Radioguided surgery

Using microsurgical procedures without intraoperative imaging, Gross Total Resection (GTR) has so far only been achieved in less than 30% of all cases. Radio-guided surgery was introduced in the clinical setting in 1985 in an attempt to facilitate intraoperative tumor detection. Because of few studies in literature about this subject, we decided to use gamma probe with the hypothesis that we could increase extent of tumor resection. MATERIALS AND METHODS:

From January 2013 till February 2014, 22 patients with cerebral glioma were randomized equally into two groups and evaluated. In the first group, 370MBq of Technetiumc-99m was injected. The microsurgical resection of the tumor was performed as much as possible, and then the tumoral bed was examined, if the signal was more than 2 times of the background signal, more tissue resection performed if feasible until the signal was diminished. In the control group, conventional resection of the tumor was performed. The extent of tumor resection was assessed by contrast magnetic resonance imaging (MRI) study. RESULTS:

Before surgery the patients in the first group had average tumor volume of 81.68±9.78. In the second group the average tumor volume before surgery was 82.63±10.06cc. There is no significant difference between preoperative tumor volumes in two groups. In the first group, in the post-operative MRI, the tumor volume was 5.04±2.69cc and in the second group it was 9.5±4.8cc. Eight patients (72.7%) in the radioguided group experienced radical resection (more than 95%), but in the control group radical resection was achieved in just 3 patients (27.2%), radical resection was significantly higher in radioguided group (P<0.001). Due to the usage of the gamma detection probe, time of finding the tumor in the radioguided group was significantly less than control group (P=0.02). However total operation time in the radioguided group, was not significantly more than the control group (P=0.88). CONCLUSIONS:

Neuronavigation system increases the percentage of gross total resection, but it is expensive, increases duration of surgery is not considered a real-time assessment, and is not accurate in determining the borders of glioma due to brain shift. In contrast, radio-guided surgery is easy to use, real-time, not expensive, and increases the extent of tumor resection. [1)].

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Seddighi A, Akbari ME, Seddighi AS, Pirayesh E, Soleymani MM, Baqdashti HR, Nikouei A, Zali A, Tabatabaei SM, Naimian S, Mellati O, Sheikhi A. Radioguided surgery using gamma detection probe technology for resection of cerebral glioma. Hell J Nucl Med. 2015 Sep-Dec;18 Suppl 1:68-75. PubMed PMID: 26665214.