

CHARACTERISTICS IN CARDIAC HYPERTROPHY

Faculty of Medicine, Transilvania University of Brașov, Romania

Cardiac hypertrophy represents the consequence of the cardiac insufficiency caused by certain types of cardiovascular diseases. The modifications that appear at the level of the cord as a consequence of the cardiac insufficiency shall be approached by different methods and techniques, according to the medical principles, which are determined by physiopathological mechanisms. In the context, we aim at associating the theoretic characteristics data for the purpose of observing the modifications in cardiac hypertrophy. The informations are used together with the standard pulmonary radiographies results, as a screening method of the cardiovascular disease.

Key words: cardiac failure, hypertrophy, myocardium, standard pneumonography

The term of cardiac insufficiency defines the incapacity of the cord to pump enough blood in order to meet all the necessities of the organism. From the physiopathological point of view it represents a consequence of certain cardiac diseases that determines the reduction of the pumping function of the heart. Usually the cause is represented by the decrease of the contractibility capacity of the myocardium, this representing the consequence of the blood coronary flux reduction. Furthermore, cardiac insufficiency may cause damages at the level of the cardiac valves, of the pericardial pressure, may cause primary diseases of the myocardium or other anomalies that determine the decrease of the heart pumping ability [8].

Taking into account the disproportionality between the arterial blood transport towards the periphery and the intravenous access, we distinguish the anterograde cardiac insufficiency and the retrograde cardiac insufficiency. In this context, the compensatory mechanisms are permanent, being found in the case of the cardiac hypertrophy and of the cardiac dilatation.

Cardiac hypertrophy is considered a compensatory mechanism, as it appears under conditions that tend to modify the functionality of the heart. It is located at the level of the cavities of the cord that suffer as a consequence of these psychopathological modifications and determine the recovery of the function of the cord, consequently to the occurrence.

Cardiac hypertrophy represents the mechanism through which the cord adapts to the increasing tasks, irrespective of the fact that these are caused by the increase of the pressure against which the myocardium must contract or irrespective of the increase of the cardiac flow.

The studies in the field reveal that hypertrophy may be caused by the contraction force of

the myocardium or by the fact that the main stimulus is represented by the increased muscular metabolic degree. Irrespective of the correctitude of the definition, we may determine an approximated calculus of the degree of the hypertrophy that shall occur at the level of each cardiac cavity, by the increase of the ventricular flow according to the pressure, against which the ventricle must contract, taking into account especially the pressure [7].

The hypertrophic cardiomyopathy was introduced as a term for the purpose of describing a myocardial anomaly, presenting a more or less defined etiology, which includes a number of different pathological states [5, 12].

The cardiac hypertrophy is classified in two types, the concentric and the eccentric one (fig. 1).

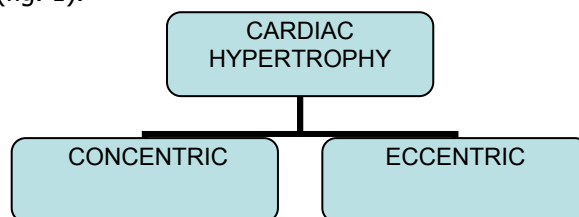


Figure 1 — Classification of cardiac hypertrophy

The concentric type of the cardiac hypertrophy was found in the case of the arterial hypertension or in the case of the aortic stenosis, upon the pressure request, accomplished by adding new sarcoma in parallel [6, 9].

The eccentric type is encountered in the case of the cardiac insufficiency, or in the case of the aortic insufficiency, upon the volume request, accomplished by adding new sarcoma in series.

The negative effects of the cardiac hypertrophy, in time, imply the increase of the necessary amount of oxygen without the production of

new capillaries, determining a disequilibrium of the oxygen between the request and the offer [1, 10]. In this manner, we determine the existence of the myocardial ischemia. This may be caused by the increase of the thickness of the ventricular wall, determining the decrease of the compliance, undertaking the pulmonary edema risk. The irreversible functional alternation leads to cardiac insufficiency. We noticed that in the case of the trained persons, the increased functional request leads to the hypertrophy of the heart, installed in parallel by producing new capillaries. The consequence of a phisiopathological mechanism represents the absence of the disequilibrium between the oxygen request and the demand [2, 4].

The medical aspects concerning the hypertrophic cardiomyopathy allowed the correlation of the different studies, the embryonal, bimolecular, enzymatic and imaging ones. From this point of view, certain researches are based on information concerning the regeneration of the liver and of the compensatory renal hypertrophy. Due to the resistance of the myocardium in case of fragmentation, it is more difficult for us to study it in comparison with the liver. In studying the myocardium, it is important to focus on the contractile proteins prevalence and on the decreased level of the structures that synthesize proteins [3, 11].

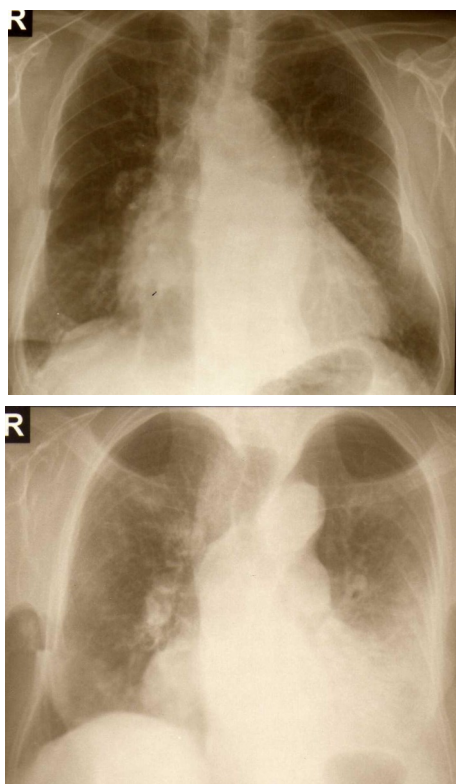


Figure 2 — Standard pulmonary radiography.
Cardiac stasis lung

to the diverse cardiovascular pathology which highly influences the human health, the correlation of the phisiopathological and imaging aspects provide an ample image of the study possibilities of the cardiac hypotrophy, as a consequence of the cardiac insufficiency.

The studies may complete each other with the imaging aspects on the standard pulmonary radiographies. The imaging method represents a screening method that may be successfully completed by clinical and paraclinical date and by therapeutic methods, for the correct treatment of the cardiovascular patients.

REFERENCES

- 1 Alberts B. *Molecular Biology of the Cell* // Garland Science. – 2008. – №2. – P. 43-47.
- 2 Bunu C. *Sistemul cardiovascular curs*, UMF Timișoara, accessible on-line at: <http://www.google.ro/>, 01 October, 2010
- 3 Diculescu I. *Histologie Medicală /I. Diculescu, D. Onicescu.* – Bucharest: Medical Publishing House, 1987. – V. I. – P. 288-540.
- 4 Decun M., Bodnariu A. *An analysis of animal testing in Romania /M. Decun, A. Bodnariu.* – Bucharest: Medical Publishing House, 1997. – V. II. – P. 288-540.
- 5 Karthikeyan D. *Fundamentele Radiologiei Toracice /D. Karthikeyan, D. Chegu.* – Bucharest: Callisto Medical Publishing House, 2009.— 280 p.
- 6 Guyton A. C. *Circulatory Physiology, Cardiac Output and its Regulation /A. C. Guyton, C. E. Jones, T. G. Coleman.* – Philadelphia:W.B. Saunders Co, 1973. – 324 p.
- 7 Guyton A. C. *Arterial Pressure and Hypertension.* – Philadelphia: W.B. Saunders Co., 1980. – 366 p.
- 8 Guyton H. *Traktat de fiziologie a omului.* – Bucharest: Callisto Medical Publishing House, 2007. – 456 p.
- 9 Sadler T. W. *Embriologie Medicală.* – Bucharest: Callisto Medical Publishing House, 2007. – 208 p.
- 10 Tsai A. G. *Oxygen gradients in the microcirculation /A. G. Tsai, P. C. Johnson, M. Intaglietta //Physiol. Rew.* – 2003. – V. 83. – P. 933.
- 11 Yellon D. M. *Preconditioning the myocardium from cellular physiology to clinical cardiology /D. M. Yellon, J. M. Downey //Physiol. Rew.* – 2003. – V. 84. – P. 1113.
- 12 Yoerger D. M. *Hypertrophic obstructive cardiomyopathy – mechanism of obstructive and response to therapy /D. M. Yoerger, A. E. Weyman //Rew. Cardiovasc. Med.* – 2003. – V. 4. – P. 199.

Received 30.04.2014

Лекции

А. Ческа

ЖҮРЕК ГИПЕРТРОФИЯСЫ КЕЗІНДЕГІ ФИЗИОПАТОЛОГИЯЛЫҚ СИПАТТАМАЛАР

Жүрек гипертрофиясы жүрек-тамыр ауруларының белгілі бір түрлерінен туындайтын жүрек жеткіліксіздігі салдарынан пайда болады. Жүрек жеткіліксіздігі салдарынан туындайтын өзгерістер медициналық қағидаларға сәйкес әртүрлі тәсілдермен және әдістермен зерделенуге тиісті, олар физиопатологиялық механизмдармен анықталады. Мақала авторы адам ағзасында жүрек гипертрофиясы кезінде орын алатын өзгерістерді зерттеу мақсатында теориялық мәліметтерді біріктіруге ұмтылған. Автор алынған мәліметтерді жүрек-тамыр аурулары кезінде скрининг әдісі ретінде өкпені зерттеудің стандартты рентгенографиялық әдістері нәтижелерімен бірге қолданған.

Кілт сөздер: жүрек жеткіліксіздігі, гипертрофия, миокард, өкпенің стандартты рентгенографиясы

А. Ческа

ФИЗИОПАТОЛОГИЧЕСКИЕ ХАРАКТЕРИСТИКИ ПРИ ГИПЕРТРОФИИ СЕРДЦА

Сердечная гипертрофия возникает вследствие сердечной недостаточности, вызванной определенными типами сердечно-сосудистых заболеваний. Изменения, возникающие вследствие сердечной недостаточности, должны быть изучены различными способами и методами в соответствии с медицинскими принципами, которые определяются физиопатологическими механизмами. Автор статьи сделал попытку объединить теоретические данные с целью изучения изменений, происходящих в организме при сердечной гипертрофии. Полученные данные используются автором вместе с результатами стандартных рентгенографических методов исследования легких, в качестве метода скрининга при сердечно-сосудистых заболеваниях.

Ключевые слова: сердечная недостаточность, гипертрофия, миокард, стандартная рентгенография легких