EmboASSIST a new software to help endovascular treatment of brain AVMs

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Introduction: EmboASSIST (GE Healthcare) is a new 3D visualization software dedicated to assist AVM embolization. It provides a one-click 3D segmentation of vascular anatomy from CBCT acquisition then dynamically track feeders and simulate virtual injections. These segmented feeders can be displayed on live fluoroscopy facilitating micro catheter navigation. Moreover, 3D MR acquisition may be automatically registered with CBCT acquisition and also displayed on live fluoroscopy.

Aim of the study: presentation and preliminary evaluation of Emboassist

Population and method: This software was evaluated in the endovascular treatment of 10 brain AVM in 10 patients between March and May 2021. There were 5 males, 5 females whose age varied from 13 to 64 yo (mean 38 yo). Six AVMs had bled previously. Location was supra-tentorial in 8 (3 in frontal lobe, 4 in parietal lobe and 1 in temporal lobe), and infra-tentorial in 2 (one mesencephalic and one cerebellar). Three AVMS were Spetzler Martin grade 1, three were grade 2 and four were grade 3. The evaluation was prospectively done using a short survey completed at the end of each treatment by 2 operators (SB, RA) using a 5 points Likert scale. This survey deals with the ease of use of Emboassist and the help provided 1st at the planning stage in understanding the angioarchitecture of the AVM especially the number of afferent pedicles and their course; and 2nd during the treatment itself by facilitating endovascular navigation, reducing needs of contrast media, radiation and procedure time

Results: EmboASSIST was considered to be quick and easy of use in all the cases. It helps to define feeding arteries, their number and their course in 8/10 AVMs. Used for micro catheter navigation on live fluoroscopy in 8 cases, Emboassist helped to visualize the path and to navigate in 5 cases. As a consequence, Emboassist was believed to reduce contrast media, radiation and procedure time and to increase safety of these five treatment.

Conclusion: EmboASSIST is easy to use and gives a quick and clear understanding of the afferent pedicles to the AVM. It helps to visualize their course and, by displaying them on live fluoroscopy, may facilitate microcatheter navigation.
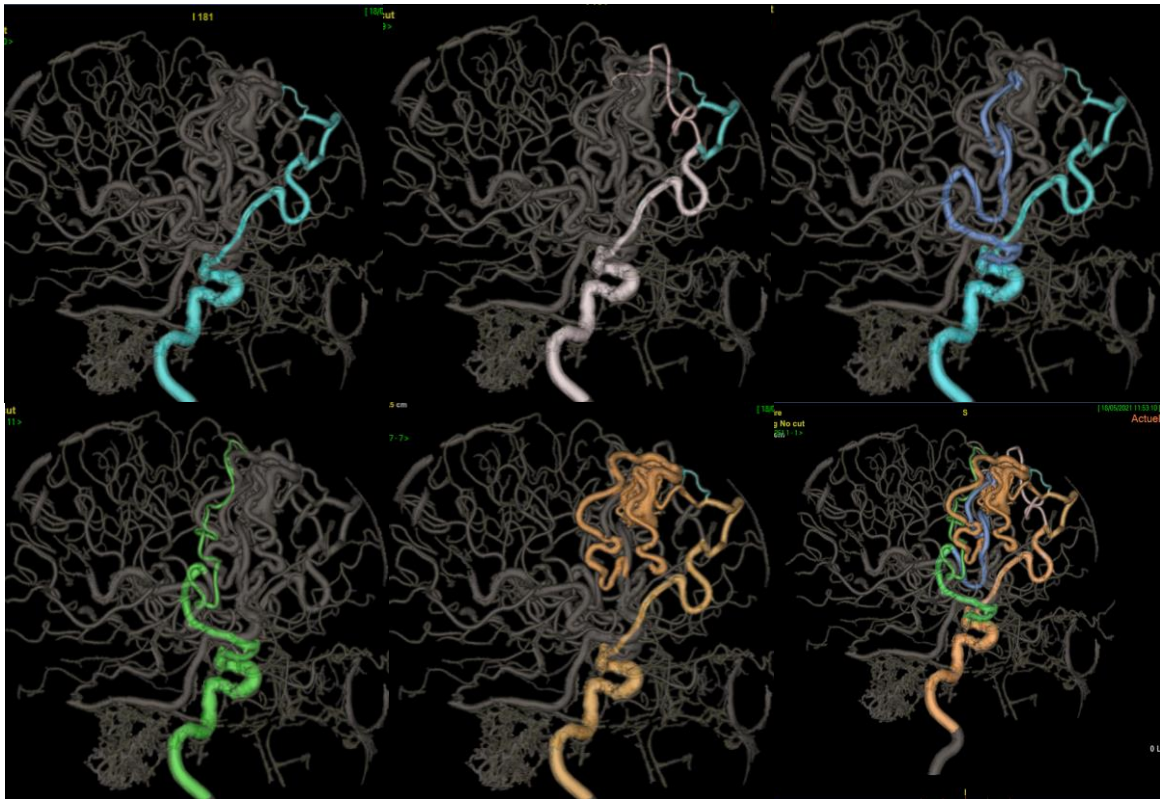
Illustrative cases:

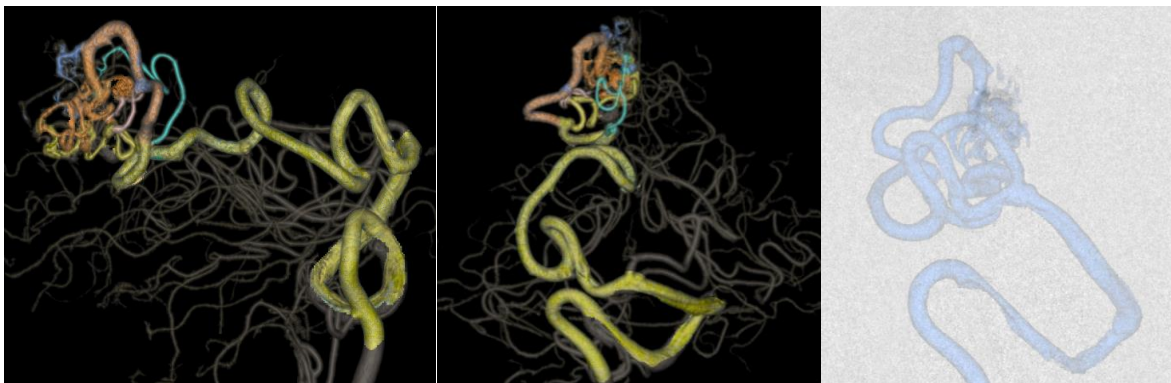Fig 1: Right frontal AVM. Different step of segmentation of arterial feeders

Fig 2: Right Parietal AVM. Analysis of arterial feeder with Emboassist. Microcatheter navigation and selective injection under fluoroscopy in an oblique view with segmented feeder displayed on screen.
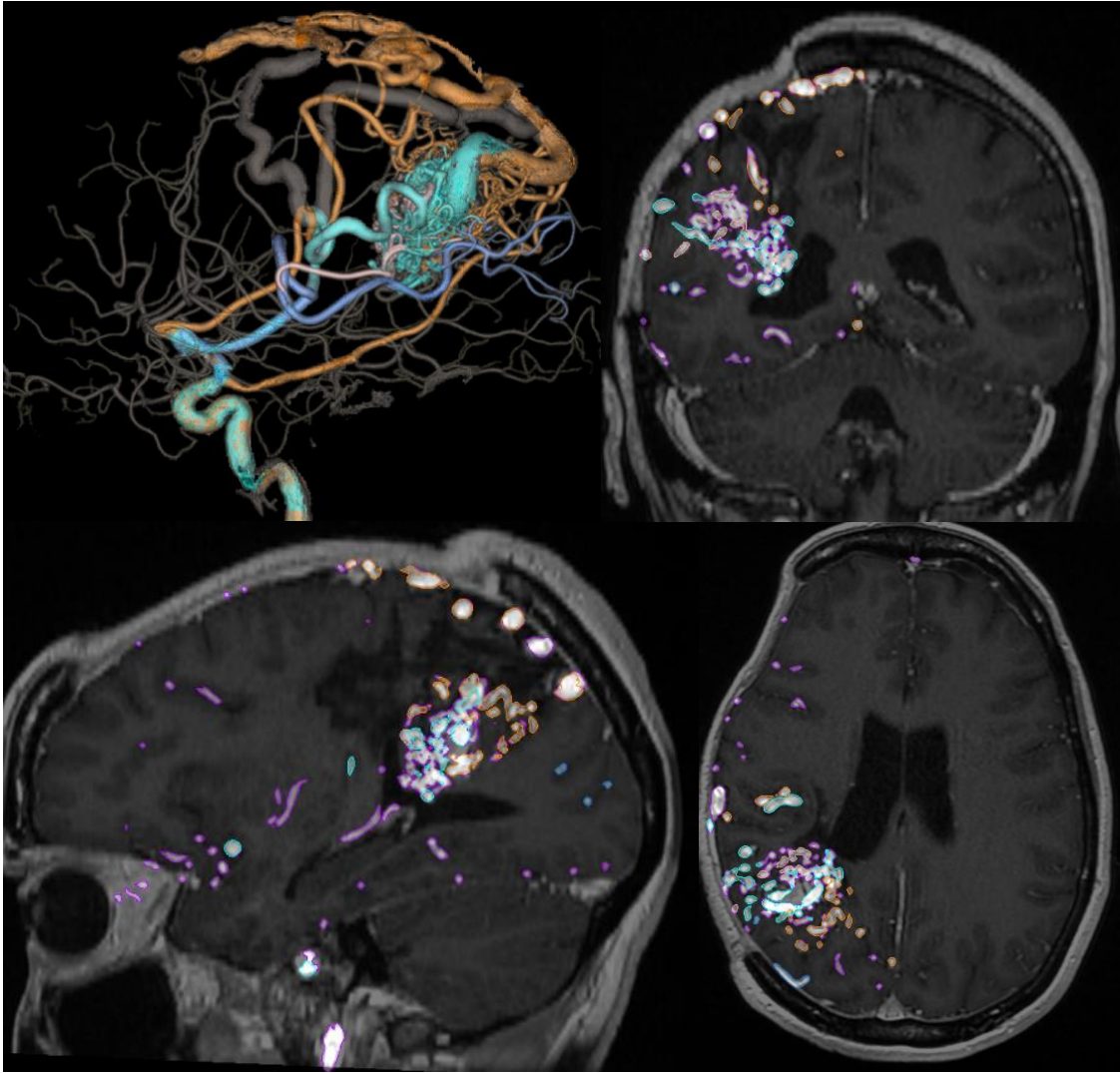
Figure 3 : Right parietal AVM. Registration with 3D T1 MRI