Value of contrast-enhanced MRA of the peripheral arteries at 3T: Results of a large European multicenter trial comparing gadoterate meglumine-MRA to gadobutrol-MRA with DSA

Michael Lell[1], Javier Arnaiz[2], Denis Krause[3], Luis Marti-Bonmati[4], Manuela Aschauer[5], Armando Tartaro[6], Massimo Lombardi[7], Marta Burrel[8], Reynald Izzillo[9], and Christian Loewe[10]

[1]Radiology Department, University-Hospital, Erlangen, Germany, [2]University Hospital Marquès de Valdecilla, Santander, Spain, [3]Département de Radiologie et d'Imagerie Médicale Diagnostique et Thérapeutique, CHU Le Bocage, Dijon, France, Metropolitan, [4]Dr Peset Hospital, Valencia, Spain, [5]Radiology, Universitätsklinikum für Radiologie, Graz, Austria, [6]University Gabriel d'Annuzio of Chieti-Pescara, Chieti, Italy, [7]Clinical Physiology Institute CNR National Research Council, Pisa, Italy, [8]Hospital Clinico, Barcelona, Spain, [9]Radiology, Centre Cardiologique du Nord, Saint Denis, France, [10]Radiology, AKH Wien - Medizinische Universität Wien, Vienna, Austria

Purpose: The feasibility of peripheral contrast-enhanced MR angiography (CE-MRA) at 3T has already been described in some studies [1,2]. However, to date, no prospective randomized trial comparing peripheral CE-MRA at 3T to the reference standard DSA has been performed so far including a large patient population. Therefore, the aim of this multicenter trial was to assess the value of contrast-enhanced MRA at 3T for diagnosis and treatment planning in peripheral arterial occlusive disease (PAOD).

Methods: This multicentre trial including 189 patients was primarily aimed to compare the degrees of agreement in stenosis detection between contrast enhanced-MRA and DSA using gadoterate meglumine (Dotarem®) or gadobutrol (Gadovist®). Parameters related to stenosis detection and grading, specificity, sensitivity, positive/negative predictive values calculation, factors important for treatment planning and patient outcome were investigated. These factors included diagnostic confidence, stenosis length, and vessel diameter. Additionally, signal/contrast to noise ratios (SNR/CNR) were calculated. Image data from 156 evaluable patients (per protocol population) were assessed by two independent readers in a centralized reading.

Results: The patient management (angioplasty 64% vs 51%, surgery 23% vs 26%), diagnostic confidence (86.3% vs 86.2%), stenosis length and vessel diameters were similar in both groups. The global mean stenosis length was 54.26 mm, and 5.32 mm for normal diameter, 1.49 mm for narrowest diameter. Both contrast agents were well tolerated.

Discussion: Contrast materials with higher T1 relaxivity have been proposed to be advantageous. However, the present study demonstrated the lack of any relevant difference in the diagnostic confidence in assessing PAOD patients at 3T between two contrast agents with different gd-concentrations and different T1 relaxation times.

Conclusion: This study demonstrates the value of peripheral MRA at 3T for diagnosis and treatment planning in patients suffering from PAOD without any difference between gadoterate meglumine-MRA and gadobutrol-MRA.

References:

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