Potential of Newly Developed USPIO P904 in Detecting Lymph Node Metastasis

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Background
Recent analysis has shown that ultrasmall superparamagnetic iron oxide (USPIO) exemplified by ferumoxtran-10 (Sinerem) may detect focal cancer metastasis in the unswollen lymph nodes (1). Ferumoxtran-10 has shown a good performance in clinical trial; however, currently unavailable. P904 (Guerbet Laboratories, Paris, France) is a newly developed USPIO. According to the preceding in-vitro data, the incubated macrophages have shown more rigorous phagocytosis of the agents, and in-vivo studies have shown more rapid clearance from the blood stream as compared with ferumoxtran-10 (2).

Purpose
The purpose of our study was to test the in-vivo performance of P904 in detecting lymph node metastasis, and assess the potential of the agent as a second generation USPIO after ferumoxtran-10.

Materials & Methods
The procedures were admitted by the internal review board (IRB) of our university and all the procedures were done under the guidelines for ethical conduct in the care and use of laboratory animals in our animal research laboratory. Five tumor bearing rabbits were used for the study. For preparation of lymph node metastasis model, 2.5 kg (BW) of male Japanese white rabbits (SLC Inc., Shizuoka, Japan) were subcutaneously inoculated with 0.5 mL of VX2 tumor cell suspension (1 X 10⁶-7 cells/mL) at the instep of right hind limb. At two weeks after tumor cell implantation, ipsilateral popliteal lymph nodes were used for metastatic lymph node model, and the contralateral side for control. Imaging were performed on 3.0T Signa HDx (GEHC, WI, USA) with combined use of 8 ch knee coil under general anesthesia using 2.5% isoflurane inhalation (Escaen, Mylan Inc., NYSE, USA). Following T1 weighted localizers, the incubated macrophages

Conclusions
Newly developed USPIO P904 increased the contrast of metastatic foci in the rabbit lymph nodes at 3T.

References