LETTERS TO THE EDITOR

Macromolecule lymph-compatible MR contrast agent for the diagnosis of lymphatic circulation disorders

Imaging can be important for diagnosis of lymphatic disorders. However, visualizing the lymphatic system remains difficult. Conventional radionuclide-based lymphoscintigraphy (LSG) imaging has poor resolution. Magnetic resonance image (MRI) in combination with LSG can provide a more complete evaluation of the lymphatic system,[1] but the slow lymphatic flow can be visualized with conventional noncontrast MRI only when lymph flow is impaired or the lymphatic vessels are dilated and filled with stagnated lymph.[2] Although in MR imaging lymph flow itself may act as a contrast medium to highlight the path of the lymphatic channels when the background is saturated, we believe a positive contrast agent is optimal to assess lymphatic function.

The lymphatic system absorbs and transports macromolecule fatty acids and fats as chyle from tissue space to the circulatory system. The aim of injection of contrast agent into the intradermis is to facilitate initial diffusion into the initial lymph vessels or precollectors. Subsequently, the contrast agent travels through lymph collector, deep lymph vessels, regional lymph nodes, and finally into the circulation.

At present, magnetic resonance lymphangiography (MRL) using commercially available Gd-containing contrast agent can reflect the anatomy and functional status of lymphatic vessels and lymph nodes.[3] However, the quality of images and the assessment of lymph transport function are affected by the low molecular weight contrast agent delivered directly into the lymphatic system and the absorption of the agent from the tissues surrounding the site of injection.[4]

The enhancement rate of lymph nodes is closely associated with the molecular size of the contrast agent used in MRL after subcutaneous administration. Small molecular contrast agents are only temporarily retained in lymph nodes. This results in only short-term enhancement of lymph nodes. Therefore, a macromolecule, lymph-compatible MR contrast agent could be useful in imaging of the lymphatic system. Such an agent likely could be more specifically delivered into the lymphatic system and retained for longer periods of time in lymph nodes, which may improve the outcome of MRL.

In conclusion, contrast-enhanced MRL with commercially available low molecular weight contrast agents has significant limitations in clinical practice. The development of a macromolecule lymph-compatible contrast agent for contrast-enhanced MRL would reduce the image artifact of veins and improve the diagnosis of lymphatic circulation disorders in the clinical practice.

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Regarding "Predicted shortage of vascular surgeons in the United States: Population and workload analysis"

We applaud Satiani et al[1] for addressing the impending shortage of vascular surgeons in the United States. Attitudes of medical students and trainees are changing. This has at times been ascribed as a gender issue. Lifestyle and time for family is important to men and women in training and clearly has an effect on their career choice and type of practice. Although Newton et al[2] reported the proportion of women choosing a specialty with a controllable lifestyle increased from 18% in 1996 to 36% in 2003, the proportion of men choosing a controllable lifestyle increased from 28% in 1996 to 45% in 2003. In his Presidential address to the Eastern Vascular Surgery Society, Dr Perler surmised that "controllable lifestyle is more of an issue for men than for women."[3] We believe in 2009 that a controllable lifestyle is an equally important issue to men and women.

For several years now, women have comprised roughly 50% or more of graduating medical student classes, yet a mere 13.7% make up our current class of 2-year vascular surgery fellows. Although improvement has been seen with our integrated vascular residents, where 22% of residents are women, we still rank far below national standards. Conclusions quoted by Satiani et al[1] from McMurray et al[4] that the shortage of physicians is due to part-time work by women may be true in the United Kingdom but has not been demonstrated in the United States, let alone in vascular surgery.

Men and women in vascular surgery continue to strive for an optimal blend of career and family. And why shouldn't we? One would hope that we learn from the past how we can shape the future. Wearing the badge of dangerously long hours and going for days without seeing family is no longer tolerable or admirable by today's surgeons or patients. Trusting one's partners to form a cohesive team approach to vascular surgery is not gender-based.

The last statement by Satiani et al, "Persuading more medical students to choose Vascular Surgery, incentives to work in rural areas, job sharing, and encouraging less than full time equivalent Vascular Surgeons to continue to work longer or transition into office-practices must all be among innovative approaches to solving the shortage predicament ahead," goes a considerable distance in detailing what we can do as a society to bring improved care to each other and our patients.

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Regarding: "Carotid angioplasty and stenting in anatomically high-risk patients: Safe and durable except for radiation-induced stenosis"

Shin et al[1] described the technical feasibility and durability of CAS in supposed medically (MED; 132 patients) or anatomically (ANAT; 98 patients) high-risk patients using Sapphire criteria.[2] Innocent readers might hail CAS as the treatment of choice in the majority of these "high risk" patients.

The ANAT cohort (overall 30 day stroke/death rate 3%) comprised 16 (6%) patients with previous neck radiation, who showed an increased rate (22.2%) of restenosis. Surprisingly, the preprocedural cerebral status of these 16 patients was not reported separately, but less than one-third of the ANAT cohort had been symptomatic prior to carotid artery stenting (CAS). As in Sapphire,[2,3] "high risk for surgery" should not be mixed up with "high risk for stroke." Although a patient with asymptomatic >70% stenosis with previous radiation might be considered anatomically high risk, this patient is certainly not at high risk for stroke and should therefore not be offered high-risk (endovascular) carotid revascularization. The very same accounts for patients with asymptomatic restenosis following prior carotid endarterectomy (CEA), who comprised 70% of the ANAT cohort. At the level of perioperative risk as reported in Sapphire, all potential benefit from any intervention ceases, and neither surgery nor angioplasty can ever prevent long-term stroke in these asymptomatic patients.

Treating asymptomatic patients by CAS because of clinical factors that make them high risk for other events than stroke will do little to reduce the overall risk of stroke in the general population. Clinicians that uncritically implement CAS justified on Sapphire outcomes will not do their patients any service.

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Reply

I deplore the loss of the Age of Innocence. It is obvious to any "innocent" or open-minded reader that the purpose of this manuscript is not to endorse liberal use of carotid artery stenting (CAS) in asymptomatic patients, but simply to present our experience with patients with hostile neck undergoing CAS, and, in particular, in patients with radiation-induced stenosis. Contrary to the quoted 3% combined 30-day stroke/death rate, the actual rate in our anatomically high-risk cohort was 2%, which highlights that CAS can be performed safely in patients with hostile neck. In fact, this early outcome is within the recommended threshold of 3% combined stroke/death rate for carotid endarterectomy for asymptomatic carotid stenosis. To further correct the above letter, we do not