

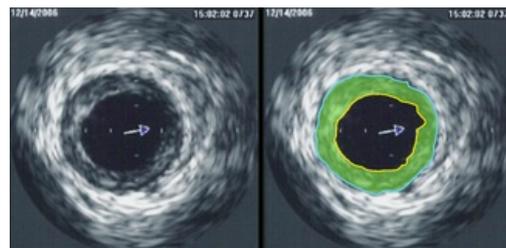
Intravascular ultrasound

Intravascular ultrasound (IVUS) is an imaging method for examining the lumen and vessel walls. It is used mainly in cardiology for coronary arteries. It enables the evaluation of the size of arteries, the width of their lumens and the character of atheroma plaques in cross-section and longitudinal sections. In addition to angiography, it is a helpful method that can sometimes better assess the **size of the lesion** and its **relationship to the receding branches**. Computer three-dimensional reconstruction is also possible.

IVUS is a mini-invasive method using a **miniaturized probe** smaller than 1 mm with a **frequency of 10-40 MHz**. In invasive cardiology, **30 MHz** probes are usually used. By performing this ultrasound examination, it resembles coronary angioplasty. The ultrasound catheter is inserted according to the conductor to the periphery of the artery being examined.

It is mainly used for the **evaluation of angiologically unclear lesions**, estimation of the hemodynamic significance of stenosis, management of intracoronary interventions and **diagnosis of complications**. Among other things, the examination makes it possible to evaluate the **regression of atherosclerotic plaques** after hypolipidemic treatment, where it is more advantageous than angiography.

Data obtained from IVUS can also be used for so-called virtual histology, which is based on detailed computer analysis of the tissue signal. In principle, two approaches are possible, either the radio frequency signal is analyzed, ie the high-frequency signal directly from the detector, or the resulting image is analyzed. Information about the probable histology of the tissue is colour-coded into the resulting image, ie fibrous tissue green, fibrolipid yellow-green, calcification white, necrosis red and media grey can be highlighted. However, this view has numerous technical limitations and should be taken with caution.



Intravascular ultrasound image of a coronary artery (left), with color coding on the right, delineating the lumen (yellow), external elastic membrane (blue) and the atherosclerotic plaque burden (green).

References

Related Articles

- Interventional radiology
- Ultrasound
- Atherosclerotic plaque

Sources

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