

Myocardial perfusion estimation with help of scintigraphic images

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Abstract – This work describes a method of assessing myocardial perfusion. Processed scintigraphic images were obtained as a result of the planar (2D) study of the heart. The algorithm was offered for treatment of local areas of scintigraphic images.

Keywords – scintigraphy, myocardium, heart.

I. INTRODUCTION

Myocardologic scintigraphy (MSG) has great popularity among the diagnostic methods of the heart. This is due, primarily, with broad functionality, high sensitivity, non-invasive, low radiation exposure to patients, as compared with other methods. MSG allows exploring myocardial perfusion, which makes it possible to detect the disease at early stage, to assess the severity of the pathological process, to predict disease progression.

The problem of correct recognition is one of the most important aspects of the production of reliable diagnosis, thereby, there are various methods of processing the obtained images.

II. MAIN PART

The principle of MSG is that the radiopharmaceutical (RP) introduced into the body, accumulates in the myocardium in proportion to the volume of coronary blood flow. [1] Further, the gamma camera captures the radiation of the RP in the heart, as a result, we take a scintigraphic images that reflect the functional state of myocardium in the respective area of coronary lesions. These images carry information not only about the total accumulation of RP in the myocardium, but also provide an opportunity to assess the accumulation of the drug quantity.

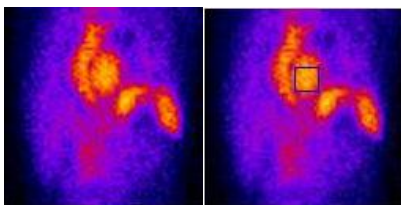


Fig.1 The planar scintigraphic images

In study (investigation) is important to synchronize images with the electrocardiograph. This is due to the fact that the heart is a dynamic object, and in the diagnostic is important that the resulting images were compatible, that is performed in certain phases of cardiac cycle.

Several authors [2] mention the possibility of observing activity curves of myocardial scintigrams, which made at different times, but at the same phase of the cardiac cycle. There were regions of interest with permanent location and its changes, fixed on each image.

Based on this method numerical experiments were performed in Matlab [3], to research the activity of the heart muscle.

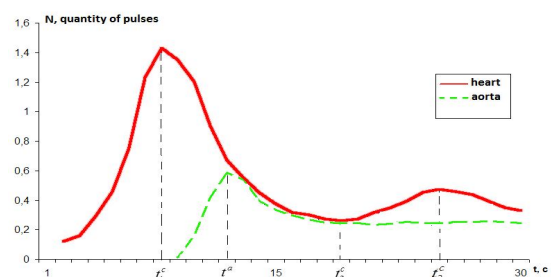


Fig.2 Standard curves of activity

Region of interest [3] was selected on the scintigraphic images (Fig. 1). The curve of activity, which is similar to a standard curve, was constructed by the total intensity on images (Fig. 2,3).

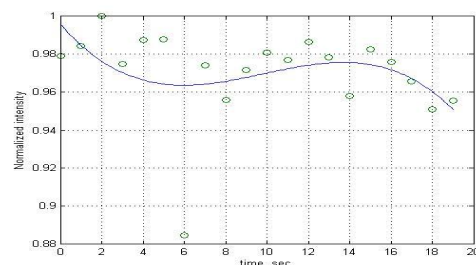


Fig.3. Curve of distribution RP in the local area to the total intensity during the time

III. CONCLUSION

The proposed algorithm of processing scintigraphic images of the myocardium can improve the accuracy of plotting activity through synchronization images with the cardiac cycle, and the choice of local areas to required size.

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