

V/Q SPECT-Imaging versus CTA for Pulmonary Thrombo-Embolism

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The pathophysiological process that lies behind pulmonary thrombo-embolism (PTE) is much more complicated than the simple blocking of a vessel by a clot might appear. The obstruction of a vessel by an embolus leads to the release of vasoactive substances like prostanooids and serotonin, which significantly contribute to the impairment of parenchymal perfusion. Hence, what we have to look for in PTE diagnosis are true positive parenchymal perfusion defects induced by arterial occlusion and not by bronchial obstruction. This is the classical task of V/Q-Imaging. It is very straightforward with the combination of ventilation/perfusion SPECT-studies using Technegas. The reason for using Technegas in this context is that true ventilation images can be acquired. By contrast with Krypton-studies (which are also much more expensive and not readily available), Technegas deposited in the lung generates a "frozen" image. Thus, SPECT acquisition is possible, followed by the classical MAA-image. These images can be clearly interpreted as Fig. A shows. No images with "intermediate probabilities" will be produced. The diagnosis of PTE in Fig. A is very clear.

Whilst many Radiologists will argue that CTA is now the method of choice, one should recognise that employing this diagnostic tool properly is not as easy as it might seem. The Radiologist has to search for defects within the flow of contrast medium. Many images need to be interpreted carefully and in context.

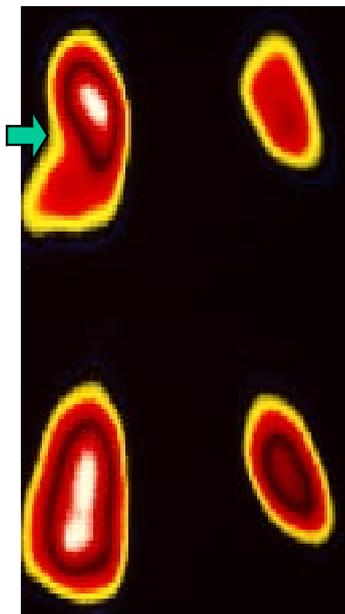
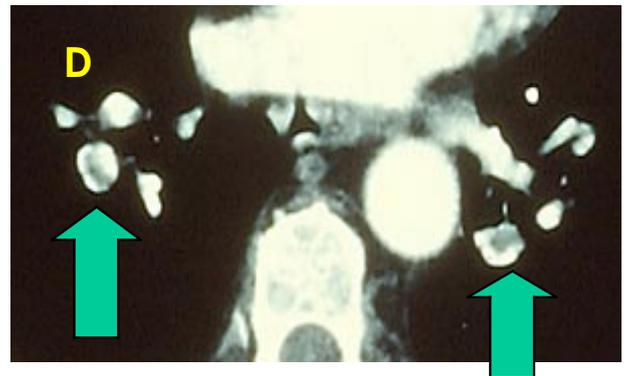
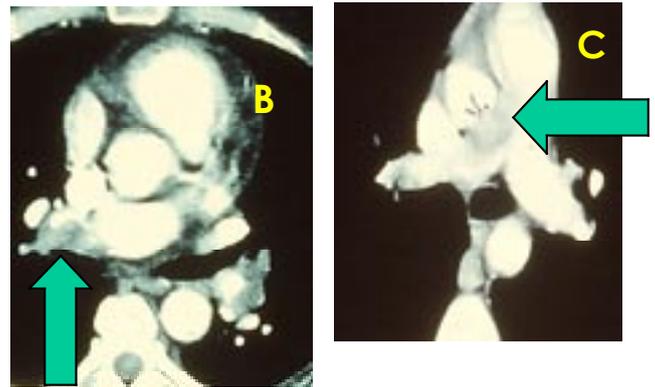


Fig. B shows a defect, induced by a benign tumour, fig. C shows perihilar lymphomas. In Fig. D however, thrombo-embolic clots can be detected.



Performing V/Q-SPECT-imaging using Technegas however, gives a clear insight into the basic pathophysiology of PTE. Even sub-segmental PTE will be detected clearly.

Reference

M. Lemb, H. Pohlabein. Pulmonary thromboembolism: a retrospective study on the examination of 991 patients by ventilation/perfusion SPECT using Technegas. Nuklearmedizin 2001; 40: 179-86