

How to get Inline Reconstructed Rotating MIPs with a 3D SPACE Measurement

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In the Siemens software versions *syngo* MR E11 and D13, a measurement within the Abdomen Dot Engine offers a unique option to obtain inline reconstructed rotating maximum intensity projections (MIPs). Those are primarily intended to be generated for the high-resolution MR cholangiopancreatography (MRCP) visualization by a respiratory triggered 3D SPACE measurement.

Nevertheless it is possible to use this functionality outside the Abdomen Dot Engine and adapt it to other 3D SPACE protocols. In this article we

will describe how to use this tool for lumbar spine myelography; however, you can do this for every 3D SPACE.

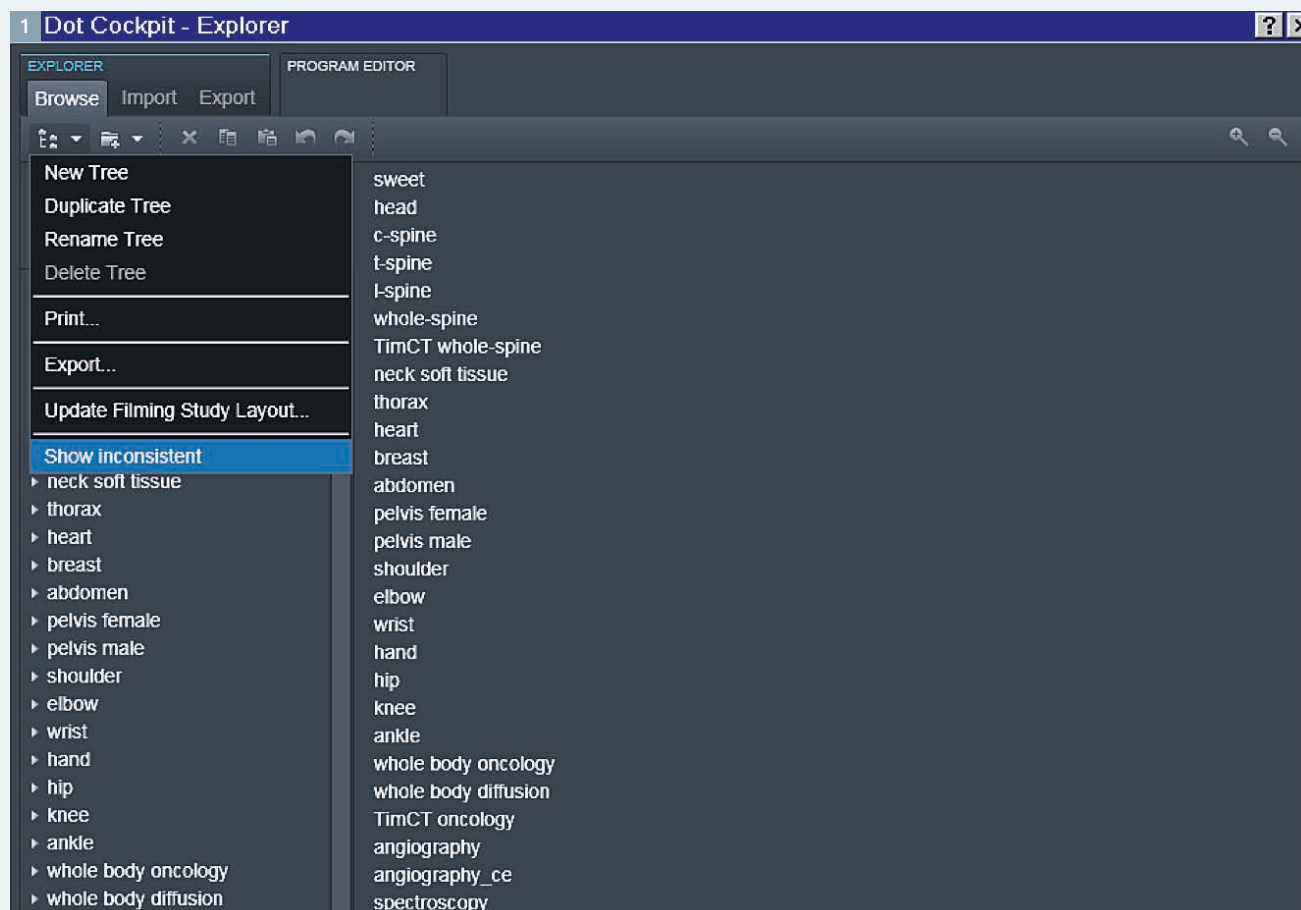
The functionality of the inline MIP reconstruction is linked to the GenericViews Dot AddIn for the said MRCP measurement. You will find it in the Abdomen Dot Engine under the name "t2_space_cor_trig".

Even if your MR system does not have the license for the Abdomen Dot Engine, you can still use it, it works independently from a Dot environment: only the AddIn is essential and must be kept.

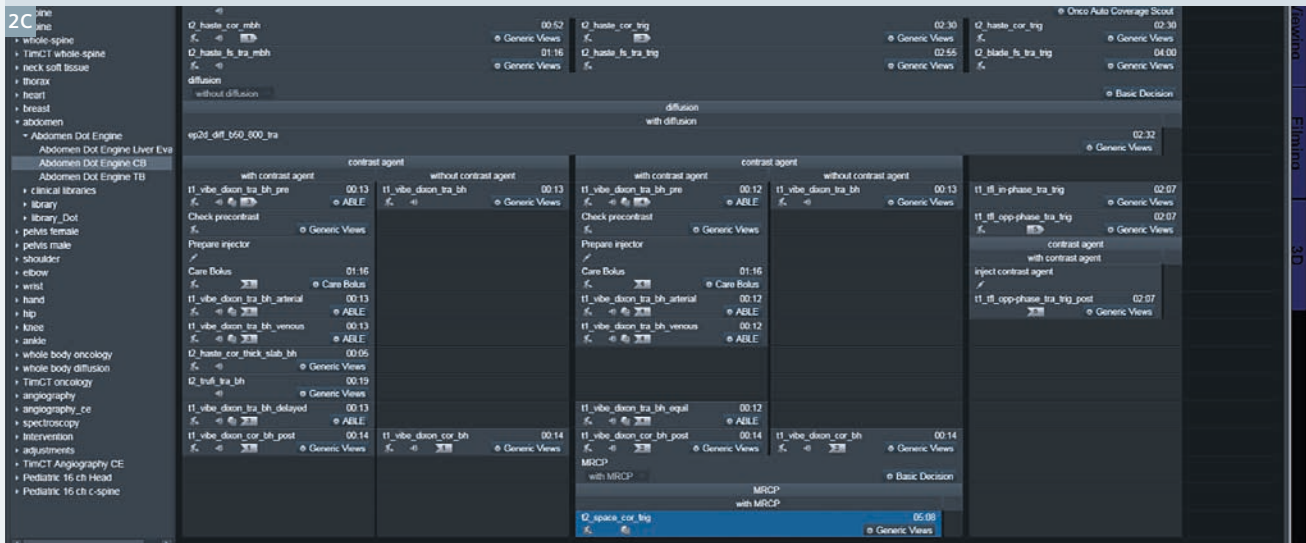
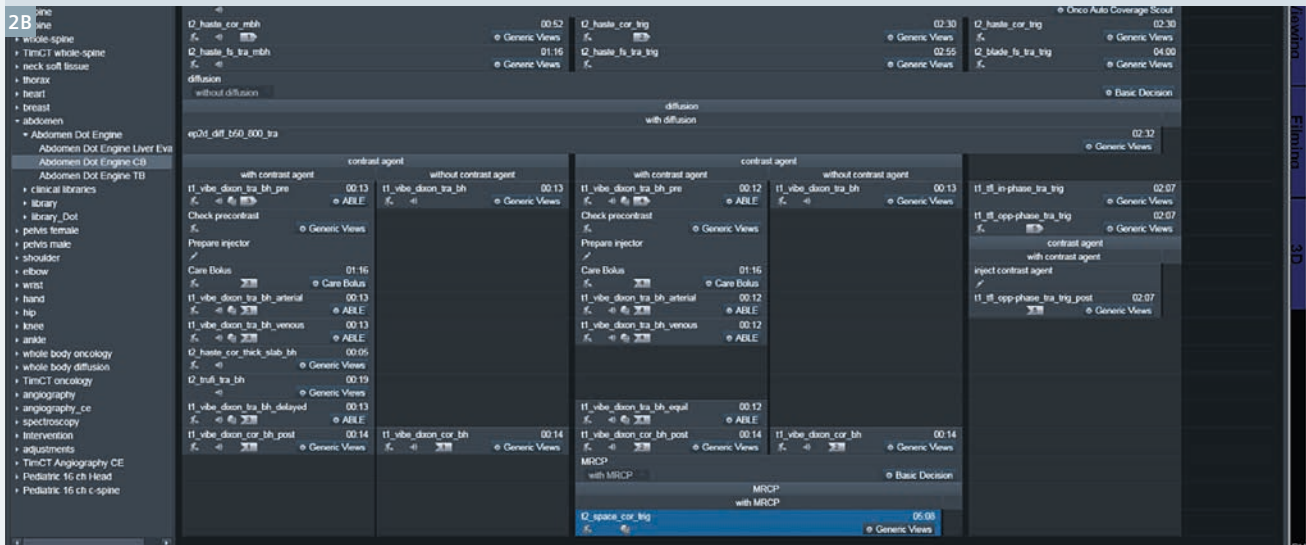
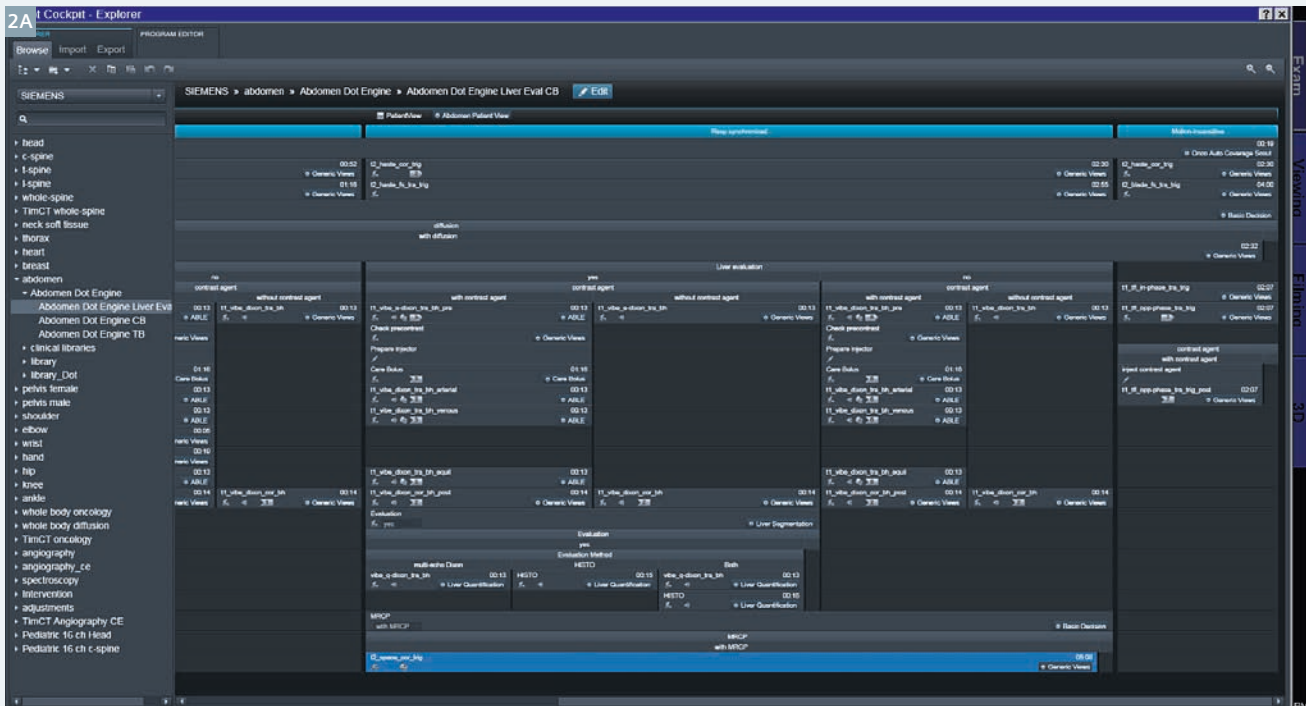
If you do not have a license for the Abdomen Dot Engine, you need to get access to unlicensed programs and protocols first. Open the Dot Cockpit, click on "Organize tree" and enable "Show inconsistent" (Fig. 1).

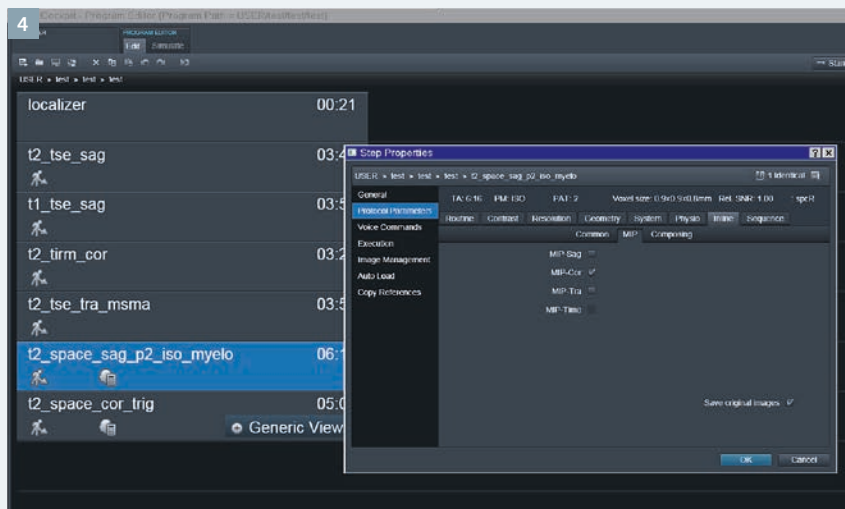
Select the Siemens tree, go to folder "abdomen" > "Abdomen Dot Engine".

For all the Siemens Abdomen Dot Engines, the protocol can be found in the Dot strategy "Resp synchronized". It is in each case the bottommost protocol (Figs. 2A, B, C).



1 Open the Dot Cockpit, click on "Organize tree" and enable "Show inconsistent".

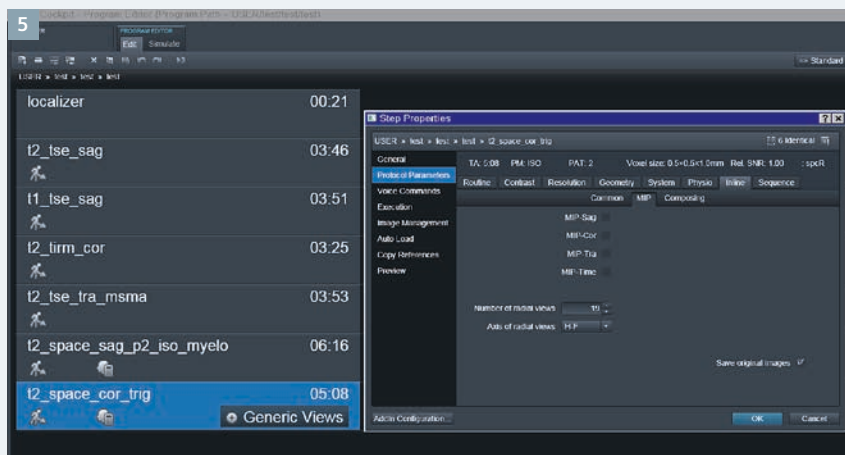




Copy the protocol “t2_space_cor_trig” to its designated place in the user tree (Fig. 3).

To use the inline MIP reconstruction with another 3D SPACE protocol, first set this protocol up, as it should be acquired. In this example, the default “t2_space_sag_p2_iso_myelo” was taken as pattern.

The standard protocol for lumbar myelography “t2_space_sag_p2_iso_myelo” shows inline functionality “MIP-cor” (Fig. 4).

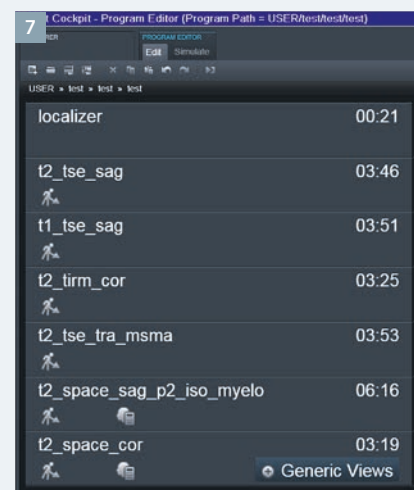
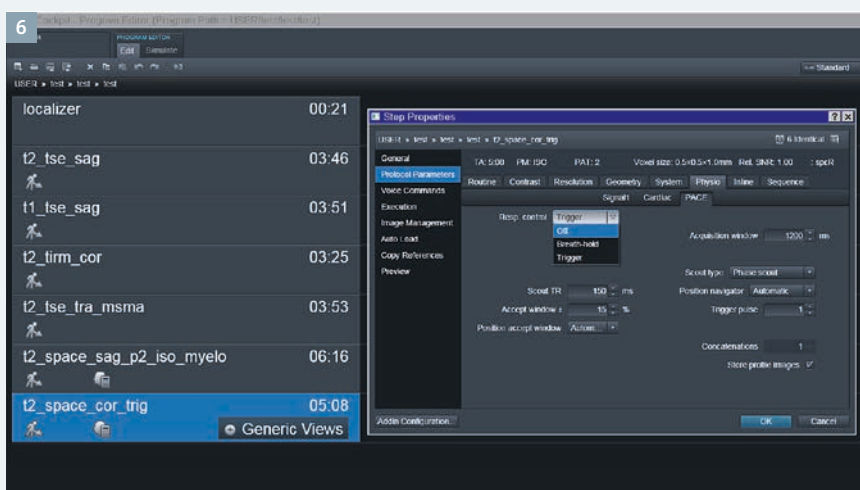


The MRCP-protocol “t2_space_cor_trig” shows inline functionality with radial views and the option to select a reconstruction axis of the radial views (Fig. 5).

Nevertheless, you should not delete the Generic Views AddIn since this is essential, although it might not be directly obvious.

The inline reconstruction is available in the protocol parameters. Never-

As a next step, you should ensure that the intended MRCP protocol has a respiratory trigger. For myelography a trigger is not intended, so the trigger should be set to “Off” (Fig. 6);



this will result in scan time reduction (Fig. 7).

Now you have to assimilate the protocol parameters.

Do NOT use the copy reference “Everything”, because this will destroy the linked AddIn! Simply copying the AddIn is insufficient, too, since the inline functionality is implemented in the protocol parameters. You should therefore work step-by-step, starting with the copy reference “Measurement parameters” with the myelography protocol as origin and the former MRCP protocol as target.

“Copy phase encoding direction” should also be checked (Fig. 8).

If a pop-up window appears showing copy reference conflicts, just accept them.

The copy reference “Measurement parameters” performs changes according the geometry and resolution including field-of-view (FOV) read, FOV phase, slice thickness, orientation, position, phase- and slice oversampling, the number of slices per slab, base and phase resolution.

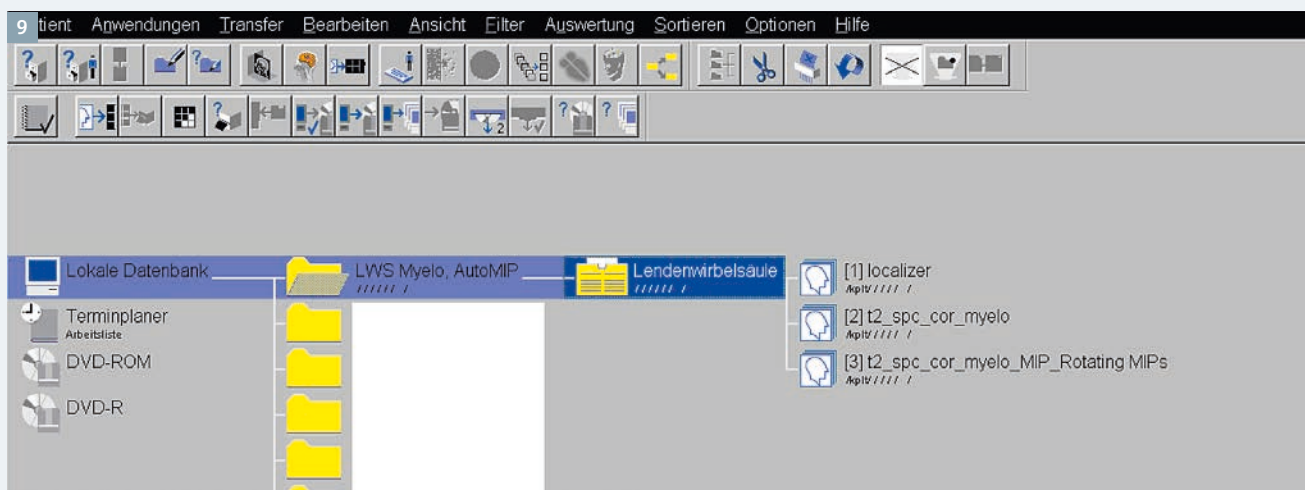
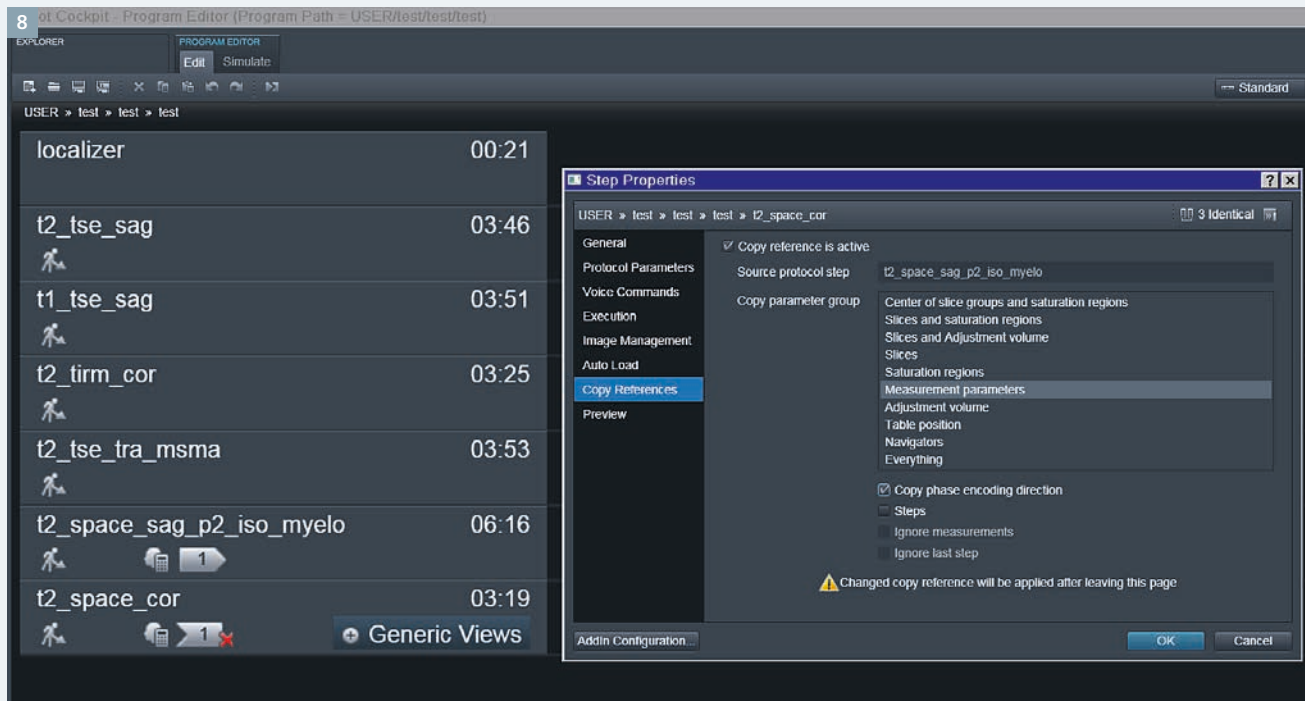
However, parameters affecting the contrast, such as TR, TE, number of

averages, flip-angle, partial Fourier, fat-sat pulse, turbo-factor and bandwidth are not adapted, and these have to be changed manually.

Eventually the protocol might be renamed.

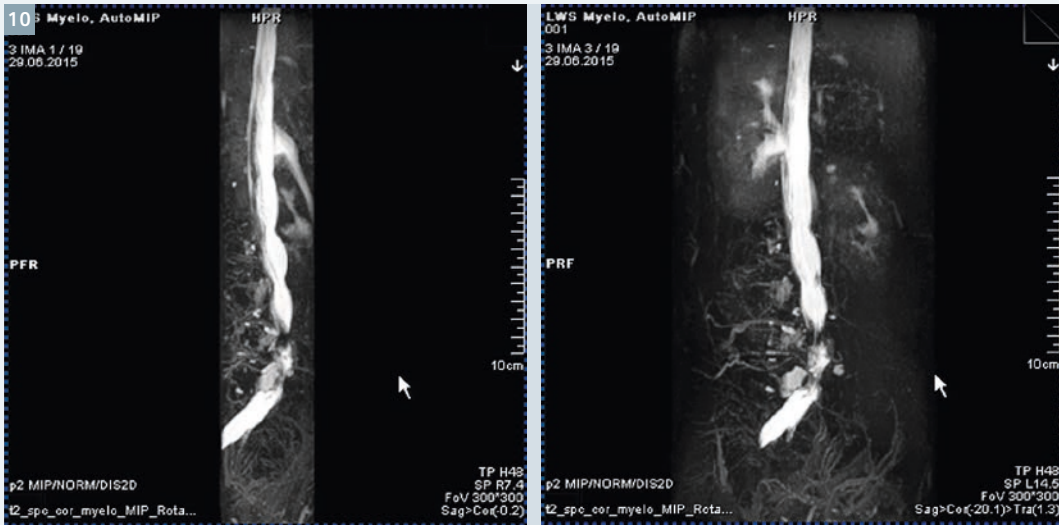
If you want to acquire coronal instead of sagittal, that’s no problem, because the SPACE works fine in coronal orientation, too.

Having acquired the measurement, the inline calculated MIPs can be identified in the patient list by the measurement’s name suffix “_Rotating MIPs” (Fig. 9).

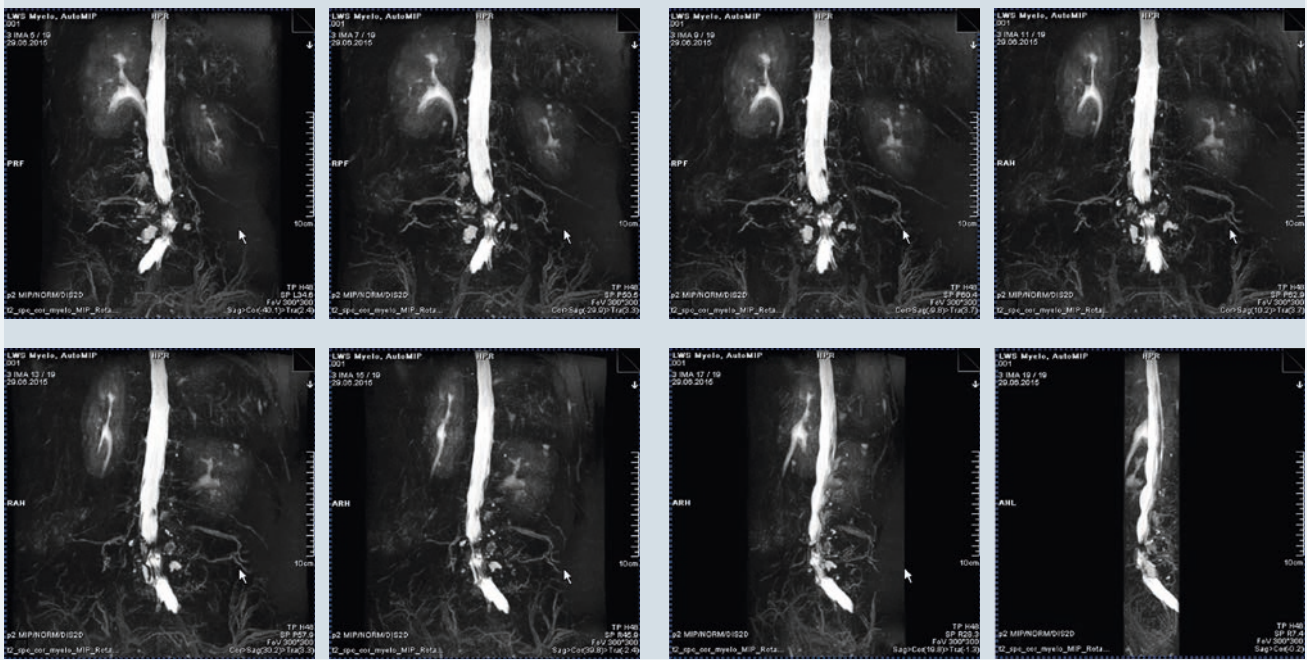


The following image collection shows inline reconstructed rotating MIPs (every second image). These images are courtesy of the Radiological Insti-

tute Hohenzollernstraße in Koblenz, Germany, where the inline reconstructed MIPs are used for lumbar myelography in clinical routine.



10 MR myelography shows a bisegmental lumbar spinal canal stenosis.



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