricles. At level 1/3 and 1/3 middle cranial right ventricular wall thickness is most commonly, about one third of left ventricular wall thickness, as described in classical anatomy.

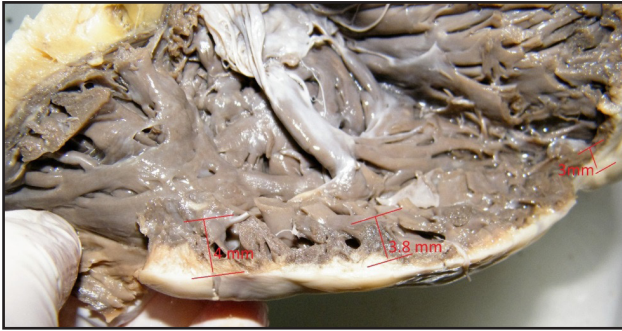


Figure 3. In the third cranial right ventricular wall is 4.0 mm, 0.2 mm thicker than the middle 1/3 and 1/3 caudal than 1.0 mm. 1/3 caudal ventricular wall is 0.8 mm thinner than the middle third. In the third cranial wall was 36.36% of the wall thickness in the middle 1/3 34.55% and 42.86% caudal 1/3.

Considerations on trabecular system of the two ventricles

Right ventricular fleshy trabeculae are less numerous than the left ventricle and less bulky. They are elongated, branched, anastomosed, transverse and oblique muscle short. Can be arranged parallel, they can interbreed, giving each chordae tendon, intertrabecular chordae or trabeculae between two close (short chordae) or between two trabeculae (chordae long). Some are divergent trabeculae (being joined at the base and cranial removed), others can be converged (large base and cranial area). Some trabeculae are arranged vertically or obliquely, others are transversely. Tendon chordae may exist frequently between neighboring trabeculae and papillary muscles, chordae, papillary trabeculae. Between trabeculae surrounding anastomosed or at a trabeculae can form spaces (holes), single or multiple, having various shapes: oval (most common), having the longest axis vertical or oblique, round or irregular, but smaller at the left ventricle. Near the base of the papillary muscles, thicker trabeculae can be found frequently with cylindrical basal portion. The trabeculae which are at the end of their upper side are mounted to the papillary muscle of the base, the other end being inserted in the wall of the ventricular trabeculae, papillary muscle trabeculae fleshy based on being able to insert between the two roots thereof.

Septomarginal trabeculae in its upper part

is smooth, uniform, showing the insertion of the medial septal papillary muscle chordae tendineae or in the form of objects, like a small muscle, most often cone papillary muscle of arterial showing reduced muscle cone size. Trabeculae at the bottom of the posterior papillary muscle detaches lower taper from falling off chordae tendon posterior tricuspid valve intended. The trabeculae septomarginalae chordae tendon becomes detached cylindrical bundles, including the cone artery, which branches off the valve tendon chordae, the trabeculae can be closer or nearer the valve. The bottom of the trabeculae septomarginal may have oblique transverse pin holes, the upper part of trabeculae, sometimes being smooth and uniform, showing the convexity and depression. Chordae tendon is detached from the trabeculae septomarginal area with pin holes and is inserted between the pin holes on them and even in their depth.

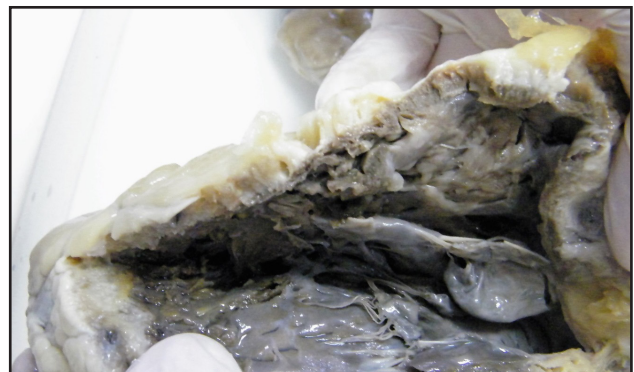


Figure 4. septomarginal trabeculae pin holes present on its surface oblique and vertical, between the chordae tendineae originating from some chordae or on the notch.

In the left ventricle, the ventricular wall of the trabecular system has a more complex organization than the right ventricle. Thus, the area corresponding to the papillary muscles of the ventricular wall presents a large number of fleshy trabeculae anastomosed with each other and bridged muscle and chordae tendineae. The root's base of the papillary muscles are connected by muscle bridges and shows insertion of fleshy trabecular adjoining these structures connected by chordae tendon trabeculae, adjacent or skip trabeculae linking to another trabeculae or a bridge muscle. Between the structures in the muscle (muscle trabeculae and bridges) and on the base of the papillary muscles is oval holes

delimiting a number of spherical or irregular. The lower insertion of papillary muscles shows the ventricular wall is thinner and rich fleshy branched and anastomosed, forming an areolar area, marking smaller holes. Sometimes, fleshy trabeculae can be stacked one above, passing (above the other) between trabeculae and between the edges of the holes there chordae tendon partitioning these spaces, and there the parietal trabeculae chordae tendon. This area is rich in parietal and multiple chordae tendon intertrabeculare, thinner.

Outside the papillary muscle, the ventricular wall presents on the surface area, at the bottom, fleshy trabeculae with variable shape, size and direction, strong anastomosed, sometimes can be stacked one above another, trabeculae passing nearby.



Fig. 5. The lower area of the left papillary muscle insertion presents fleshy trabeculae delimiting openings of different sizes, which give an aspect areola. Between trabeculae there chordae tendon partitioning the space. Based between the two papillary muscles, trabeculae there oblique muscle joined by bridges and fewer chordae tendon, delimiting holes. Above this area, between the papillary muscles, trabeculae surface is a fleshy muscle anastomosed decks that define oval and round hole of larger size, forming a structure similar to a net with large meshes.



Figure 6. In the zone of "gill net" is observed that the delimitation of the round or oval spaces is made by chordae tendon connecting trabeculae passing adjacent.

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