Unruptured intracranial aneurysm treatment decision

For a treatment decision of unruptured intracranial aneurysm, physicians and patients need to weigh the risk of treatment against the risk of hemorrhagic stroke caused by aneurysm rupture.

In a study of Detmer et al. Image segmentation data and patient information obtained from two patient cohorts including 203 patients with 249 aneurysms were used for patient-specific computational fluid dynamics simulations and subsequent evaluation of the statistical model in terms of accuracy, discrimination, and goodness of fit. The model's performance was further compared to a similarity-based approach for rupture assessment by identifying aneurysms in the training cohort that were similar in terms of intracranial aneurysm hemodynamics and shape compared to a given aneurysm from the external cohorts.

When applied to the external data, the model achieved a good discrimination and goodness of fit (area under the receiver operating characteristic curve AUC = 0.82), which was only slightly reduced compared to the optimism-corrected AUC in the training population (AUC = 0.84). The accuracy metrics indicated a small decrease in accuracy compared to the training data (misclassification error of 0.24 vs. 0.21). The model's prediction accuracy was improved when combined with the similarity approach (misclassification error of 0.14).

The model's performance measures indicated a good generalizability for data acquired at different clinical institutions. Combining the model-based and similarity-based approach could further improve the assessment and interpretation of new cases, demonstrating its potential use for clinical unruptured intracranial aneurysm rupture risk assessment [1].

Scores

see also Unruptured intracranial aneurysm treatment score.

Unruptured intracranial aneurysm repair is the most commonly performed procedure for the prevention of hemorrhagic stroke. Despite efforts to regionalize care in high-volume centers, overall results have improved little [2].

The management of small unruptured incidentally discovered intracranial aneurysms (SUIAs) is still controversial.

Despite large trials supporting the management of small asymptomatic aneurysms, most neurosurgeons internationally chooses to treat them with surgery or endovascular means. Since clinicians use a number of factors beyond the maximum diameter when considering treatment options, future trials should consider these factors in their design [3].

Once a decision has been made to treat an intact aneurysm, the best treatment remains uncertain. Both surgical and endovascular management strategies are commonly performed for these lesions.

No one knows how best to manage these patients (an estimated 2—5% of the adult population), but with the increasing accessibility of non-invasive imaging, physicians are increasingly faced with the

dilemma of what to do [4].

One stance maintains that the only acceptable rationale for a preventive treatment is randomised evidence that therapy does more good than harm. Thus, a randomised trial showing better outcomes for treated patients compared with conservatively managed patients would be necessary to justify invasive treatment of UIAs. However, this trial has not yet been successfully completed.

Posterior circulation in surgery, large aneurysms (>15 mm) in EVT, and stent- or balloon-assisted procedures in EVT were associated with the occurrence of complications. Poor clinical outcome (mRS of 3-6) was 0.8 % at hospital discharge.

1)
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