Usefulness of two-dimensional time-of-flight MR angiography combined with surface anatomy scanning for convexity lesions

- Basant Pant M. D.,
- Masayuki Sumida,
- Kaoru Kurisu,
- Kazunori Arita,
- Fusao Ikawa,
- Keisuke Migita,
- Munenori Kutsuna &
- Tohru Uozumi

Neurosurgical Review **volume 20**, pages108–113 (1997)Cite this article

Abstract

Thirty-eight patients with convexity lesions were studied prospectively with the two-dimensional time-of-flight (2D-TOF) magnetic resonance angiography (MRA) method. Of these 21 cases had additional surface anatomy scanning (SAS) and 7 cases had three-dimensional phase contrast (3D-PC) MRA. The findings were compared during surgery, and the predictability of 2D-TOF evaluated. 2D-TOF was obtained with 2 mm slice thickness after the administration of contrast media for routine magnetic resonance imaging (MRI). Cortical veins were visualized with a good resolution with a scan time of only 5 minutes. The tumor was also visible in the background, due to enhancement, and thus the tumor-vessels relation was shown. Slow-flow vessels were also adequately seen. SAS was done at the same sitting with fast spin echo (FSE) with a scan time of 3 minutes. Once both images were incorporated, information on gyri and their relation to the lesions and vasculature could be obtained from a single image. We found 2D-TOF alone, or at times in combination with SAS, useful for planning of operation for convexity lesions.

References

1. AXEL L: Blood flow effects in magnetic resonance imaging. AJR 143 (1984) 1157–1166

   PubMed **Google Scholar**

2. BOSMANS H, G MARCHAL, G LUKITO, N YICHENG, G WILMS, G LAUB, AL BAERT Time-of-flight MR angiography of the brain: comparison of acquisition techniques in healthy volunteers. AJR 164 (1995) 161–167

   PubMed **Google Scholar**

3. BRADLEY WG, V WALUCH, KS LAI, EJ FERNANDEZ, C SPALTER: The appearance of rapidly flowing blood on magnetic resonance images. AJR 143 (1984) 1157–1174

   PubMed **Google Scholar**

4. DUMOULIN CL, HR HART Magnetic resonance angiography. Radiology 161 (1986) 717–720

   PubMed **Google Scholar**

5. DUMOULIN CL, SP SOUZA, MIT WALKER, W WAGLE: Three-dimensional phase contrast angiography. Magn Reson Med 9 (1989) 139–149

   PubMed **Google Scholar**

6. EDELMAN RR, KU WENTZ, H MATTEE, B ZHAO, C LIU, D KIM, G LAUB: Projection arteriography and venography: Initial clinical results with MR. Card Radiology 172 (1989) 351–357

   Google Scholar

7. EDELMAN RR, D CHIEN, DJ ATKINSON, J SANDSTORM: Fast time-of-flight MR angiography with improved background suppression. Radiology 179 (1991) 867–870

   PubMed **Google Scholar**

8. HUSTON J, DA RUFENACHT, RL EHMAN, DO WIEBERS: Intracranial aneurysms and vascular malformations: comparison of time-of-flight and phase-contrast MR angiography. Radiology 181 (1991) 721–730

PubMed **Google Scholar**

9. HUSTON J, RL EHMAN: Comparison of time-of-flight and phasecontrast MR neuroangiographic techniques. Radiographics 3 (1993) 5–19

Google Scholar

10. KATADA K: MR imaging of brain surface structures: Surface anatomy Scanning (SAS). Neuroradiology 32 (1990) 439–448

PubMed **Google Scholar**

11. KELLER PJ, BP DRAYER, EK FRAM, KD WILLIAMS, CL DUMOULIN, SP SOUZA: MR angiography with two-dimensional acquisition and three-dimensional display. Radiology 173 (1989) 527–532

PubMed **Google Scholar**

12. LEWIN JS, G LAUB: Intracranial MR angiography: A direct comparison of three time-of-flight techniques. AJNR 12 (1991) 1133–1139

PubMed **Google Scholar**

13. MATTLE HP, KU WENTZ, RR EDELMAN, B WALLNER, JP FINN, P BARNER, DJ ATKINSON, J KLEEFIELD, HM HOOGEWOUD: Cerebral venography with MR. Radiology 178 (1991) 453–458

PubMed **Google Scholar**

14. ROSEN BR: Projective imaging of pulsatile flow with magnetic resonance. Science 230 (1985) 946–948

PubMed **Google Scholar**

15. RUGGIER PM, AL GERHARD, TJ MASARYK, MT MODIC: Intracranialcirculation: pulse-sequence considerations in three-dimensional (volume) MR angiography. Radiology 171 (1989) 785–791

PubMed **Google Scholar**

16. SMITH KW: Time-of-flight methods in MR angiography. Radiol Technol 65 (1994) 159–170

PubMed **Google Scholar**

17. SUMIDA M, T UOZUMI, K KIYA, K ARITA, K KURISU, J ONDA, H SATOH, F IKAWA, O YUKAWA, K MIGITA, H HADA, K KATADA: Surface anatomy scanning (SAS) in intracranial tumors: comparison with Surgical findings. Neuroradiology 37 (1995) 94–98

PubMed **Google Scholar**