3D Slicer

- Augmented Reality for Identification of Temporal Bone Anatomy and Comparison to Conventional Imaging
- EASY Navigator: A Novel 3D Slicer-Based Neuronavigation System for Precise Brain Tumor Localization and Resection
- Volumetric changes in the bone flap at one year follow up in patients undergoing craniotomy
- BrainStereo: clinical application and efficiency evaluation of an open-source stereotactic planning tool
- Anatomical digital twins for medical education: a stepwise guide to create perpetual multimodal three-dimensional reconstruction of digital brain specimens
- Using baseline MRI radiomic features to predict the efficacy of repetitive transcranial magnetic stimulation in Alzheimer's patients
- From pixels to prognosis: leveraging radiomics and machine learning to predict IDH1 genotype in gliomas
- Impact of desmopressin on hematoma expansion in patients presenting to the emergency department on antiplatelet therapy: Don't expand study

3D Slicer (Slicer) is a free and open-source software package for image analysis and scientific visualization. Slicer is used in a variety of medical applications, including autism, multiple sclerosis, systemic lupus erythematosus, prostate cancer, schizophrenia, orthopedic biomechanics, COPD, cardiovascular disease and neurosurgery.

https://www.slicer.org/

Pre-operative 3D FLAIR images of 23 Low-grade gliomas LGGs were segmented three times in the software 3D Slicer. Tumor volumes were calculated, together with the absolute and relative difference between the segmentations. To quantify the intra-rater variability, they used the Jaccard coefficient comparing both two (J2) and three (J3) segmentations as well as the Hausdorff Distance (HD). The variability measured with J2 improved significantly between the two last segmentations compared to the two first, going from 0.87 to 0.90 ($p = 0.04$). Between the last two segmentations, larger tumors showed a tendency towards smaller relative volume difference ($p = 0.07$), while tumors with well-defined borders had significantly less variability measured with both J2 ($p = 0.04$) and HD ($p < 0.01$).

They found no significant relationship between variability and histological sub-types or Apparent Diffusion Coefficients (ADC). They found that the intra-rater variability can be considerable in serial LGG-segmentation, but the variability seems to decrease with experience and higher grade of border conspicuity. Thos findings highlight that some criteria defining tumor borders and progression in 3D volumetric segmentation is needed, if moving from 2D to 3D assessment of size and growth of LGGs [1].

1)

Bø HK, Solheim O, Jakola AS, Kvistad KA, Reinertsen I, Berntsen EM. Intra-rater variability in low-grade glioma segmentation. J Neurooncol. 2016 Nov 11. [Epub ahead of print] PubMed PMID: 27837437.