Three-dimensional computed tomography angiography

see also four dimensional computed tomography angiography.

Patients were studied with 3D-CTA after diagnosis of subarachnoid hemorrhage. If the study had an adequate quality and revealed an aneurysm congruent with the clinical findings or neurological examination and/or with the location of the bleeding on computed tomography (CT) scan an early microsurgical clipping of the lesion was done. When the quality of the 3D-CTA study was not adequate or the quality being adequate displayed no lesions or the findings were not accurate enough to warrant direct microsurgical treatment, the patient was studied with cerebral digital subtraction (DS) angiography. A total of 44 consecutive patients harbouring a total of 47 intracranial aneurysms diagnosed by 3D-CTA and without preoperative DS angiography were submitted to microsurgical clipping and included in the study.

The overall mortality was 15.9% and the favourable results evaluated 6 months after discharge by means of the Glasgow Outcome Scale reached 70.4%. All lesions were successfully clipped. Surgery was done a mean of 4.1 days after the admission bleeding. A total of four microlesions undiagnosed by 3D-CTA were found at surgery and clipped. Postoperative DS angiography and necropsy findings were also used as control of the 3D-CTA findings but no additional information was provided excepting the finding in DS angiography of an asymptomatic intracavernous aneurysm. Therefore the sensitivity of the 3D-CTA for diagnosis of symptomatic aneurysms was 100% and the overall sensitivity 90.4%.

González-Darder et al., have reached similar results in patients operated on with or without preoperative angiography. 3D-CTA provides very valuable anatomical information, which has an additional value in the microsurgical treatment of anterior communicating artery aneurysm complex. Finally, selected cases of ruptured intracranial aneurysms can be successfully managed with the preoperative information provided by 3D-CTA and without DS angiography [1].

The imaging findings in 28 patients with 28 Anterior communicating artery aneurysms facilitated early clipping. Based on these 3D CTA + 2D CT images, Wada et al., conducted aneurysm surgery, and successfully performed neck clipping via an anterior interhemispheric approach. The combination of Three dimensional computed tomography angiography (3D CTA) and 2D CT images is a feasible and useful method of image guidance for ACoA aneurysm microsurgery [2].

The orbitozygomatic approach (OZA) has been useful in accessing basilar apex aneurysms, especially in cases where it is in a high position, because this approach can facilitate upward and oblique viewing from below through the wide operative space.

However, the OZA needs additional removal of the orbital rim and zygomatic arch, in addition to standard pterional craniotomy, which increases invasiveness, the risk of facial nerve palsy, temporal muscle atrophy, and deformity after surgery, and results in an extended operative time. Appropriate selection of the OZA requires indications that have yet to be established. The trajectory to BX aneurysms in the interpeduncular or prepontine cisterns has been suggested to be related to not only

the height of the apex of the basilar artery (BA), but also the height and lateral breadth of the bifurcation of the internal carotid artery (ICA).

Simulation using 3D-CTA appears to be important for planning the surgical approach for the treatment of BX aneurysms [3].

1)
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3)
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