

## Reflections

*Reflexões*

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The planning of the imaging investigation strategy should be aimed at elucidating the doubts of the requesting physician in the fastest, safest and most accurate manner, with a favorable cost-effectiveness ratio. The sole beneficiary of such an investigation must be the patient himself, and perhaps, indirectly, his doctor whose doubt is elucidated.

Whenever there is more than one appropriate diagnostic imaging method for the analysis of a given structure, the choice of one method rather than another must be solely based on the relative effectiveness of such methods in clarifying that specific diagnostic doubt.

Currently, the role of the imaging-specialist physician is undergoing a transformation from being a mere specialist in the acquisition and analysis of diagnostic images to becoming a consultant physician, with an ever increasing active participation in the choice of the best diagnostic algorithm for the investigation of the patient. At such a moment, the physician's opinion must be completely technical and impartial, devoid of any interest other than the patient's well being. Unfortunately, consciously or not, at times we allow privileges and prejudices to contaminate such a decision. That becomes more noticeable as different diagnostic modalities are under the responsibility of different medical specialties. Many times such a decision contaminated by second interests is intentional and abominable. Other times, the decision is affected by the absence of adequate knowledge on the methods utilized by other specialties, i.e., we choose the method we are more familiar with. Although less reprehensible, it is not justifiable either.

We are human beings. It is notoriously difficult to make such a decision in a totally impartial manner. Such a bias is also present in scientific publications, with a tendency towards a larger number of articles whose authors appreciate the methods which they are directly involved with.

Having said that, it was a pleasant surprise to read the article by Metzger and colleagues on the present issue of **Radiologia**

**Brasileira**, analyzing the role of preoperative computed tomography angiography only or in association with conventional angiography (AG) in the endovascular treatment of aortic diseases<sup>(1)</sup>. In a quite brave manner, the study demonstrates that preoperative AG did not change the analyzed outcomes, concluding that it should be utilized only in those cases where computed tomography angiography cannot provide all required data for the planning of the therapeutic intervention, or in cases where anatomical adversities hinder the desired treatment objective.

Radiologists specialized in computed tomography angiography and cardiovascular imaging have a clear notion on how robust this tool is in the evaluation of aortic diseases. Thus, the fact that there was little impact in the concomitant performance of AG and computed tomography angiography in aortic diseases was not a surprise. However, a more careful reading of the article does reveal some surprises.

For the more observant reader, it is interesting to point out what the article does not explicitly show: the suggestion that in spite of the notable progress of computed tomography angiography, in specific situations AG can contribute with valuable additional diagnostic information. Much emphasis has been given to AG as a therapeutic tool, but from the diagnostic point of view AG has been relegated to a secondary position as a tool of little help in the decision making process. In the mentioned study, there are two interesting findings with borderline statistical significance, perhaps because of the small-sized study population. Both findings were observed in the subgroup where the thoracic aorta was evaluated.

The first finding is the greater number of complications in the subgroup where conventional AG + computed tomography were not utilized, with some of such complications being very severe (two cases of paraplegia and one death). A part of those complications is explained by the known superiority of conventional AG for the study of the spinal arteries<sup>(2)</sup>. The second finding is the higher accuracy in the prosthesis calculation in the subgroup submitted to preoperative conventional AG, demonstrating that it can be a useful resource for a better surgical planning. Differently from the first finding, such a fact may be surprising to most colleagues used

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to report computed tomography angiography exams in their daily routines, who certainly consider CT tomography angiography superior to conventional AG in what concerns the accuracy of vascular measurements.

However, a source of common errors at CT angiography has been highlighted in recent publications: inaccuracies in vascular measurements at different moments of the cardiac cycle, a limitation that does not exist at conventional AG.

The evaluation of the aorta by means of CT angiography has been routinely carried out in studies without electrocardiographic (ECG) synchronization, with the presence of artifacts related to the cardiac motion degrading the proximal ascending aorta images and impairing an accurate measurement. With the introduction of faster computed tomography scanner, and the possibility of synchronizing the data acquisition with ECG, many centers have adopted such protocol, for example, in preoperative evaluation for percutaneous implantation of aortic valvular prostheses. Generally, the selected image is that obtained at end-diastole, which is the moment of the cardiac cycle where there is less motion, and therefore fewer artifacts.

However, several studies have demonstrated that the measurement should be performed at the end systole, with significant differences in the measurements obtained at different moments

of the cardiac cycle, which might lead to errors in the calculation of the prosthesis<sup>(3,4)</sup>. Other studies demonstrate that such error is not restricted to the proximal aorta, also occurring along the descending thoracic aorta<sup>(5)</sup>.

This shows us how vast and full of nuance the art of radiology is. Well established concepts must be revised from time to time, especially those which are based on intuition and apparent common sense. Certainly we will have interesting surprises, particularly from scientists committed with the truth, such as Metzger and his colleagues.

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