MRI Anatomy

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Magnetic resonance imaging (MRI) is diagnostic imaging technique providing high-resolution, detailed images of human body in an non-invasive manner and moreover, not exposing the patient to harmful ionizing radiation.

During an MRI examination patient is placed in a strong magnetic field which forces protons (hydrogen nuclei) within the scanned area to spin in a synchronous way with the formation of longitudinal net magnetization vector. Application of external radiofrequency wave causes change in directions of spins and occurrence of transverse magnetization vector. Once radiofrequency impulse ceases, protons return to the basic position and this process is called relaxation. As the relaxation times (measured in milliseconds) differ in various tissues hence registered images are also slightly different which enables visualization of tissues and organs.

MRI does not use ionizing radiation therefore is potentially non-harmful to human beings. Nevertheless, there are many contraindications for MRI scans that exist, which have to be taken into account when referring a patient for the study. Moreover, the examination is not free from artifacts and technical problems.

A detailed description of the methodology as well as contraindications is presented in the previous chapter.

Within the maxillofacial area MRI primarily serves as a means of imaging of soft tissues, especially tumors, cysts, and inflammatory processes. It is also currently the best method of imaging of soft tissues of temporomandibular joint thus is crucial to dentists, especially those dealing with prosthodontics and temporomandibular joint disorders.

The following is a series of magnetic resonance images of maxillofacial area with emphasis on the soft tissue imaging (Figs. 12.1, 12.2, and 12.3).

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A. Delantoni, K. Orhan (eds.), *Atlas of Dentomaxillofacial Anatomical Imaging*,
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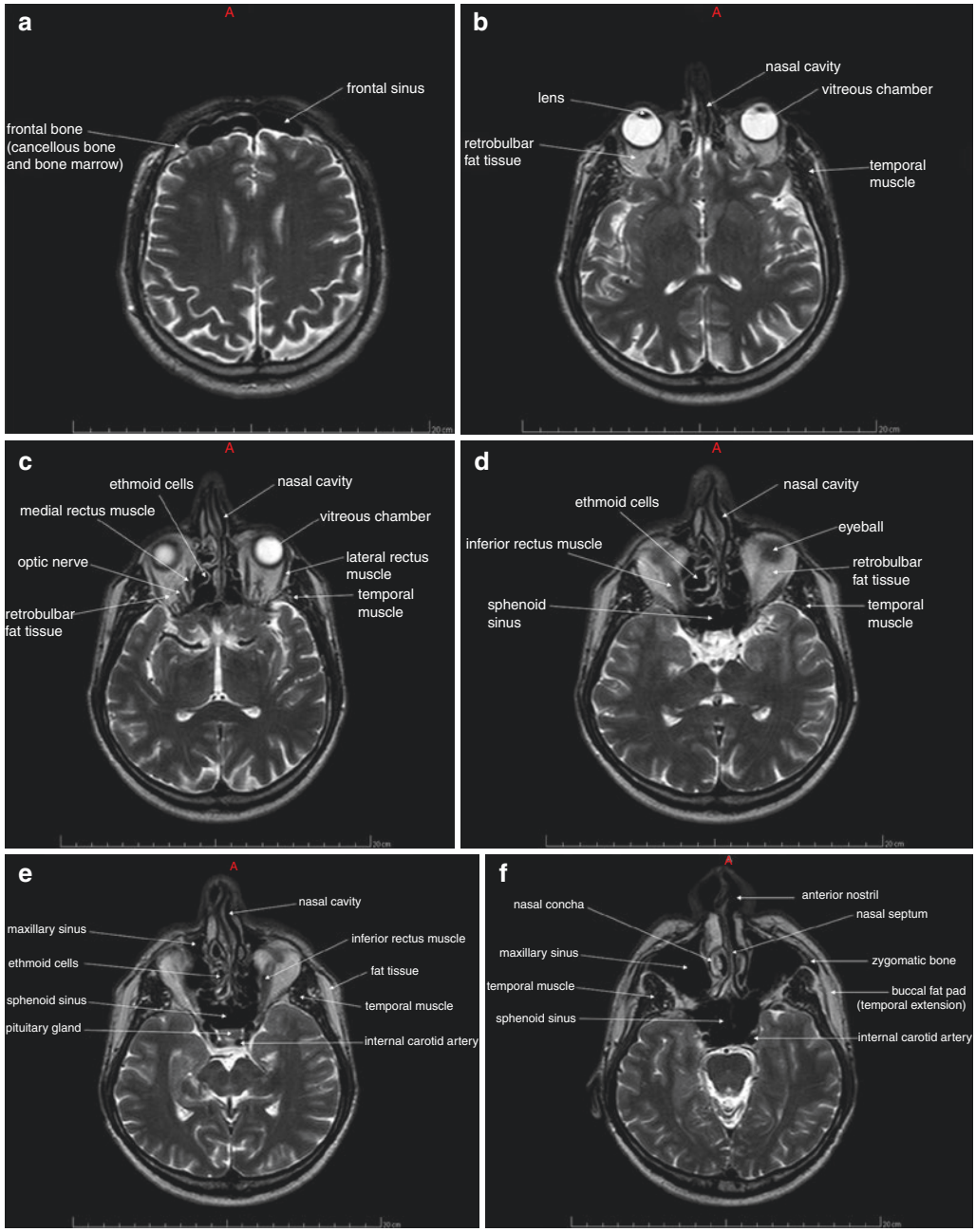

Fig. 12.1 MR anatomy in axial slices

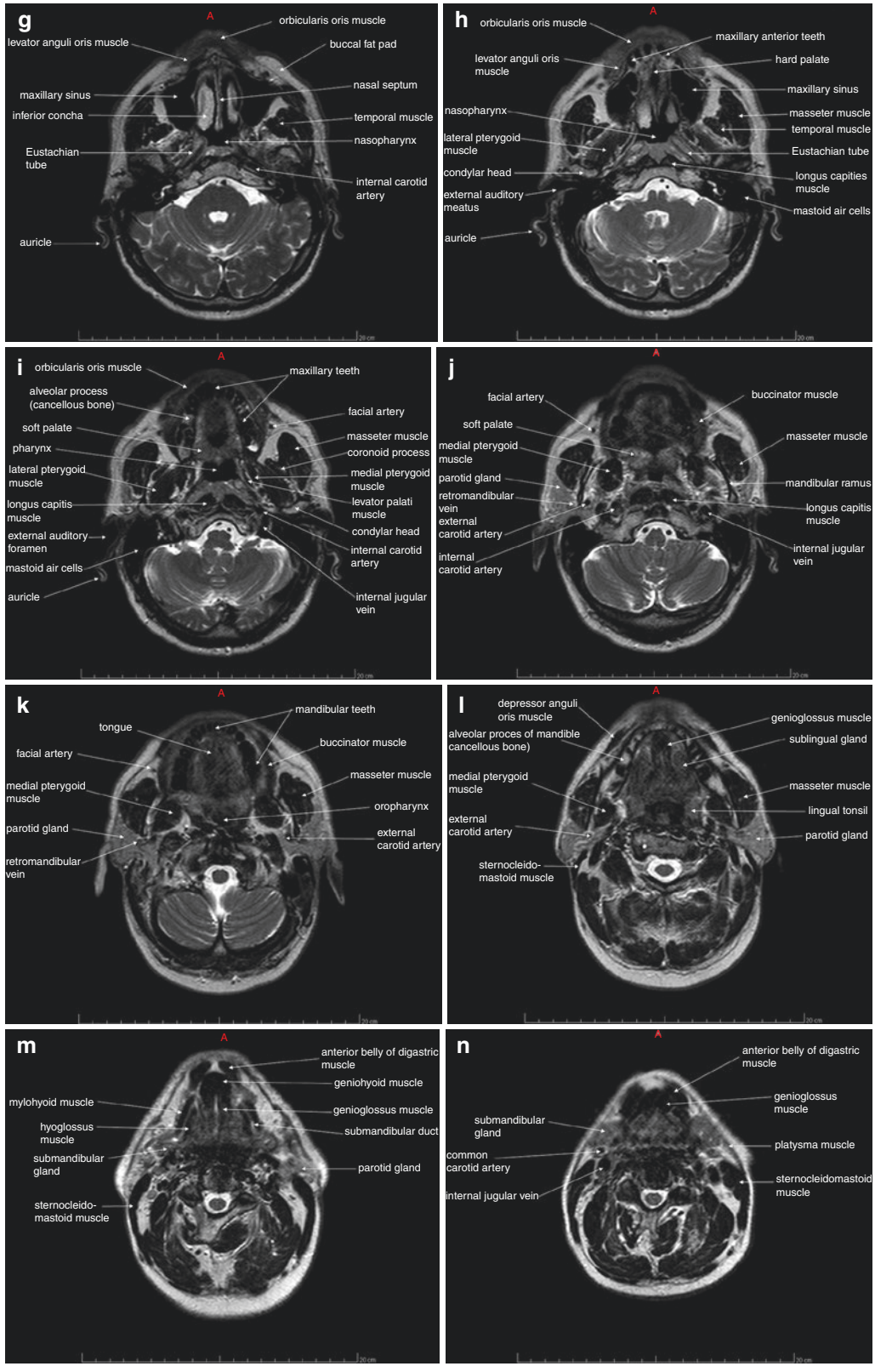

Fig. 12.1 (continued)

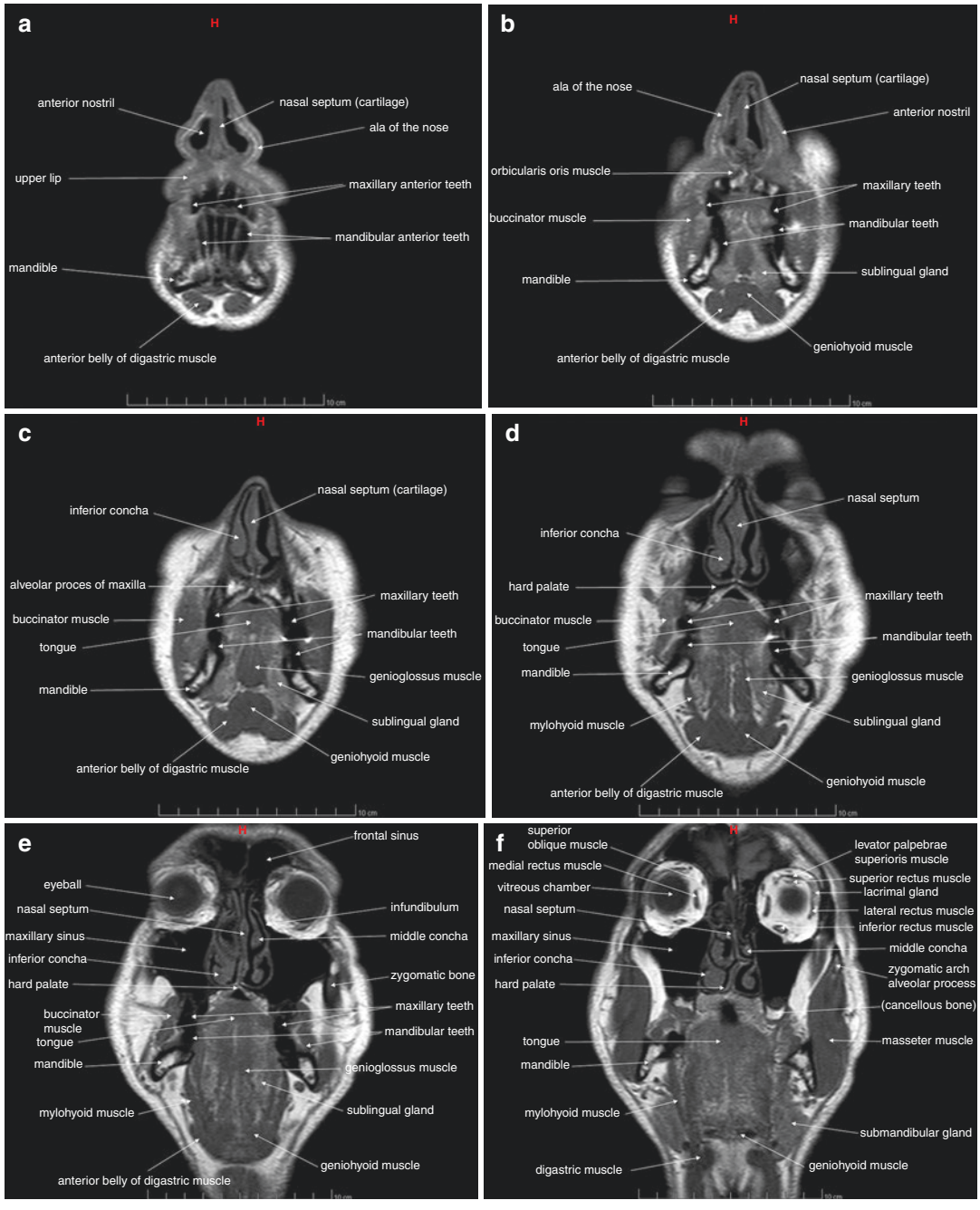

Fig. 12.2 MR anatomy in coronal slices

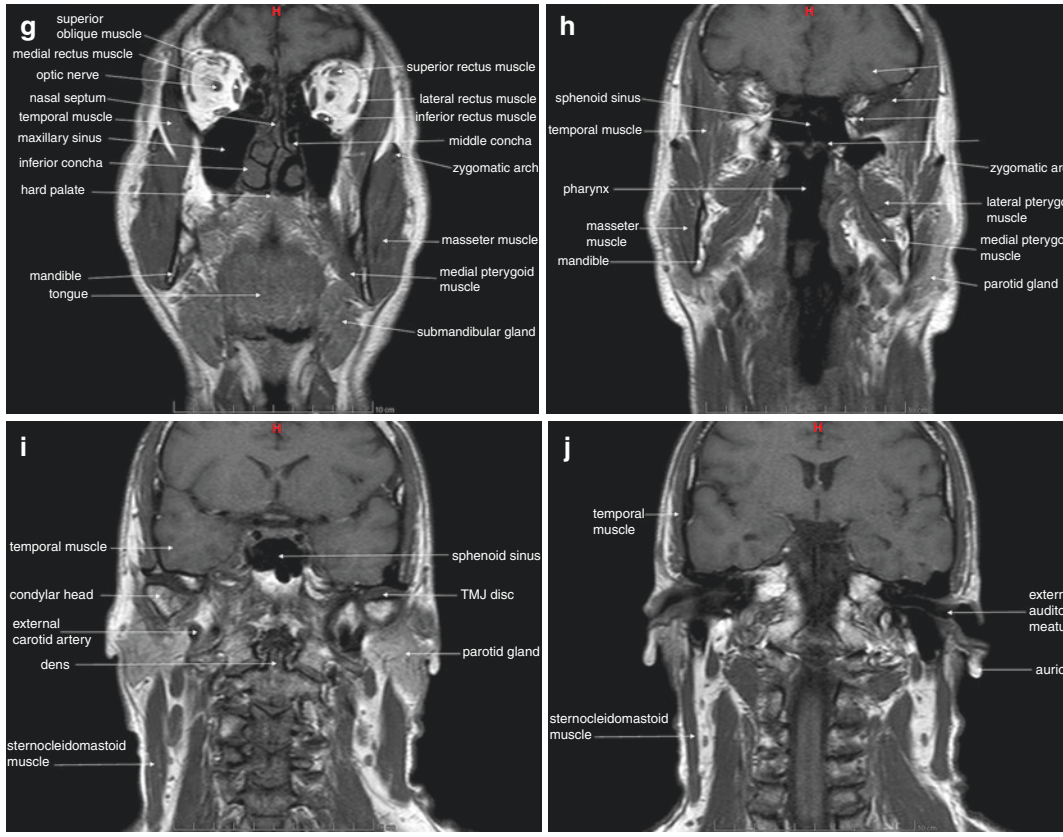

Fig. 12.2 (continued)

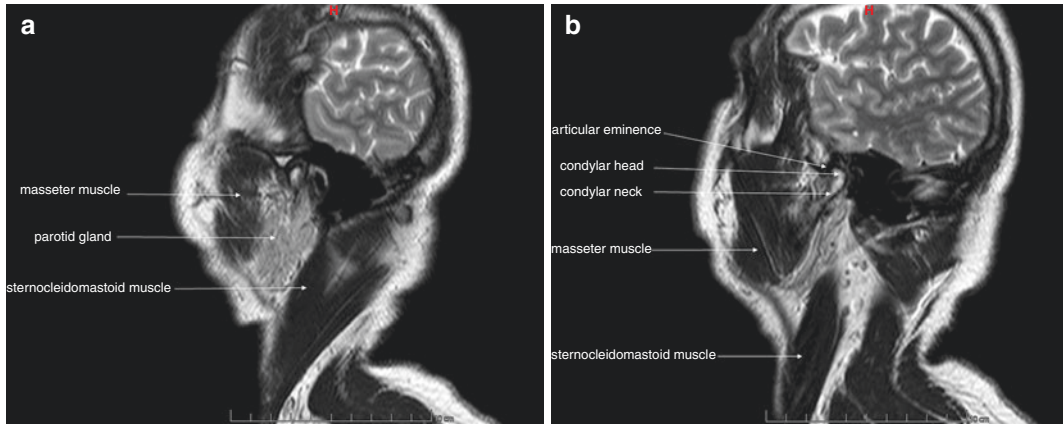

Fig. 12.3 MR anatomy in sagittal slices

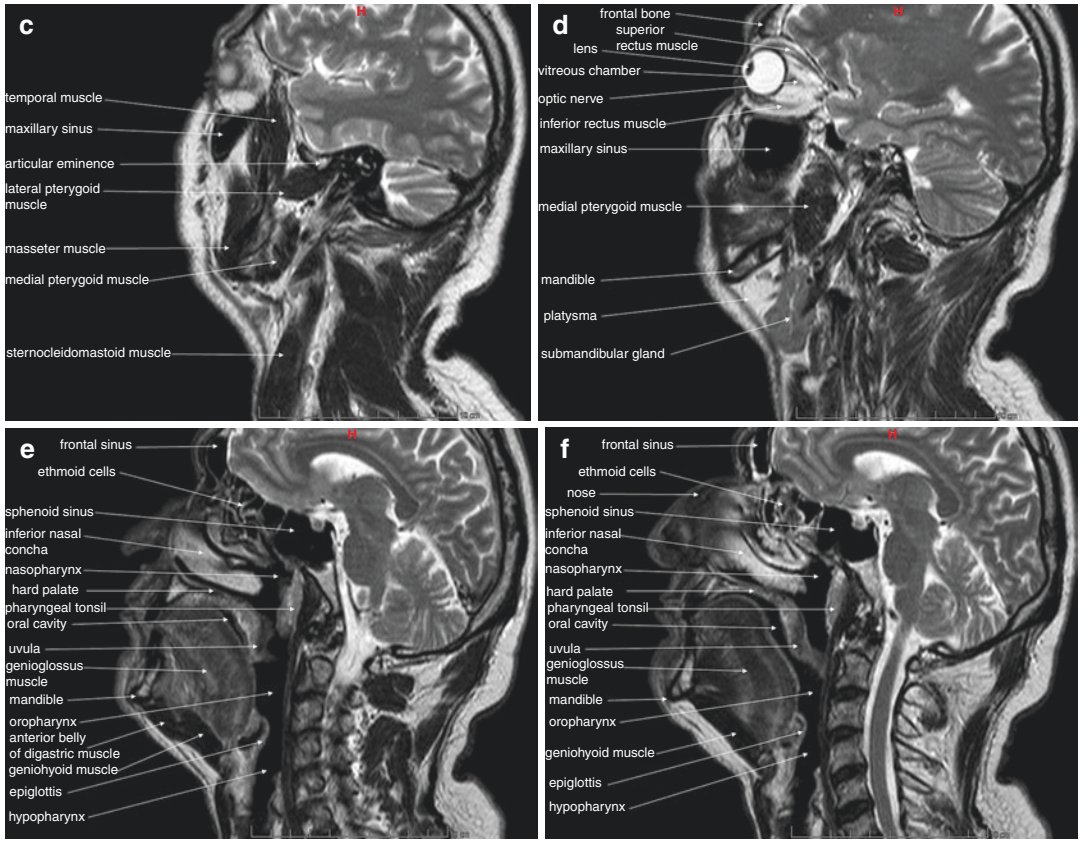

Fig. 12.3 (continued)

Further Reading

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