

# Managing Head Exams in Claustrophobic Patients Undergoing MRI: Challenges and Strategies Using MAGNETOM Free.Max

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Magnetic resonance imaging (MRI) is one of the most efficient diagnostic methods, providing detailed images of the body's internal structures. However, the procedure can be distressing for claustrophobic patients due to the confined space of the MRI scanner. This article addresses claustrophobia in MRI patients and presents strategies for improving the patient experience.

The impact of claustrophobia is profound, often requiring the use of sedation, which can increase health-care costs and delay diagnosis.

With its ultra-wide 80 cm bore, the 0.55T MAGNETOM Free.Max scanner is designed to enhance the patient experience. The wider bore provides a less confining environment, making the experience more comfortable. The system has a compact design with a shorter magnet length and is designed to allow for more flexible patient positioning. Measures such as using Contour coils, music during the scan, and cushions for positioning can further increase comfort.

The MAGNETOM Free.Max Head/Neck coil has a 12-channel design with 12 integrated pre-amplifiers with three rungs of 4 elements. The coil is tilted to 9 degrees to give patients the feeling of lying on a pillow. The upper part, with 6 elements, can be easily removed. The lower

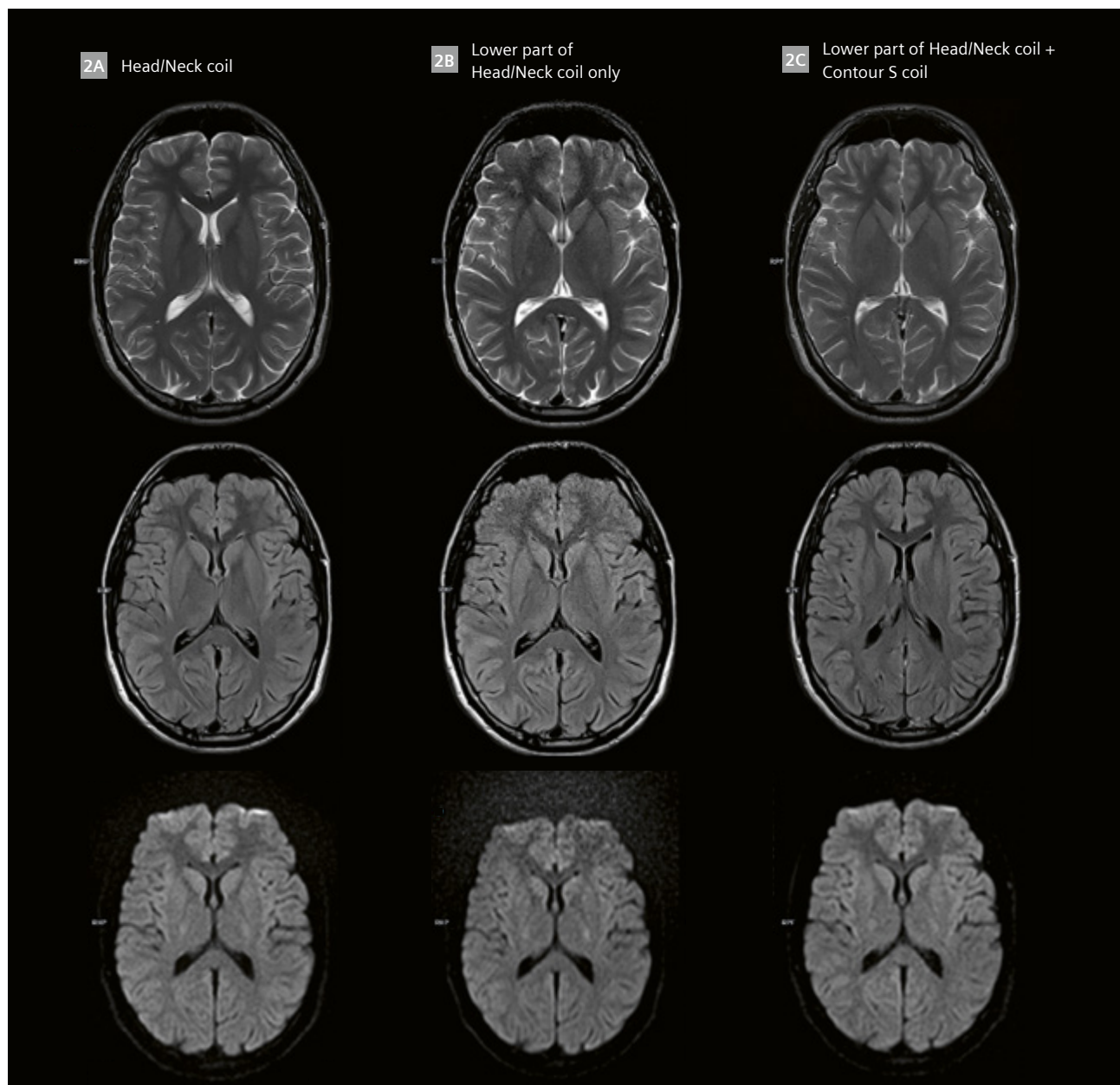
part, also with 6 elements, is usable without the upper part for highly claustrophobic patients.

When using only the lower part of the coil, the AutoAlign option still works even with the open coil. Deep learning-based image reconstruction using Deep Resolve Boost helps denoise the image and achieve good quality. We also need to make some changes on the protocol side, such as selecting prescan normalize, increasing the FOV, and changing the iPAT factor and average. The aim is to increase SNR when you scan without the upper part of the Head/Neck coil.

Another approach is to use the flexible Contour coils. The system can be configured with all three Contour coils: large (L), medium (M), and small (S). The Contour S coil with 6 channels is typically used for knee, shoulder, elbow, and other MSK exams. The high flexibility of the coil means we can set it up as a "hat" and produce a great image while the patient benefits from more comfort. This approach does not require any further changes to the protocol. AutoAlign works as usual and you can keep using the same parameters and achieve the same image quality as the standard brain examination with the Head/Neck coil. This method can also be used on 1.5T and 3T systems using the Flex or UltraFlex coil.

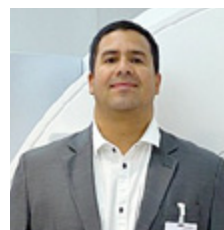


**1** Positioning a claustrophobic patient for a head exam on a 0.55T MAGNETOM Free.Max. (1A) Both parts of the Head/Neck coil; (1B) lower part of the Head/Neck coil only; (1C) adding the Contour S coil.



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- 2** The sequences in (2A) and (2C) are the same: field of view  $230 \times 201$ , BW 100, average 2, TE 114, Grappa 4. The sequence in (2B) was acquired without the upper part of the coil and differs slightly: field of view  $240 \times 240$ , Grappa 3, and turbo factor 17. Of note, in (2B) the frontal region shows reduced image quality compared to temporal and okzipital regions. This is certainly a limitation of this coil setup.



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