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EDITORIAL

Can we further examine patients without perfusion imaging?

We are all familiar with two-dimensional and even three-dimensional morphological imaging, used in CT scans as well as MRI. With the rise of rapid imaging, it is possible to add a fourth dimension: time! Today, the CT scan and dynamic MRI make it possible to follow the time variations of the image induced by the passage of a contrast medium to characterize tissue perfusion.

The most common contrast media, such as iodine in CT scans and gadolinium in MRI, are injected via the intravenous route. They can simply transit through the vessels or infuse the extravascular space of the organs. This behaviour makes it possible to characterize tissue vascularization and to identify potential abnormalities. With the functional imaging of the perfusion, it is even possible to detect changes in the functional properties of the vascularization. This information provides diagnostic evidence that is now taken into account to treat patients.

Currently, most installed CT scan and MRI machines have the tools necessary for acquiring and analysing the images. The manufacturers provide efficient software programs that provide maps of results that can be interpreted directly and exported easily.

This issue presents you with the main applications of perfusion imaging in routine clinical practice. Nevertheless, precious methodology reminders provide details regarding the advantages and limits of the primary techniques.

The authors of this issue regularly work with methodologists and manufacturers to develop techniques and make them useful in a clinical context, and speak with physiologists, anatomical pathologists and clinical practitioners to better interpret the results and to develop the applications. These articles are the summary of their work and their know-how to provide you with useful knowledge for the treatment of your patients.

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With perfusion imaging, you will learn to identify small tumours, distinguish between benign tumours and malignant tumours in the brain, salivary glands, liver, kidneys, breast, prostate, uterus and annexes, and distinguish a tumour relapse from a post-radiation fibrosis. With functional perfusion imaging, you will also know how to justify an endovascular treatment, by showing the damage to cardiac or brain tissue downstream from an obstacle in the artery.

Perfusion imaging is now well-established, while offering perspectives on a new diagnostic territory that has yet to be conquered.

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