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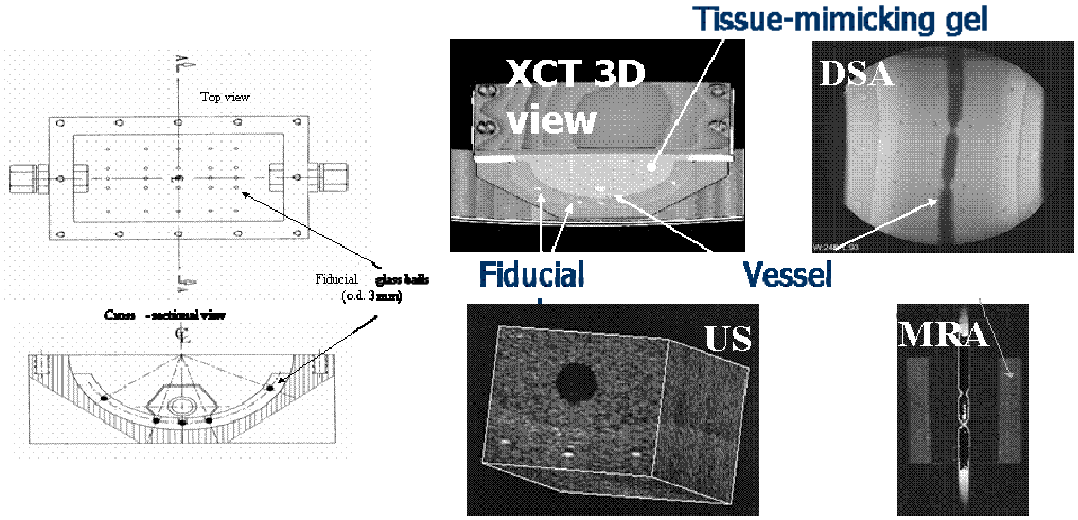
Technology Fact Sheet

MULTIMODALITY IMAGING PHANTOM AND PROCESS FOR MANUFACTURING SAID PHANTOM



Reference	PTP2001
Inventors	Pierre TEPPAZ, Salah Dine QANADLI, Guy CLOUTIER, Gilles SOULEZ, Richard CIMON, Louis-Gilles DURAND
Publications	US patent application 10/495,407 (Published: June 9, 2005) PCT patent application WO 03/040745 A1 CA patent application CA02/002466100 See the attached publication list

Investigators at the Institut de recherches cliniques de Montréal (IRCM), at the Centre hospitalier de l'Université de Montréal (CHUM) and at the Université de Montréal (UdeM) have discovered and developed a multimodality imaging phantom that is particularly useful for calibrating imaging devices or apparatuses using different imaging modalities.

Highlights

1. With markers implanted at precise known locations, this innovative phantom can be used for calibration, rescaling and fusion of 3D images obtained from four different modalities (ultrasound, magnetic resonance imaging, computer tomography, and angiography), and it can be used for 3D image reconstruction from angiographic plane views.
2. The phantom technology can be used as a platform to test or teach endovascular intervention procedures or the use of imaging instruments.

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3. The phantom technology can be used to facilitate the study of complex vascular vessels (stenoses or aneurysms of different shapes, sizes and orientations), or vascular devices (such as stents and endovascular prostheses).
4. The phantom technology equipped with an inlet and outlet can be included in a mock flow model to simulate physiological flow with a pump. Both blood and mimicking fluid can be circulated in the phantom. Diffusion through the vessel wall is avoided in the phantom thus allowing the use of contrast agent for each imaging modality.
5. Recent improvements have allowed the development of more robust phantoms as well as an increasing efficiency of the phantom manufacturing process.
6. The long-term durability of the phantom has been improved and the integrity is expected to be maintained for several years.
7. New series of phantoms with geometries mimicking vascular pathologies of the aorta and lower-limb vessels were developed and are available for multimodality imaging.

Further Publications

Cloutier G., Soulez G., Qanadli S.D., Teppaz P., Allard L., Qin Z., Cloutier F., Durand L.G., **A multimodality vascular imaging phantom with fiducial markers visible in DSA, CTA, MRA, and ultrasound.** Med Phys. 31(6):1424-33, June 2004.

Boussion N., Soulez G., de Guise J., Daronat M., Qin Z., Cloutier G., **Geometrical accuracy and fusion of multimodal vascular images : A phantom study**, Med Phys. 31(6):1434-43, June 2004.

Létourneau-Guillon L., Soulez, G., Beaudoin G., Oliva V.L., Giroux M.F., Qin Z., Boussion N., Thérasse E., de Guise J., Cloutier G., **CT and MR imaging of nitinol stents with distal markers**, J. Vasc. Interv. Radiol., 15(6):615-24, June 2004.

Tang A., Cloutier G., Therasse É, Beaudoin G., Qanadli S., Giroux M.F., Boussion N., de Guise J., Oliva V., Soulez G., **Optimization of peripheral MRA acquisition parameters: A vascular phantom study**, submitted for publication, 2005.

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