

The Beauty of Life

Hui-Cheng Cheng, M.D., Ph.D.

VGH Healthtech International, Taiwan

Goal

Besides medical application and scientific research, MRI can also be used to engrave lives and to inspire imagination. We have tried to explore and present the beauty of life through MR imaging.

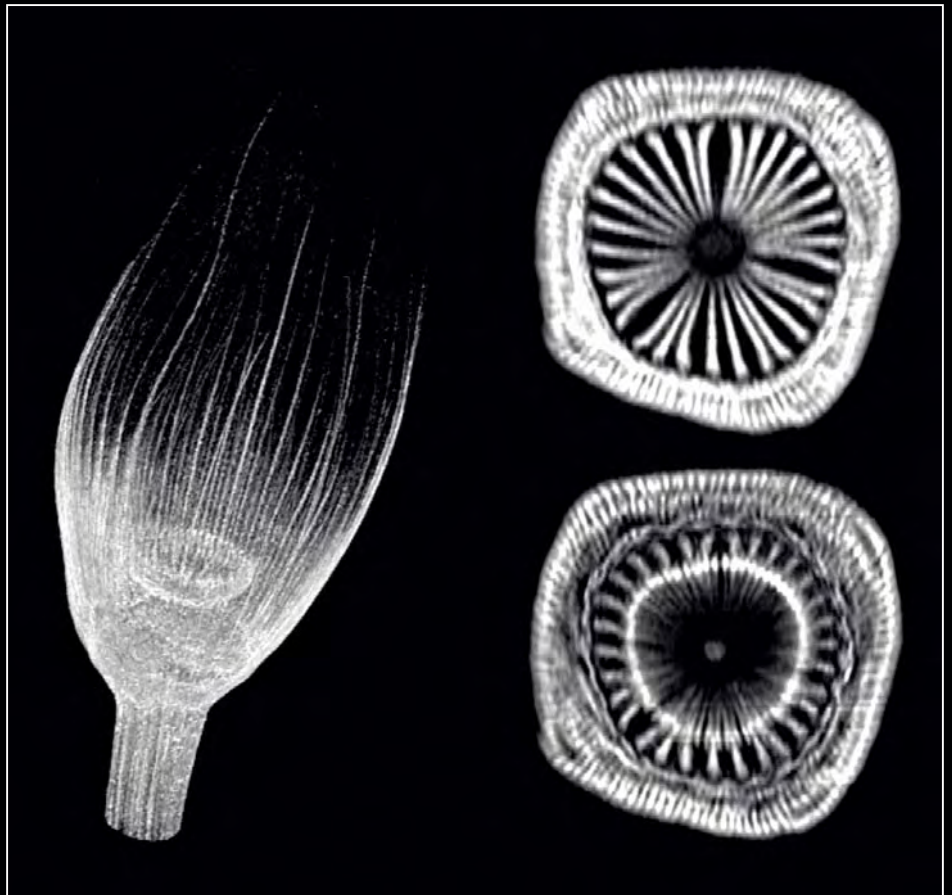
Materials and Methods

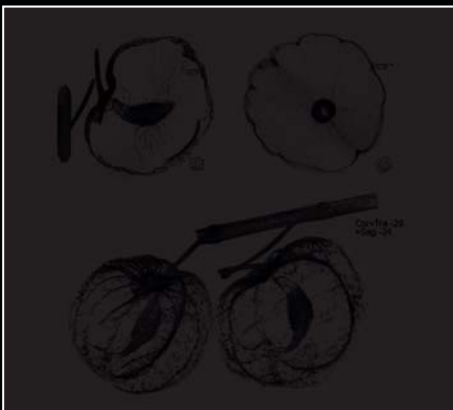
MR imaging by clinical scanner (MAGNETOM Symphony, A Tim System, Siemens, Erlangen, Germany) utilizing the knee coil was performed for the following objects:

Fruit: Acquired in T2-weighted imaging technique, 3D fast imaging by steady state free-precession (TrueFISP) (TR/TE = 8.14/4.07 ms; flip angle = 50°; FoV = 160 mm; matrix = 320 x 320; slice thickness = 0.2–0.4 mm; average = 1).

Flowers: Acquired in T1-weighted imaging technique, 3D volumetric interpolated breathhold magnetic resonance imaging (VIBE) (TR/TE = 9.35/4.76 ms; flip angle = 120; FoV = 160 mm; matrix = 512 x 512; slice thickness = 0.2–0.4 mm; average = 2). Flowers and plants were soaked in diluted (1:100) 0.5M Gadodiamide (Omniscan, Amersham Health, Cork, Ireland) for 1–2 days before scanning.

Seashells: Acquired in T1-weighted imaging technique, the sequences and the parameters used were as in Flowers. The objects were soaked in diluted (1:100) 0.5M Gadodiamide before scanning. All the images had been postprocessed by using Maximum Intensity Projection (MIP), MultiPlanar Reconstruction (MPR) or 3D Volume Rendering Technique (VRT).





Discussion

Fruits generally have more water content, better to be acquired by T2-weighted imaging. 3D TrueFISP provides fast T2-weighted images with high resolution and good signal-to-noise ratio (SNR). But to be able to show the veins in the petals, stamen and stigma of a flower, soaking in diluted gadolinium before scanning is needed so that the flowers could enhance when using 3D VIBE. However, some flowers do not uptake gadolinium readily, such as sunflower and rose. Seashell has

unique spiral skeleton that is exceptional and intriguing. The seashell does not have any water element to be visualized in MR imaging. Placing the objects in diluted gadolinium solution provides negative contrast during scanning with both 3D TrueFISP and 3D VIBE. The results of TrueFISP were superior in SNR but had less field homogeneity. We also tried fly-through technique to navigate the inside of a seashell.

Conclusion

The 3D data set allows to demonstrate the superficial and internal details of the objects thereby enabling us to photograph nature in a very unique way. MRI can provide an additional perspective to reveal the beauty of life, which we have not yet experienced.



