Curved Planar Reformation

This method allows the visualization of entire tubular structures with minimal modification of the original data. The main application of this visualization method is Computed Tomography Angiography (CTA). CPR provides the possibility to visualize the interior of vascular structures (i.e., the lumen of the vessel). Direct volume rendering approaches and surface shaded display methods only provide the possibility to inspect the surface of vascular structures.

A study of Shibao et al., included 126 patients treated via the anterior transpetrosal approach (ATPA). The bridging vein (BV) and the tentorial sinus (TenS) located in the operative fields were analyzed. Furthermore, in the preoperative evaluation, the cross-sectional shapes of the intradural vein and the interdural sinus were analyzed by Curved Planar Reformation (CPR), and the flattening rate was calculated. Flattening rate = (a-b)/a = 1-b/a (a: long radius, b: short radius).

Seventeen BVs and 18 TenS were identified. The bridging site was divided into two groups: tentorial and middle fossa. The middle fossa group was divided into three subgroups: cavernous sinus, middle fossa dural sinus, and middle fossa dural adherence. Five isolated TenS were sacrificed and no venous complications were observed. The mean flattening rate was 0.13 in the intradural vein and 0.51 in the interdural sinus, respectively (P = 0.0003).

They showed classification of the BV, and preservation of the BV and TenS during the ATPA. Furthermore, they found that the interdural sinus was significantly flatter than the intradural veins. Measuring the flattening rate by CPR may be useful to identify BVs preoperatively [1].

The straightened CPR technique is useful for accurately identifying volume changes in hydromyelia, even in patients with severe scoliosis [2].

Curved planar reformation technique can be used for preoperative planning of cerebral bypass procedures and is a novel, inexpensive, and efficient means of determining the desired length and path of the bypass graft and in the evaluation of appropriate recipient vessels [3]

1)
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2)
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3)
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