

THE ROLE OF MR TRACTOGRAPHY IN PRE-SURGICAL PLANNING – PERSONAL SERIES OF 25 CASES AND A REVIEW OF THE LITERATURE

Gutu Pavel, Malcoci Mihai

Academic adviser: Iliescu B., M.D., Ph.D.; Poata I., M.D., Ph.D., “Gr. T. Popa” University of Medicine and Pharmacy, Iasi, Romania

Introduction: Diffusion tensor imaging (DTI) contains a wealth of information on molecular diffusion in biological tissues. Knowledge of the topography, integrity, and involvement by the pathological process of the white matter tracts is an important factor in pre-surgical planning for patients with brain lesions. We have evaluated the clinical utility of a magnetic resonance tractography technique based on DTI

Materials and methods: We studied, in a prospective manner, 25 cases with lesions involving salient intracerebral and medullary tumors (22 and 3 cases respectively). All cases followed a preoperative imaging protocol that included DTI on top of the usual MR imaging protocol. We analyzed the DTI findings preoperatively and looked at the significant information that influences the surgical plan: position of the significant white matter tracts, the degree of their involvement in the pathological process and anatomical integrity, relationships with important anatomical landmarks and with the major surgical approach paths. We present the postoperative results and some of the most illustrative cases in the series and compare our results with the similar studies in the literature.

Results: Pathological examination of the resection specimens documented glioblastoma in twelve cases, grade one astrocytomas in five cases and grade two in one case, meningioma in five cases, mature teratoma and AVM in one case respectively. We managed to identify the degree of involvement of white matter tracts in all cases using DT imaging 2D maps and 3D reconstructions. Normal white matter tracts were highlighted in the controlateral hemisphere in all patients. Changes in tracts' structure and position were characterized for each patient.

Conclusion: Our experience, based on the results of the present study strongly suggests that in depth knowledge of the white matter tracts involvement in an intracerebral or intramedullary pathological process improves significantly the surgical planning in terms of surgical procedure safety and functional outcome.

Key words: diffusion-tensor imaging, white matter, pre-surgical planning.

COMPARATIVE STUDY OF MICROSURGERY AND GAMMA-KNIFE SURGERY IN PATIENTS WITH VESTIBULAR SCHWANNOMA

Malcoci Mihai, Gutu Pavel

Academic adviser: Bogdan Iliescu, M.D., Ph.D., Ion Poata, M.D., Ph.D., “Gr. T. Popa” University of Medicine and Pharmacy, Iasi, Romania

Introduction: Vestibular schwannomas (VSs) are benign neoplasms of Schwann cell origin. Although benign in nature, the treatment of vestibular schwannoma remains a challenge for modern neurosurgery. Patients with vestibular schwannomas have several management options including observation, surgical resection, stereotactic radiosurgery, fractionated radiation therapy, or combinations of these.

Material and methods: We study two patient groups that have been treated using either Gamma-Knife radiosurgery or microneurosurgery. We analyze the criteria for primary referral to one of the thera-