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MSSW-MRA/S1

Product Data
No. MPDMR0245EA

MRA PACKAGE

APPLICATIONS

The MRA package is an optional package for the Toshiba magnetic resonance imaging (MRI) system.
This package provides new imaging functions as well as pulse sequences that are useful for contrast MRA*.

* Disclaimer: In the USA, the FDA limits the use of contrast agents to certain applications.

DEFINITION OF TERMS

- VisualPrep:
  Function for repeating the sequence of acquisition, reconstruction, and display in the same plane
- MovingBed:
  Function for moving the couch top automatically between scans and acquiring images of the patient at different scanning positions
- Monitor image:
  Image displayed during VisualPrep scanning
- STAMD (Sequential Target MIP Display):
  Function for changing the slice range for MIP processing in a step-by-step manner in order to depict the spatial relationship between blood vessels more clearly
- Time-SLIP (Time-Spatial Labeling Inversion Pulse):
  Inversion pulse that can be applied at an arbitrary timing and arbitrary position independent of the imaging plane
- Swirl encoding:
  Function for acquiring data in the outward direction, starting from the slice encode center and phase encode center of the k space. Since the data at the k space center is acquired first, the image contrast at the start of acquisition is utilized most effectively.

COMPOSITION

Software (License)..... 1 set

This package does not include an operation manual. Refer to the operation manual supplied with the MRI system.

APPLICABLE COMBINATIONS

This package is applicable to the following systems.
- Vantage Titan™ 3T

PERFORMANCE SPECIFICATIONS

This package provides the following functions.

- VisualPrep
  The time required for the contrast medium to reach the target region varies from patient to patient. The influence of these differences is reduced by VisualPrep, because it allows the operator to observe when the contrast medium reaches the target region and consequently enables scanning to be started at the optimum time.
  When subtraction is performed between the monitor image data and the reference image, inflow of the contrast medium can be displayed more clearly. Even when the contrast changes sharply immediately after the contrast medium enters the target region, images without signal inversion in the blood vessels can be displayed through subtraction using the complex data.
  – Scanning with the WB coil
    VisualPrep scanning with the WB coil is possible even when a receive coil is connected. The main scan can be performed with the optimal receive coil for the target region, while the WB coil enables the flow of contrast medium to be observed early, well before it reaches the target region. This feature makes it easier for the operator to start the main scan at the optimal timing.
    Applicable receive coils: All coils supporting the SPEEDER technique
  – VisualPrep scan at the start of the second segment of dynamic scan
    In dynamic scan, VisualPrep scan can be executed at the start of the second segment. It is possible to acquire images before contrast enhancement in the first segment and then perform imaging with VisualPrep in the second segment. The images can be subtracted automatically using the automatic post-processing function. It is also possible to acquire arterial-phase images in the first segment and venous-phase images in the second segment.
  – VisualPrep scan in each stage of MovingBed scan
    It is possible to specify whether or not VisualPrep scan is executed in each stage of MovingBed scanning. First, images before contrast enhancement are acquired in each stage. Then, after injection of contrast medium, the main scan can be started at the optimal timing in each stage using VisualPrep.
  – Gated scan
    Gated VisualPrep scan is possible. The heart can be imaged in synchronization with cardiac contraction.

- MovingBed
  The couch top is moved between scans to allow MRA to be performed over a wide range, such as from the chest or abdomen to the lower limbs. When used in combination with VisualPrep, scanning can be started at the optimum time. It is possible to specify individual overlaps between stages. Optimal couch top slide distances can therefore be set for each region according to the flow speed of the contrast medium.
  In systems, the scanning conditions and imaging plane can be specified for each couchtop position in scans with FFE3D sequences. Thus shimming acquisition can be performed semi-automatically in advance at each couchtop position, enabling effective fat suppression.
- STAMD
  The spatial relationship between blood vessels is depicted more clearly by changing the slice range for MIP processing in a step-by-step manner.
- Dynamic complex data subtraction
  After dynamic acquisition in main scanning, subtraction using complex data is possible between the dynamic images and the reference image that is acquired before contrast medium injection. Subtraction using complex data prevents signal inversion in the blood vessels. It is possible to execute subtraction automatically after data acquisition is completed.
- Support of fat suppression in FFE3D Swirl encode imaging
  This package enables fat suppression in FFE3D Swirl encode imaging. The increase in the scan time is minimized by applying the fat saturation pulse most effectively.
- Time-SLIP
  When combined with FBI (FASE) or trueSSFP, this prepulse enables artery/vein separation and hemodynamics observation without the use of contrast medium. By acquiring data while turning the t-SLIP pulse ON/OFF, subtraction images with less misregistration can be obtained and the target blood vessel can be extracted more clearly. This prepulse is applicable mainly to vascular imaging of the abdomen and the lungs without contrast medium.

VisualPrep software

This software has the following features.

– Time required to switch from monitoring scan to main scan: Minimum 3 s
– Setting of delay time from scan start: Available
– Use of AutoVoice: Available
– Monitoring scan in a plane different from the plane to be acquired in the main scan: Available
– Maximum matrix size: 128

MovingBed software

It has the following features.

– Couch-top slide speed:
  · 30 cm/5.0 s or less (including pause time after sliding)
  · 35 cm/5.5 s or less (including pause time after sliding)
  · 40 cm/6.0 s or less (including pause time after sliding)
– Minimum time between end of scanning and start of couch-top sliding:
  · 0.5 s

RESTRICTIONS

Complex data subtraction between images acquired in the main scan is possible only for dynamic images acquired using the same protocol.
It is not possible to perform complex data subtraction between images acquired using different protocols.

POWER AND ENVIRONMENTAL REQUIREMENTS

The power and environmental conditions are the same as for the MRI system.

COMPLIANCE WITH STANDARDS

This package complies with the same standards as the MRI system.

MASS

Unit	Mass (kg)
MRA package	Approx. 0.5

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2010-1 TME/KI

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Printed in Japan