

MRI Survey Results

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The final analysis of the tattoo/MRI survey is in! The results have been presented in a report, which will be sent this month to a journal widely-read in the radiology community known, oddly enough, as *Radiology*. I will give you a summary of the results here.

Of 3065 surveys distributed, 1037 (33.8%) were returned for analysis. Five surveys contained insufficient data for inclusion, leaving 1032 evaluable surveys for tabulation. Two subgroups were defined as those with cosmetic tattoos, but *without* a history of MR scan after tattooing (Non-MR Group) and those *with* a history of MR scan after tattooing (MR Group). The Non-MR Group consisted of 897 (86.9%) respondents, the MR Group 135 (13.1%). Fifty-nine members of the Non-MR Group reported having undergone MR scans before receiving cosmetic tattoos, thus 194 (18.8%) of the study population had received an MR scan. As you would expect, none of those who underwent MR scanning *before* cosmetic tattooing reported any adverse effects. Of the MR Group, 133 (98.5%) reported no acute symptoms during MR scanning. Two (1.5%) individuals reported acute symptoms during MR scanning. One experienced a "slight tingling" before scanning began; the other a "burning" sensation that began before entering the magnet and resolved by the end of the scan. Both women had blue-black periorbital tattoos and underwent MR scanning of the cervical spine. In neither case did the severity of symptoms warrant halting the procedure. Neither reported redness, edema, blisters or ulceration in the tattooed areas.

Four individuals (4.4%) reported "fading" of their tattoos after MR scanning. No acute symptoms were reported in these cases. These individuals had gray, brown or black eyelid, brow or lip tattoos. Only two underwent imaging of the tattooed area itself

Of the remaining 129 individuals in the MR Group, concurrent information on tattoo and MR sites were available for 124. Of these, 61 (49.20/o) had MR imaging encompassing the tattooed area or the area immediately adjacent to the tattoo. Information on tattoo

sites was available for 125 individuals who had 204 individual tattoos. Of these tattoos, 82 (40.2%) were eyelid, 73 (35.8%) eyebrow, 33 (16.1%) lip, 8 (3.9%) cheek, 4 (2.0%) areola, and 4 (2.0%) other tattoos. Fifty-nine (47.2%) individuals had more than one cosmetic tattoo. Information on tattoo pigment color was available for 113. Of these, 75 (66.4%) reported brown pigment, 52 (46.0%) black, 33 (29.2%) red, 11 (9.70/o) blue, 9 (8.0%) gray and 9 (8.0%) green. Other colors reported were yellow, orange, flesh and white. Ninety-one (80.5%) reported brown, red, or flesh pigments all of which typically contain iron oxide.

Taken together these data argue for a modification of current recommendations for those with tattoos undergoing MR imaging. Certainly radiologists should ask about a history of tattoos in each patient. The presence of cosmetic tattoos does not predict acute reactions during MR scanning. There exists a very small possibility that MRI of new tattoos, which have pigment still caught in the epidermis, could result in some loss of pigment onto the surface of the magnet. The presence of a tattoo less than one month old could logically form the basis of a temporary absolute contraindication to MR imaging. Acute symptoms occurring at any time prior to or during MR imaging should be answered by immediate cessation of scanning and removal of the patient from within the magnetic field. Tattoo artists should also modify how they inform their clients about MRI studies. Artists should be advised to avoid the use of iron oxide based pigment for eyeliner tattoos, since in this particular situation tattoo artifacts may render images unreadable. For iron oxide tattoos anywhere on the body, artists should inform their clientele there is a very small risk of transient tingling or burning reactions during MR imaging.

Many thanks to the SPCP members and their clients who participated in this study. Thanks also to the SPCP Board for providing funding for this survey. Without all of help, we would not have the concrete data with which we can now answer the concerns of our clients and their radiologists regarding this issue. As was always suspected, MRI procedures are not contra-indicated for permanent makeup clients and pose no serious risk to either the imaging equipment or persons receiving MR imaging.