Bicêtre Occlusion Scale Score

The Woven EndoBridge (WEB) system is an innovative device under evaluation for its capacity to treat wide-neck Intracranial Bifurcation Aneurysm.

The WEB Occlusion Scale (WOS) [1], a Modified Raymond-Roy Classification inspired scale, is up to now the most frequently used for WEB angiographic evaluation, but it may not be optimal for this device. Indeed, the new concept of intrasaccular flow-disruption introduces new analytical issues, such as proximal recess appearance, residual filling of the WEB, and device compression [2].

The purpose of a study wass to evaluate the use of the different occlusion scales available in clinical practice.

Seven WEB-experienced neurointerventionalists were provided with 30 angiographic follow-up data sets and asked to grade each evaluation point according to the Bicêtre Occlusion Scale Score (BOSS), firstly based on DSA images only then using additional C-Arm VasoCT analysis. This BOSS evaluation was then converted into the WEB Occlusion Scale (WOS) and into a dichotomized scale (complete occlusion or not). To estimate the inter-rater agreement among the seven raters, an overall kappa coefficient [1] and its standard error (SE) were computed.

Using the five-grade BOSS, raters showed “moderate” agreement (kappa = 0.56). Using the three-grade WOS, agreement appeared slightly better (kappa = 0.59). Strongest inter-rater agreement was observed with a dichotomized version of the scale (complete occlusion or not), which enabled an “almost perfect” agreement (kappa = 0.88). VasoCT consistently enhanced the agreement particularly with regards depicting intra-WEB residual filling.

The WOS is a consistent means to angiographically evaluate the WEB device efficiency. But the five-grade BOSS scale allows to identify aneurysm subgroups with differing risks of recurrence and/or rehemorrhage, which needs to be separated especially at the initial phase of evaluation of this innovative device. The additional use of VasoCT allows better inter-rater agreement in evaluating occlusion and specially in depicting intra-WEB persistent filling [3] [4].

Grade 0 indicates complete occlusion.

Grade 0’ is similar but with opacification of the proximal recess and is also considered as complete occlusion.

Grade 1 signifies opacification inside the WEB.

Grade 2 denotes a neck remnant.

Grade 3 indicates an aneurysm remnant with contrast agent inside the sac between the wall and the WEB device. In grade 1 + 3, contrast agent is depicted inside and around the device

1)

Fiorella D, Arthur A, Byrne J, Pierot L, Molyneux A, Duckwiler G, Mccarthy T, Strother C (2014) Interobserver variability in the assessment of aneurysm occlusion with the WEB aneurysm

embolization system. J Neurointerv Surg:1-6. doi:10.1136/neurintsurg2014-011251
2)

Cognard C, Januel AC (2015) Remnants and recurrences after the use of the WEB intrasaccular device in large-neck bifurcation aneurysms. Neurosurgery 76(5):522–530. doi:10.1227/NEU.0000000000000669
3)

Caroff J, Mihalea C, Tuilier T, Barreau X, Cognard C, Desal H, Pierot L, Arnoux A, Moret J, Spelle L. Occlusion assessment of intracranial aneurysms treated with the WEB device. Neuroradiology. 2016 Sep;58(9):887-91. doi: 10.1007/s00234-016-1715-9. Epub 2016 Jun 16. PMID: 27312475.
4)

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