3D Rotational Angiography (3D-RA) can be applied to the cerebral venous system, producing 3D rotational venography (3D-RV) and cross-sectional reconstructions, which function as an adjunct to traditional 2D digital subtraction angiography.

Case series

2017

After querying the database of Baylor St. Luke's Medical Center in Houston, Texas, Srinivasan et al. reviewed the radiological and clinical data of patients who underwent 3D-RV. This modality was performed based on standard techniques for 3D-RA, with the catheter placed in the internal carotid artery and a longer x-ray delay calculated based on time difference between the early arterial phase and the venous phase.

Of the 12 cases reviewed, 5 patients had neoplasms invading a venous sinus, 4 patients with idiopathic intracranial hypertension required evaluation of venous sinus stenosis, 2 patients had venous diverticula, and 1 patient had a posterior fossa arachnoid cyst. The x-ray delay ranged from 7 to 10 seconds. The 3D-RV was used both for diagnosis and in treatment planning.

Three-dimensional RV and associated cross-sectional reconstructions can be used to assess the cerebral venous vasculature in a manner distinct from established modalities. Three-dimensional RV can be performed with relative ease on widely available biplane equipment, and data can be processed using standard software packages. The authors present the protocol and technique used along with potential applications to venous sinus stenosis, venous diverticula, and tumors invading the venous sinuses [1].

2007

Eighty-three sides in 63 patients (26 men, 37 women; mean, 56.5 years of age) were examined by using 3D rotational venography (3DRV).

The drainage patterns of the inferior petrosal sinus (IPS) could be classified into the following 6 types, with emphasis on the level of IPS-IJV junction: type A, the IPS drains into the jugular bulb in 1/83 sides (1.2%); type B, the IPS drains into the IJV at the level of the extracranial opening of the hypoglossal canal in 29/83 sides (34.9%); type C, the IPS drains into the lower extracranial IJV in 31/83 sides (37.3%); type D, the IPS forms a plexus and has multiple junctions to the IJV near the jugular foramen in 5/83 sides (6.0%); type E, the IPS drains directly into the vertebral venous plexus (VVP) with no connection to the IJV in 3/83 sides (3.6%); and type F, the IPS is absent in 14/83 sides (16.9%). Each type is also characterized by the way of anastomosis with the VVP.

This classification seemed to be rational from the embryologic viewpoint, and it may be useful in establishing treatment strategies that involve endovascular manipulation via the IPS [2].

1)
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2)
Mitsuhashi Y, Nishio A, Kawahara S, Ichinose T, Yamauchi S, Naruse H, Matsuoka Y, Ohata K, Hara M.

Morphologic evaluation of the caudal end of the inferior petrosal sinus using 3D rotational venography. AJNR Am J Neuroradiol. 2007 Jun-Jul;28(6):1179-84. PubMed PMID: 17569984.