

AbstractID: 2078 Title: 3-D Stereo-Reconstruction of a Mass of Radioactive Coils after Embolization of Cerebral Aneurysms

Endovascular treatment of cerebral aneurysms with radioactive coils may prevent recanalization after embolization. This strategy requires an accurate estimation of the volume of the mass of coils. The purpose of this work is to develop a computer program to estimate these volumes using only two orthogonal angiographic projections. The originality of the method resides in the direct reconstruction of two 3-D contours of the mass of coils and the variational interpolation of the 3-D surface in order to estimate its volume. Validated by a simulation, the reconstruction algorithms could estimate the enclosed volumes with an average error of 2.9% and a variability of 2.5%. In addition, the feasibility is also demonstrated using real clinical images. Results show that this reconstruction technique can quickly generate an accurate and realistic 3-D shape of the mass of coils during intervention without disturbing the clinicians working station. This 3D reconstruction method could also be used to perform real time x-ray navigation.