腦部分次立體定位放射治療對惡性膠狀瘤

Fractionated stereotactic radiotherapy for malignant glioma

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摘要

目的：本研究是以回溯分析法來進行，以評估腦部分次立體定位放射治療對惡性神經膠質瘤的影響的初步研究結果。材料與方法：1996 年 6 月至 1998 年 5 月的期間共有 37 位經組織診斷爲 WHO 分級 grade III 或Ⅳ神經膠質瘤病患、(17 位退化性星母細胞瘤，20 位多形神經膠母細胞瘤)在本院以腦部分次立體定位治療。先以體外放射線治療累積劑量至中值劑量 46 格雷時再以分次立體定位放射治療於腫瘤部位追加劑量，本院採用的立體定位技術爲先於頭部植入 3 顆金屬球當作參考點，輔以電腦立體定位系統作治療計劃。每日每次劑量爲 2.0 格雷至 3.0 格雷，治療 5 至 12 次，一般選擇以 1-2 個中心點， 4-8 個非共面弧來治療。利用 Kaplan-Meier 方法計算存活曲線，以單一變數與多重變數分析方式來測試不同預後因子與治療方式。結果：整體中值平均存活爲 22 個月， 1 年和 2 年存活率爲 60%和 30%。後續追蹤影像檢查顯示在 37 位病人中有 6 位病人(16%)腫瘤縮小大於 50% ；腫瘤縮小少於 50%或沒改變的有 14 位病人(38%) ，腫瘤有擴大的佔 17 位(46%)。分析不同預後因子，年齡(<50 歲)、手術切除範圓的大小、腫瘤的體積大小(<20ml) ，以單一變數分析時與增加存活有關(P<0.05)。多重變數分析時手術切除範圓大小、腫瘤的體積大小仍有統計學上的意義。所有病人在分次立體定位放射治療中情況穩定，只有 5 位病患(13%)產生急性毒性症狀但皆可藉由藥物得到良好的控制。結論：腦部分次立體定位放射治療，對於惡性神經膠質瘤的初步治療多形神經膠母細胞瘤病患無疑是一個提供安全且可行的治療方式。雖然對整體的存活率和 1 年存活率有幫助，但無法觀察到在整體存活率或無疾病惡化存活率有明顯的劑量效應關係。

Abstract

Purpose: This study is a retrospective analysis to evaluate the impact of fractionated stereotactic radiotherapy (FSRT) on malignant glioma. Material and Methods: Between June 1996 and May 1998, 37 patients with histology-cally proven WHO grade III or IV glioma (17 Anaplastic astrocytoma, 20 Glioblastoma multiforme) were treated at Taipei

Medical University hospital with FSRT. External beam radiotherapy (EBRT) delivered a median dose of 46 Gy which is followed by stereotactic radiotherapy. A frameless fractionated stereotactic radiotherapy was used to boost the tumor bed, using daily fraction of 2.0 -3.0 Gy for 5 to 12 fractions. Non-coplanar arcs (4-8 arcs, median 4 arcs) with 1 to 2 isocenters were mostly used. Survival curves were calculated using the Kaplan-Meier method. Prognostic factors and different treatment variables were tested by univariate and multivariate analysis. Results: Overall median survival was 22 months. One year and 2-year survival rate were 60% and 30% respectively. Follow up imaging study showed tumor reduction greater than 50% in 6 patients (16%), reduction less than 50% or unchanged in 14 patients (38%) and progression in 17 of the 37 patients (46%). On analysis of different prognostic factors, patient's age (<50 years and≧50 years), extent of surgical resection, and tumor volume (<20 ml) were correlated with survival in univariate analysis ($p<0.05$). Tumor volume and extent of surgical resection remained significant in multivariate analysis. The performance status remained stable for all patients during FSRT and only 5 patients (13%) suffered from treatment related acute toxicity with good medication control. Conclusion: Fractionated stereotactic radiotherapy provides a safe and feasible technique in the primary treatment of malignant gliomas. Although the overall survival and 1 year survival is encouraging, we did not observe a significant dose-effect relationship on overall and progression-free survival. Large series study with long term fallow-up is indicated