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## Discussion

### Virtual Arthroscopy of the Visible Human Female Temporomandibular Joint

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This study illustrates how volume-rendering and real-time image processing by means of "fly-through simulation" can produce nice virtual views of a temporomandibular joint (TMJ), similar to real TMJ arthroscopy.

The authors used a Silicon Graphics workstation (Mountain View, CA) and Analyze software (Biomedical Imaging Resource, Mayo Foundation, Rochester, MN), both clinically proven devices for 3D imaging of anatomical structures. For image data acquisition the authors used high resolution ( $2,048 \times 1,216$  pixels !) images of cryosections (at 0.33 mm interval) of an adult female cadaver, made accessible by the National Library of Medicine.

We are of the same opinion as the authors, when they summarize, that for the quality and clarity of volume rendered, virtual anatomic structures, the resolution of the acquired images and slice thickness is of paramount importance. Because there are no cryosections available for the diagnosis of temporomandibular disorders in a living patient, one has to rely on computed tomography or better magnetic resonance imaging. Unfortunately, nowadays magnetic resonance imaging has approximately  $256 \times 256$  pixels and slice a thickness of 2 to 4 mm which, as the authors tell us, results in poor imaging. Our conclusion is that the actual problem would not be to depict a suitable surface-rendering software out of a huge commercial market, but to increase the resolution of magnetic resonance imaging by an approximated factor of 10 or even more.

The presented technology has apparent advantages and might one day hold a key role in the diagnosis of temporomandibular disorders, although doubt if this will be possible in the near future, as the authors conclude.