Comparison of Outcome Following Stereotactic Radiosurgery Versus Conventional Radiation Therapy for Metastatic Spinal Tumors: A Meta-analysis of 233 Patients.

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Introduction

In comparison with conventional radiotherapy (cRT), Stereotactic radiosurgery (SRS) can deliver precisely-targeted radiation in higher dosage in fewer fractions to the tumor bed while sparing the surrounding healthy tissue. However, its application in spine metastasis is currently not as well characterized as in brain tumors.

Methods

With compliance to the PRISMA guidelines, the MEDLINE database was utilized to search for studies that compared clinical outcome and adverse events of SRS with cRT. A meta-analysis was then performed through a random-effects model and results were interpreted with odd ratios (OR) and 95% confidence interval (CI). Forest plots were constructed for each variable of interest.

Results

5 retrospective matched-pair studies were included in our meta-analysis. A total of 233 patients were stratified into SRS (n=120) and cRT (n=113) groups respectively. The average ages of both groups were comparable with length of follow-up up to 49 months. The most common histology type was hepatocellular carcinoma (55%). The utilized dosage varied across the studies. The SRS group has higher rate pain control (OR 1.86; CI 0.72-4.82; p=0.2). The incidence of acute toxicity (i.e nausea, vomiting and esophagitis etc.) was lower in the SRS group (OR 0.33; CI 0.14-0.76;p=0.009). De novo compression fracture of the irradiated area was significantly higher in the SRS group (OR 5.4; CI 1.32-22.17; p=0.02). However only 33% of such fractures in the SRS required further intervention (kyphoplasty/vertebroplasty) compared to 50% in the cRT group.

Conclusions

Stereotactic radiosurgery provides promising treatment modality for patients with spine metastases. From our analysis, we demonstrated that SRS contributed to better pain control although being not statically significant. Despite the higher dosage in the SRS group, acute toxicity and incidence of compression fracture requiring further interventions were lower when compared to the cRT group.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the efficacy of radiosurgery in treating spinal metastasis. 2) To recognize the adverse effects of radiosurgery.