Biocompatible Marker

Peripheral nerve injury is often followed by a highly variable recovery process with respect to both rapidity and efficacy. Identifying post-nerve injury phenomena is key to assessing the merit and timing of surgery as well as to tracking nerve recovery postoperatively. Diffusion Tensor Imaging (DTI) has been investigated in the clinical and research settings as a noninvasive technique to both assess and monitor each patient's unique case of peripheral nerve damage.i

Gullotti et al., identified a MRI-suitable marker for tracking the exact site of either nerve injury or coaptation following surgical repair to aid with DTI analysis.

Due to artefact and disruption of tractography, silver wire and microvascular clips were not suitable markers. AxoGuard®, 4-0 vicryl suture, and 10-0 polyamide suture, although detectable, did not produce a signal easily distinguished from post-surgical changes. Silicone was easily identifiable and stable in both the acute and delayed time points, exhibited negligible impact on DTI parameters, and possessed geometry to prevent nerve strangulation.

Prior studies have not assessed the efficacy of other markers nor have they assessed silicone for potential artefact with DTI parameter analysis. Furthermore, this work demonstrates the reliability and compatibility of silicone in the delayed postoperative time period and includes its unique imaging appearance on high-resolution 11.7 MRI.

Semi-cylindrical silicone tubing can be used as a safe, reliable, and readily available radiological marker to visualize and monitor a region of interest on a rodent's peripheral nerve for aiding assessments with diffusion tensor imaging [1)].

1)
Gullotti D, Mangraviti A, Zhang J, Volpin F, Fink G, Reiss R, Ahlawat S, Olivi A, Hoke A, Tyler B, Belzberg A. Evaluation of Select Biocompatible Markers for Labelling Peripheral Nerves on 11.7 T MRI. J Neurosci Methods. 2019 Jan 7. pii: S0165-0270(18)30417-5. doi: 10.1016/j.jneumeth.2018.12.019. [Epub ahead of print] PubMed PMID: 30630001.