Bilateral four Channel Phased Array Carotid Coil from Machnet

Company Description

Machnet BV is one of the few suppliers who develop and produce special MRI Coils. We design, manufacture and market specialty coils for MRI all around the globe.

Our main office is in Eelde, The Netherlands. For more information or questions, please contact our Sales Department
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Introduction

The Phased Array Carotid Coil is a flex coil. The assembly is coated with a soft polymer foam to minimize patient discomfort. The flexibility of the coil enables it to be positioned on both sides of the neck and held in place with a soft collar.

The bilateral 4-channel phased array coil is designed for bilateral proton imaging of the carotids, and allows for sub-millimeter resolution of the carotid lumen, the vessel walls and atherosclerotic plaques. Due to its inherent contrast resolution, MRI has the potential to provide a surplus of information on the composition of the atherosclerotic plaque.

The coil provides high-resolution images with good definition of the lumen and the vessel walls, without disturbance from flow artifacts.

Note: even though the coil wasn't developed for such purposes, it has to be used to scan baby hearts because of the high-resolution and the penetration depth (Fig.5).

Technique

The Phased Array Carotids Coil is compatible with the MAGNETOM Symphony and the MAGNETOM Sonata 1.5T MAGNETOM scanners. All the images in this article were produced with these two types of scanners.

Magnetic resonance imaging of the carotid artery wall and in particular of carotid artery atherosclerosis, has the potential to identify patients at risk of cerebrovascular events. Magnetic resonance imaging has the ability to identify lipid and fibrotic components of complex atherosclerosis, which are important determinants for risk of complications in the coronary circulation and – some evidence suggests - the carotid circulation also. What is required is high resolution black blood imaging, with an in-plane resolution of at least 0.5x0.5 mm.

Clinical Images

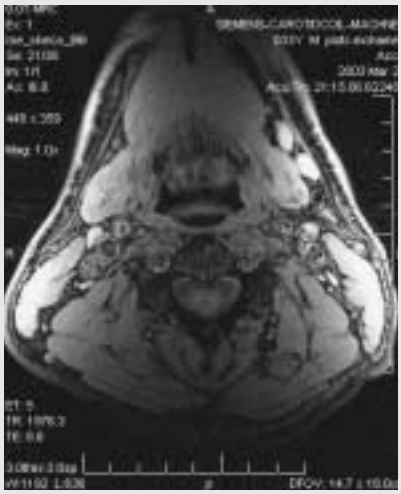

Figure 1 *Image courtesy of Aad van der Lugt, MD, PhD, Mohamed Ouhlous, MD, Piotr Wielopolski, MD Erasmus Medical Center-Daniel den Hoed, Rotterdam.*

Aquisition parameters:
TR 1976.3ms, TE = 8.6 ms.
FOV = 147 x 180 mm, 448x359,
3 mm slice thickness.

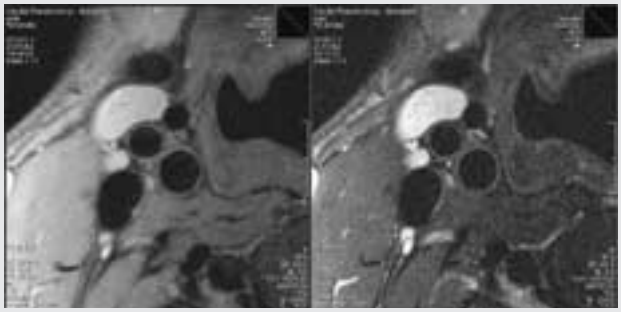

Figure 2 *Image was performed with MAGNETOM Sonata 1.5T Scanner. Image courtesy of Aad van der Lugt, MD, PhD, Mohamed Ouhlous, MD, Piotr Wielopolski, MD, Erasmus Medical Center-Daniel den Hoed, Rotterdam*

Aquisition parameters left image:
TR 2234.8 ms, TE = 16.0 ms. FOV = 103x120 mm, 440x512, 3 mm slice thickness.
Aquisition parameters right image:
TR 2260.5 ms, TE = 64.0 ms. FOV = 103x120 mm, 440x512, 3 mm slice thickness.

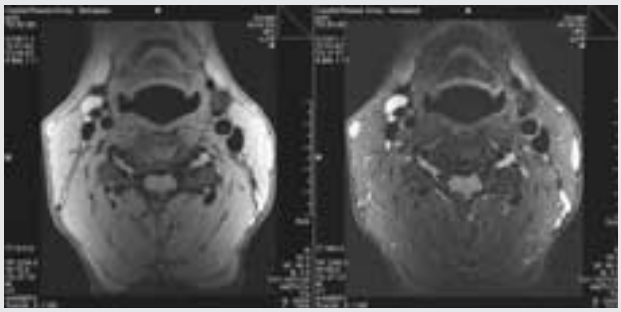

Figure 3 *Image was performed with MAGNETOM Sonata 1.5 T Scanner. Image courtesy of Aad van der Lugt, MD, PhD, Mohamed Ouhlous, MD, Piotr Wielopolski, MD, Erasmus Medical Center-Daniel den Hoed, Rotterdam.*

Aquistion parameters left image:
TR 2234.8ms, TE = 16.0ms. FOV = 103x120 mm, 440x512, 3 mm slice thickness.

Aquisition parameters right image:
TR 2260.5ms, TE = 64.0ms. FOV = 103x120 mm, 440x512, 3 mm slice thickness.

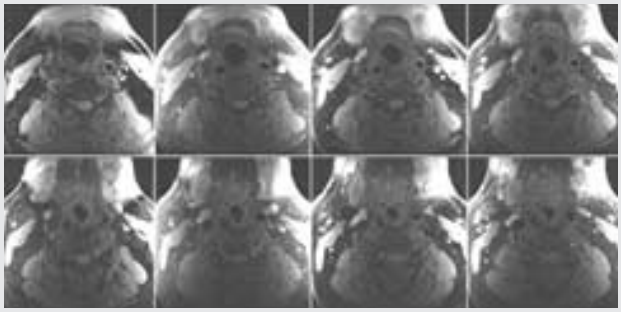

Figure 4 *Images of a 55 year old patient with carotid plaques. Image courtesy of Dr. Zahi A. Fayad, Imaging Science Laboratories, Mount Sinai School of Medicine.*

Acquisition parameters:
TR 2000 ms, TE = 5 ms, 3 mm slice thickness, 0.3 mm inter-slice distance.
FOV was 140x140 mm; spatial resolution of 0.54x0.54 mm. Turbo factor = 11.

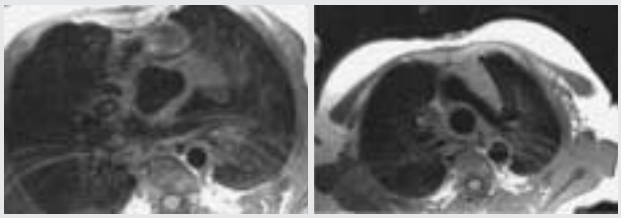

Figure 5 *Baby Heart. Image courtesy of Dr. N. Abolmaali. J.W. Goethe Universitätsklinikum, Frankfurt.*

Figure 6 *Carotid Artery Wall. Image of a 25 year old healthy male volunteer.*

Image courtesy of Dr. Stephen Worthley, Adelaide Wakefield Hospital, Australia. Acquisition parameters:
The images show an axial T1 weighted turbo spin echo image with a field-of-view of 11x11cm, and 256x256 matrix and slice thickness of 3mm. The image quality is evident and in the magnified view of the common carotid one can distinguish the normal media (high signal) from the surrounding dense adventitia (low signal).