

## The Neurovascular Correlation of Myocardial Bridges with the Anterior Interventricular Branch

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The aim of this article consists in a concise presentation of the ramus interventricularis anterior (RIA) perivascular nerves distribution and their interrelations with myocardial bridges (MB). Our study was realized on 95 isolated formalized human hearts. The macroscopical study was carried out by thin anatomic preparation of the coronary vessels, under a binocular magnifier; at the macro-microscopic level we colored with Schiff's reagent the coronary vessels and the surrounding perivascular adipose tissue; microscopically were studied transverse cross-sections through the musculovascular complex colored with hematoxylin-eosin and with picrofuxin by van Gieson. Macroscopically MB were revealed in 62% of cases. They settled down on the course of RIA in 39%, along the first marginal branch of the left ventricle in 18%, and in a few cases on the distal thirds of the right coronary artery, on the course of the anterior right terminal ventricular branches and on the posterior interventricular branch. Considering the frequency of MB situated on the RIA and the possibility of the vessel systolic compression in the underbridged segment, we studied the variants of the perivascular arrangement of the nerves to determine their involvement under the MB, and the possibility of the eventual systolic compression. By coloring the total anatomic specimens with Schiff's reagent, we established non-uniform distribution and density of the perivascular nerves of the RIA. In the proximal third of the vessel were revealed a few, large, parallel nervous trunks with a minimum quantity of anastomoses between them; their arrangement mainly was superficial, that reduces to the minimum the opportunity of their involvement under the muscular bridge. In the middle third of the AIB the nervous network was well developed, formed by descendent nerve trunks and final branches coming from the posterior surface of the heart. The nervous structures in this region were situated at all levels of the fatty tissue that increases the opportunity of their involvement under the MB. In the distal third of the RIA was revealed a dense network of nerves that enters the myocardium together with blood vessels. These nerves form wide connections with the final branches from the diaphragmatic surface of the heart. In this case the opportunity of the arrangement of the nervous trunks under MB is quite great. On cross-section through MB and the vessel which it covers, a large number of perivascular nervous trunks were revealed, located between MB and vessel adventitial membrane. One of the methods of surgical treatment of symptomatic MB is their transversal myotomy at which realization it is necessary to consider an opportunity of hearts innervations impairments. The received information shows the possibility to be involved under the MB not only the vessels, but also nerves of different caliber that can lead to their systolic compression.

## The Obturatory Artery Correlation

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One of the basic lacks of applied methods of radiological research of vessels is their small informativity that can be caused by: 1) frequently poor-quality contrast of vessels therefore it is necessary to carry out repeated research; 2) some anatomic features of arteries (their tortuosity, deformation as a result of the atherosclerosis, etc.) in which result the contrast substance cannot fill

all departments of a vessel, as a result are necessary additional pictures in other projections. Proceeding from the aforesaid, we have made attempt to establish correlation of some morphometric parameters (length, diameter, and variant of origin) arteries of pelvis, including obturatory artery, with each other, and on their basis to deduce the formula for mathematical research of anatomic features of iliac arteries branches. Results of research have shown, that diameter of obturatory artery correlates with diameter of an anterior trunk of internal iliac artery ( $R=0,84$ ,  $p<0,05$ ). According to this the formula for modelling of a studied vessel is received:  $d = 0,07375 + 0,12500 * X1$ , where  $d$  - diameter of the obturatory artery;  $X1$  - diameter of the anterior trunk. Thus, results of research have shown authentic correlation of the morphometric parameters of obturatory artery with parameters of other artery of the pelvic region. The received mathematical formula can benefit in diagnostics of vascular system of the cavity of the pelvis.

## The Study of the Action of Physical and Chemical Factors on Microorganisms

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To research the influence of: the irradiation with ultraviolet (UV), the above- and over limit moderate temperatures, the environment's pH, as well as the combination of the above-mentioned factors on microorganisms, aiming the detection of the factor with the highest capacity of disinfection. We have collected air samples and isolated microorganisms from them. Then we've grown the microorganisms on Petri boxes. These Petri boxes were distributed in groups and subjected to different growing conditions (ultraviolet irradiation, action of different types of environment's pH, above- and over limit temperatures). After the incubation period, we have calculated the number and the percent of survived colonies as well as the disinfection capacity of each factor. This study showed that all the above mentioned factors, in some measure, affect the growth and development of microorganisms. UV radiation has a high capacity of disinfection. Even a short time influence (5 minutes) causes a significant decrease (28%) of the microorganisms number. Increasing the duration to 10 minutes, we didn't obtain meaningful results (efficiency increased by only 8%). In case we use UV irradiation for 15 minutes, we get an efficiency of about 64%. Above- and over limit moderate temperatures don't visibly affect the number of microorganisms (7% for low temperatures and 29% for high temperatures). Environmental acidity is a factor with a noticeable influence on the number of microorganisms. Both strong acidic pH ( $pH = 2$ ), as well as the strong basic pH ( $pH = 12$ ) cause an obvious decrease of the microorganisms number (equal to 54% and 66% respectively). Combining the high temperatures, the acid environment and ultraviolet irradiation for 15 minutes, we get an 85% result. Combining ultraviolet irradiation for 15 minutes, basic pH and low temperatures, the disinfection capacity decreases up to 64%. The method with the lowest efficiency is the action of over limit moderate temperatures. The best results on the disinfection capacity were obtained by combining physical and chemical factors. Each factor separately taken is unable to achieve such results.