Multi-Detector Row Computed Tomography Angiography of the Aorta

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The multi-detector row computed tomography angiography (MDCTA) is nowadays the method of choice for the assessment of aortic pathology, thanks to its multiplanar capacity, availability and efficacy.

Frequently, the symptomatology of patients with acute aortic syndrome is not clear enough, and may look as other types of thoracic pathology. Therefore, an imaging method which allows the assessment not only of the aorta but also other thoracic structures, and even abdominals, in a relatively short period is required.

As an example we can mention the “Triple Rule-Out” where, in only one CT scanning, it is possible to assess pulmonary vascular, aortic and coronary areas, in addition to pulmonary parenchyma and chest wall.

In the decade of the nineties and with the development of the helical CT it was possible to obtain continue images while the patient was moving along Z axis. During the following decade, monodetectors scanners were gradually replaced by multi-row scanners (MDCTA).

The result was images with greater temporal resolution, less noise and better spatial resolution in Z axis. This latter factor made possible the production of multiplanar images of high quality that may have important clinical relevance.

The recent increase in the availability of the MDCTA of 64 or up to 320 detectors, not only made possible the reduction of the study’s time but also an increase in the spatial resolution, comparable with the conventional angiography was achieved. On the other hand, as the quantity of detectors was increasing, the amount of intravenous contrast administered was reduced, which allows the performance of a conventional angiography, if it is necessary to use interventional procedures to repair the vascular lesion found.

The potential carcinogenic effect of the MDCTA should be considered, especially in young women. In a recent study where MDCTA in the diagnosis of pulmonary thromboembolism was used, it was calculated that the minimal radiation to the breast tissue in a 60-kg woman was of 20 mGy in each breast. This is equivalent to 10-25 mammographies or to 100-400 thorax radiographies.

Each study should be properly registered, so that an adequate balance of the risk/benefit equation is achieved in order to have adequate and enough information depending on the clinical case.

While in the last years it was possible to improve the speed and the temporal and spatial resolution, nowadays the different manufacturers of these equipments are focused on the application of several technological methods in order to reduce the patient’s total radiation.

In this issue of the Journal, Cerda et al. revised their experience with MDCTA in aortic pathology.

In this interesting article, its authors used a 64-channel equipment and did multiplanar and three-dimensional reconstructions in a workstation.

A very important aspect, in my opinion, is that in the section of methods they describe the use of the electrocardiogram gated technique in order to eliminate motion devices in the root of the aorta.

This is an important technical detail, since despite there is an increase in the patient’s radiation, it may be a crucial element to avoid false positives in patients with suspected aorta dissection. This is an example of how the obtained benefits exceed the corresponding risk.

Authors classified their cause in three clinical applications: dilatation, acute aortic syndromes and stenosing pathology. Each section starts with the description of a particular entity, emphasizing in the important points in order to identify each of them. Images are of good quality; they involve a wide range of aortic pathology and illustrate the important points of each entity.

Cerda et al. article may be useful as a general guide in the practical applications of MDCTA in aortic pathology, but it would be also interesting to further the study in order to account for the applications of the technique, detailing advantages and disadvantages in comparison with other diagnostic methods.

Undoubtedly, the quality of the images and the clinical treatment puts Favaloro’s Foundation at the same level of the best imaging centers in the world.

BIBLIOGRAPHY


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