

INPLASY

Dosimetric comparison between helical Tomotherapy vs volumetric arc therapy for nasopharyngeal cancer: Systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - Taipei City Hospital.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 July 2024 and was last updated on 07 July 2024.

INTRODUCTION

Review question / Objective This study evaluates the application of (helical Tomotherapy, HT) and (volumetric arc therapy, VMAT) techniques in the treatment of nasopharyngeal carcinoma, using existing dosimetric studies for comparison.

Rationale We used medical repositories to search for required studies. Use Comprehensive Meta-Analysis software to quantify research results.

Condition being studied In summary, both HT and VMAT have their respective advantages in the treatment of nasopharyngeal carcinoma, and the choice of treatment technique should be based on specific clinical circumstances.

METHODS

Search strategy ("nasopharyngeal carcinoma") AND ("volumetric-modulated arc therapy") OR ("helical tomotherapy")

PubMed、Cochrane Library、Web of Science 和 Google scholar.

Participant or population Patients with primary nasopharyngeal carcinoma. The critical organs of the studied cases were normal before treatment.

Intervention Helical Tomotherapy, HT and volumetric modulated arc therapy, VMAT.

Comparator Helical Tomotherapy, HT.

Study designs to be included Patients with primary nasopharyngeal carcinoma. The critical organs of the studied cases were normal before treatment.

Eligibility criteria Exclusion criteria: Reviews, case reports, abstracts, lecture materials. Non-double arc radiotherapy techniques.

Information sources PubMed、Cochrane Library、Web of Science and Google scholar.

Main outcome(s) The volume coverage rate, dose conformity (CI), and dose uniformity (HI) of HT in PTV have been proven to be statistically significant and superior to VMAT. In terms of protecting normal tissues, including the brainstem and spinal cord, and the left and right lenses, HT is also better than VMAT.

Quality assessment / Risk of bias analysis We use Newcastle-Ottawa quality assessment Scale(NOS) as a quality assessment tool for retrospective papers. The total NOS assessment result is 6-8. The quality of the paper is medium to high.

Strategy of data synthesis Comprehensive Meta-Analysis software (version 3, Biostat, Englewood, NJ, United States). A two-tailed p value of less than 0.05 was considered statistically significant. We used Hedges' g and 95% confidence intervals (CIs) to quantify the primary study outcomes. Odds ratios (ORs) and their associated 95% CIs were evaluated to investigate secondary outcomes. I² and Cochran's Q statistics were also examined to evaluate the degree of heterogeneity across studies.

Subgroup analysis VMAT reduces dose output and shortens treatment time, and is better than HT in protecting the optic chiasm and left and right optic nerves.

Sensitivity analysis Sensitivity analysis found that deleting any one of the papers would not change the overall effect.

Language restriction No language restrictions were applied to this search.

Country(ies) involved Taiwan/Taipei City Hospital.

Keywords Helical Tomotherapy, volumetric arc therapy, nasopharyngeal carcinoma, meta-analysis.

Contributions of each author

Author 1 - PEI-YU WANG - Data curation, formal analysis, investigation, methodology, software, writing the original draft.

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