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Assessment of Target Definition for Stereotactic Body Radiation Therapy (SBRT) of Pelvic Lymph Node Metastases from Extensive Stage Small Cell Lung Cancer (ES-SCLC)

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Abstract

Objective: Pelvic lymph nodes represent a potential site for metastatic involvement in patients with Small Cell Lung Cancer (SCLC), particularly in the setting of oligometastatic disease, and the use of advanced local therapies such as Stereotactic Body Radiation Therapy (SBRT) in carefully selected cases has gained increasing clinical attention in recent years. SBRT allows delivery of high radiation doses with sub-millimeter accuracy while minimizing exposure to adjacent normal tissues, making it a potentially effective tool for managing metastatic pelvic lymph nodes in Extensive Stage Small Cell Lung Cancer (ES-SCLC). In this study, we aimed to evaluate target volume definition for SBRT in the management of ES SCLC-related pelvic lymph node metastases through a comparative analysis of Computed Tomography (CT) and Magnetic Resonance Imaging (MRI).

Materials and methods: We performed a comparison for assessment of target definition by CT-simulation images only vs CT-MRI based target definition.

Results: As the result of this study, we found differences between target definition by CT-simulation images only vs CT-MRI based target definition. These variations highlighted the importance of integrating both imaging modalities for accurate target definition. Consequently, fused CT-MRI datasets were employed to establish the most accurate and clinically relevant target definition-our defined "ground truth" for SBRT planning.

Conclusion: While our findings support the value of CT-MRI fusion in target definition, larger studies are needed to validate these results and refine consensus guidelines for SBRT planning in this clinical scenario.

Keywords: Pelvic Lymph Node Metastases; Stereotactic Body Radiation Therapy (SBRT); Target Definition; Small Cell Lung Cancer (SCLC)

Abbreviations: SCLC: Small Cell Lung Cancer; IMRT: Intensity-Modulated Radiotherapy; stereotactic techniques, ART: Adaptive Radiotherapy; CT: Computed Tomography; MRI: Magnetic Resonance Imaging; AAPM: Association of Physicists in Medicine; ICRU: International Commission on Radiation Units and Measurements; HU: Hounsfield Units

Introduction

Pelvic lymph nodes represent a potential site for metastatic involvement in patients with Small Cell Lung Cancer (SCLC), particularly in the setting of oligometastatic disease, and the use of advanced local therapies such as Stereotactic Body Radiation Therapy (SBRT) in carefully selected cases has gained increasing clinical attention in recent years [1-7]. Rapid technological developments have greatly enhanced the precision and effectiveness of modern radiotherapy. Advances include automatic segmentation, molecular imaging, Image-Guided Radiotherapy (IGRT), Intensity-Modulated Radiotherapy (IMRT), stereotactic techniques, and Adaptive Radiotherapy (ART) [8-49].

SBRT allows delivery of high radiation doses with sub-millimeter accuracy while minimizing exposure to adjacent normal tissues, making it a potentially effective tool for managing metastatic pelvic lymph nodes in SCLC. In this study, we aimed to evaluate the determination of target volume for SBRT in the management of ES SCLC-related pelvic lymph node metastases through a comparative analysis of Computed Tomography (CT) and Magnetic Resonance Imaging (MRI).

Materials and Methods

At the Department of Radiation Oncology, University of Health Sciences, we have long served a large and diverse patient population, both from within Turkey and internationally. With a robust infrastructure for state-of-the-art radiotherapy, including SBRT, we routinely treat various benign and malignant tumors. For the present analysis, we focused on ES-SCLC patients presenting with pelvic lymph node metastases, referred to our center for SBRT. The primary aim was to compare target definition based on CT simulation images only versus CT-MRI fusion-based imaging.

All patients underwent simulation with a dedicated CT simulator (GE Lightspeed RT, GE Healthcare, UK), and MRI was available for all patients. Rigid patient immobilization was ensured during simulation, and the acquired CT datasets were transferred to a dedicated contouring workstation. Structure sets including target and organs at risk (OARs) were outlined. Then, a comparison was performed for assessment of target definition by CT-simulation images only vs CT-MRI based target definition. All treatment plans were performed using a Linear Accelerator (Synergy, Elekta, UK) capable of IGRT. Patients were treated at the Department of Radiation Oncology, Gulhane Medical Faculty, University of Health Sciences.

Results

This study was aimed at evaluation of target definition for SBRT of pelvic lymph node metastases from ES-SCLC with comparative analysis of CT and MRI. Stereotactic irradiation procedures were carried out at our Radiation Oncology Department of Gulhane Medical Faculty at University of Health Sciences, Ankara. All patients underwent comprehensive pre-treatment evaluation by a multidisciplinary tumor board, including specialists in medical oncology, radiation oncology, and surgical oncology. SBRT plans were developed according to established guidelines from the American Association of Physicists in Medicine (AAPM) and the International Commission on Radiation Units and Measurements (ICRU).

Radiotherapy physicists accounted for key imaging parameters such as tissue heterogeneity, CT number, electron density, and Hounsfield Units (HU) to ensure accurate dose calculations. The overarching goal was to achieve optimal tumor coverage while adhering strictly to normal tissue dose constraints. As the result of this study, we found differences between target definition by CT-simulation images only vs CT-MRI based target definition. These variations highlighted the importance of integrating both imaging modalities for accurate volume determination. Consequently, fused CT-MRI datasets were employed to establish the most accurate and clinically relevant treatment volume-our defined “ground truth” for SBRT planning.

We considered the reports by American Association of Physicists in Medicine (AAPM) and International Commission on Radiation Units and Measurements (ICRU) for optimal SBRT planning. Radiation physicists took part in generation of SBRT treatment plans by considering relevant normal tissue dose constraints. Tissue heterogeneity, electron density, CT number and HU values in CT images have also been considered by radiation physicists for precise SBRT planning. Main goal of SBRT planning was to achieve optimal treatment volume coverage without violation of normal tissue dose constraints. IGRT techniques including kilovoltage cone beam CT has been utilized, and SBRT was delivered by Synergy (Elekta, UK) LINAC. We found that CT and CT-MRI fusion defined target volumes showed differences as an important result of this current study. Considering this, we made use of fused CT and MRI for ground truth target definition for SBRT of pelvic lymph node metastases from ES-SCLC.

Discussion

SCLC is an aggressive malignancy known for its rapid dissemination and tendency for early metastasis. While systemic treatment remains the backbone of therapy, the emerging concept of oligometastatic SCLC has opened a window for incorporating local ablative strategies such as SBRT. Pelvic lymph node involvement, although less common than thoracic spread, poses unique treatment challenges given the complex anatomy and proximity to radiosensitive structures. Modern SBRT platforms, when guided by accurate imaging and immobilization, offer the capability to deliver ablative doses with steep dose gradients, enabling effective treatment of small-volume disease while sparing adjacent organs. However, precise target definition remains critical to achieving favorable outcomes and avoiding unnecessary toxicity.

Pelvic lymph nodes represent a potential site for metastatic involvement in patients with SCLC, particularly in the setting of oligometastatic disease and the use of advanced local therapies such as SBRT in carefully selected cases has gained increasing clinical attention in recent years [1–7]. Rapid technological developments have greatly enhanced the precision and effectiveness of modern radiotherapy. Advances include automatic segmentation, molecular imaging, IGRT, IMRT, stereotactic techniques, and ART [8-49]. SBRT allows delivery of high radiation doses with sub-millimeter accuracy while minimizing exposure to adjacent normal tissues, making it a potentially effective tool for managing metastatic pelvic lymph nodes in SCLC.

In this study, we aimed to evaluate the determination of target volume for SBRT in the management of ES SCLC-related pelvic lymph node metastases through a comparative analysis of CT and MRI. This study demonstrated measurable differences between CT and CT-MRI fusion-based target definition for SBRT of pelvic lymph node metastases from ES-SCLC. Differences in target definition may partly be explained by differences in soft tissue contrast, spatial resolution, or delineation practices across modalities. Fused CT-MRI imaging proved advantageous in

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reconciling these differences, suggesting that multimodal imaging should be considered standard for target delineation in such cases.

Over- or underestimation of treatment volumes can have serious clinical implications-either by increasing toxicity or compromising disease control. Therefore, effective cancer management is critical from the perspective of public health, and integration of multimodality imaging along with adaptive strategies may play a critical role in personalizing SBRT for pelvic lymph node metastases from ES-SCLC as also suggested by other studies [50–112]. While our findings support the value of CT-MRI fusion in target definition, larger studies are needed to validate these results and refine consensus guidelines for SBRT planning in this clinical scenario.

References

1. Siegel RL, Kratzer TB, Giaquinto AN, Sung H, Jemal A (2025) Cancer statistics, 2025. CA Cancer J Clin 75(1): 10-45.
2. Hasan N, Yazdanpanah O, Harris JP, Nagasaka M (2025) Consolidative radiotherapy in oligometastatic and oligoprogressive NSCLC: A systematic review. Crit Rev Oncol Hematol 210: 104676.
3. Naeem W, Khan AA, Adebayo OW, Ansari M, Geissen N, et al. (2025) Difficult Decisions in the Multidisciplinary Treatment of Resectable Non-small Cell Lung Cancer. Ann Surg Oncol 32(7): 4633-4640.
4. Weichselbaum RR, Hellman S (2011) Oligometastases revisited. Nat Rev Clin Oncol 8(6): 378-382.
5. Kim SS, Cooke DT, Kidane B, Tapias LF, Lazar JF, et al. (2025) The Society of Thoracic Surgeons Expert Consensus on the Multidisciplinary Management and Resectability of Locally Advanced Non-small Cell Lung Cancer. Ann Thorac Surg 119(1): 16-33.
6. 6. Jeon H, Wang S, Song J, Gill H, Cheng H (2025) Update 2025: Management of Non-Small-Cell Lung Cancer. Lung 203(1): 53.
7. Liu L, Mao Y, Guo L, Li C, Wang Y (2025) Advances in adjuvant therapy for operable N2 non-small cell lung cancer: a narrative review. Front Oncol 14: 1523743.
8. Sager O, Dincoglan F, Demiral S, Uysal B, Gamsiz H, et al. (2023) Adaptive radiation therapy (art) for patients with limited-stage small cell lung cancer (LS-SCLC): A dosimetric evaluation. Indian J Cancer 60(1): 140-147.
9. Gamsiz H, Sager O, Uysal B, Dincoglan F, Demiral S, et al. (2023) Outcomes of Sterotactic Body Radiotherapy (SBRT) for pelvic lymph node recurrences after adjuvant or primary radiotherapy for prostate cancer. J Cancer Res Ther 19(Suppl 2): S851-S856.
10. Gamsiz H, Sager O, Uysal B, Dincoglan F, Demiral S, et al. (2022) Active breathing control guided stereotactic body ablative radiotherapy for management of liver metastases from colorectal cancer. Acta Gastroenterol Belg 85(3): 469-475.
11. Sager O, Dincoglan F, Demiral S, Uysal B, Gamsiz H, et al. (2022) Concise review of radiosurgery for contemporary management of pilocytic astrocytomas in children and adults. World J Exp Med 12(3): 36-43.
12. Sager O, Dincoglan F, Demiral S, Gamsiz H, Uysal B, et al. (2022) Optimal timing of thoracic irradiation for limited stage small cell lung cancer: Current evidence and prospects. World J Clin Oncol 13(2): 116-124.
13. Demiral S, Sager O, Dincoglan F, Uysal B, Gamsiz H, et al. (2021) Evaluation of breathing-adapted radiation therapy for right-sided early stage breast cancer patients. Indian J Cancer 58(2): 195-200.
14. Sager O, Dincoglan F, Demiral S, Uysal B, Gamsiz H, et al. (2021) Omission of Radiation Therapy (RT) for Metaplastic Breast Cancer (MBC): A Review Article. International Journal of Research Studies in Medical and Health Sciences 6(1): 10-15.
15. Sager O, Dincoglan F, Demiral S, Uysal B, Gamsiz H, et al. (2021) Concise review of stereotactic irradiation for pediatric glial neoplasms: Current concepts and future directions. World J Methodol 11(3): 61-74.
16. Sager O, Dincoglan F, Demiral S, Uysal B, Gamsiz H, et al. (2020) Adaptive radiation therapy of breast cancer by repeated imaging during irradiation. World J Radiol 12(5): 68-75.
17. Sager O, Beyzadeoglu M, Dincoglan F, Demiral S, Gamsiz H, et al. (2020) Multimodality management of cavernous sinus meningiomas with less extensive surgery followed by subsequent irradiation: Implications for an improved toxicity profile. J Surg Surgical Res 6: 056-061.
18. Beyzadeoglu M, Sager O, Dincoglan F, Demiral S, Uysal B, et al. (2020) Single Fraction Stereotactic Radiosurgery (SRS) versus Fractionated Stereotactic Radiotherapy (FSRT) for Vestibular Schwannoma (VS). J Surg Surgical Res 6: 062-066.
19. Dincoglan F, Beyzadeoglu M, Sager O, Demiral S, Uysal B, et al. (2020) A Concise Review of Irradiation for Temporal Bone Chemodectomas (TBC). Arch Otolaryngol Rhinol 6: 016-020.
20. Sager O, Dincoglan F, Demiral S, Uysal B, Gamsiz H, et al. (2019) Utility of Molecular Imaging with 2-Deoxy-2-[Fluorine-18] Fluoro-DGlucose Positron Emission Tomography (18F-FDG PET) for Small Cell Lung Cancer (SCLC): A Radiation Oncology Perspective. Curr Radiopharm 12(1): 4-10.
21. Dincoglan F, Sager O, Demiral S, Gamsiz H, Uysal B, et al. (2019) Fractionated stereotactic radiosurgery for locally recurrent brain metastases after failed stereotactic radiosurgery. Indian J Cancer 56(2): 151-156.
22. Sager O, Dincoglan F, Demiral S, Uysal B, Gamsiz H, et al. (2019) Breathing adapted radiation therapy for leukemia relapse in the breast: A case report. World J Clin Oncol 10(11): 369-374.
23. Dincoglan F, Sager O, Uysal B, Demiral S, Gamsiz H, et al. (2019) Evaluation of hypofractionated stereotactic radiotherapy (HFSRT) to the resection cavity after surgical resection of brain metastases: A single center experience. Indian J Cancer 56(3): 202-206.
24. Sager O, Dincoglan F, Uysal B, Demiral S, Gamsiz H, et al. (2018) Evaluation of adaptive radiotherapy (ART) by use of replanning the tumor bed boost with repeated computed tomography (CT) simulation after whole breast irradiation (WBI) for breast cancer patients having clinically evident seroma. Jpn J Radiol 36(6): 401-406.
25. Demiral S, Dincoglan F, Sager O, Uysal B, Gamsiz H, et al. (2018) Contemporary Management of Meningiomas with Radiosurgery. Int J Radiol Imaging Technol 80: 187-190.
26. Sager O, Dincoglan F, Uysal B, Demiral S, Gamsiz H, et al. (2017) Splenic Irradiation: A Concise Review of the Literature. J App Hem Bl Tran 1: 101.
27. Dincoglan F, Sager O, Demiral S, Uysal B, Gamsiz H, et al. (2017) Radiosurgery for recurrent glioblastoma: A review article. Neurol Disord Therap 1: 1-5.
28. Demiral S, Dincoglan F, Sager O, Gamsiz H, Uysal B, et al. (2016) Hypofractionated stereotactic radiotherapy (HFSRT) for who grade I anterior clinoid meningiomas (ACM). Jpn J Radiol 34(11): 730-737.

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DOI: 10.19080/CTOIJ.2025.30.556280

29. Dincoglan F, Beyzadeoglu M, Sager O, Demiral S, Gamsiz H, et al. (2015) Management of patients with recurrent glioblastoma using hypofractionated stereotactic radiotherapy. Tumori 101(2): 179-184.

30. Gamsiz H, Beyzadeoglu M, Sager O, Demiral S, Dincoglan F, et al. (2015) Evaluation of stereotactic body radiation therapy in the management of adrenal metastases from non-small cell lung cancer. Tumori 101(1): 98-103.

31. Sager O, Beyzadeoglu M, Dincoglan F, Demiral S, Uysal B, et al. (2015) Adaptive splenic radiotherapy for symptomatic splenomegaly management in myeloproliferative disorders. Tumori 101(1): 84-90.

32. Sager O, Dincoglan F, Beyzadeoglu M (2015) Stereotactic radiosurgery of glomus jugulare tumors: Current concepts, recent advances and future perspectives. CNS Oncol 4(2): 105-114.

33. Sager O, Beyzadeoglu M, Dincoglan F, Uysal B, Gamsiz H, et al. (2014) Evaluation of linear accelerator (LINAC)-based stereotactic radiosurgery (SRS) for cerebral cavernous malformations: A 15-year single-center experience. Ann Saudi Med 34(1): 54-58.

34. Demiral S, Beyzadeoglu M, Sager O, Dincoglan F, Gamsiz H, et al. (2014) Evaluation of Linear Accelerator (Linac)-Based Stereotactic Radiosurgery (Srs) for the Treatment of Craniopharyngiomas. UHOD-Uluslararasi Hematoloji Onkoloji Dergisi 24(2): 123-129.

35. Sager O, Beyzadeoglu M, Dincoglan F, Gamsiz H, Demiral S, et al. (2014) Evaluation of linear accelerator-based stereotactic radiosurgery in the management of glomus jugulare tumors. Tumori 100(2): 184-188.

36. Ozsavaş EE, Telatar Z, Dirican B, Sager O, Beyzadeoğlu M (2014) Automatic segmentation of anatomical structures from CT scans of thorax for RTP. Comput Math Methods Med 2014: 472890.

37. Demiral S, Beyzadeoglu M, Sager O, Dincoglan F, Gamsiz H, et al. (2014) Evaluation of linear accelerator (linac)-based stereotactic radiosurgery (srs) for the treatment of craniopharyngiomas. UHOD - Uluslararasi Hematoloji-Onkoloji Dergisi 24: 123-129.

38. Gamsiz H, Beyzadeoglu M, Sager O, Dincoglan F, Demiral S, et al. (2014) Management of pulmonary oligometastases by stereotactic body radiotherapy. Tumori 100(2): 179-183.

39. Dincoglan F, Sager O, Gamsiz H, Uysal B, Demiral S, et al. (2014) Management of patients with ≥ 4 brain metastases using stereotactic radiosurgery boost after whole brain irradiation. Tumori 100(3): 302-306.

40. Sager O, Beyzadeoglu M, Dincoglan F, Demiral S, Uysal B, et al. (2013) Management of vestibular schwannomas with linear accelerator-based stereotactic radiosurgery: a single center experience. Tumori 99(5): 617-622.

41. Dincoglan F, Beyzadeoglu M, Sager O, Uysal B, Demiral S, et al. (2013) Evaluation of linear accelerator-based stereotactic radiosurgery in the management of meningiomas: A single center experience. J BUON 18(3): 717-722.

42. Dincoglan F, Beyzadeoglu M, Sager O, Oysul K, Kahya YE, et al. (2013) Dosimetric evaluation of critical organs at risk in mastectomized left-sided breast cancer radiotherapy using breath-hold technique. Tumori 99(1): 76-82.

43. Demiral S, Beyzadeoglu M, Uysal B, Oysul K, Kahya YE, et al. (2013) Evaluation of stereotactic body radiotherapy (SBRT) boost in the management of endometrial cancer. Neoplasma 60(3): 322-327.

44. Sager O, Beyzadeoglu M, Dincoglan F, Oysul K, Kahya YE, et al. (2012) Evaluation of active breathing control-moderate deep inspiration breath-hold in definitive non-small cell lung cancer radiotherapy. Neoplasma 59(3): 333-340.

45. Sağer Ö, Dinçoğlan F, Gamsiz H, Demiral S, Uysal B, et al. (2012) Evaluation of the impact of integrated [18f]-fluoro-2-deoxy-D-glucose positron emission tomography/computed tomography imaging on staging and radiotherapy treatment volume definition of nonsmall cell lung cancer. Gulhane Med J 54: 220-227.

46. Sager O, Beyzadeoglu M, Dincoglan F, Oysul K, Kahya YE, et al. (2012) The Role of Active Breathing Control-Moderate Deep Inspiration Breath-Hold (ABC-mDIBH) Usage in non-Mastectomized Left-sided Breast Cancer Radiotherapy: A Dosimetric Evaluation UHOD - Uluslararasi Hematoloji-Onkoloji Dergisi 22(3): 147-155.

47. Dincoglan F, Sager O, Gamsiz H, Uysal B, Demiral S, et al. (2012) Stereotactic radiosurgery for intracranial tumors: A single center experience. Gulhane Med J 54: 190-198.

48. Dincoglan F, Beyzadeoglu M, Sager O, Oysul K, Sirin S et al. (2012) Image-guided positioning in intracranial non-invasive stereotactic radiosurgery for the treatment of brain metastasis. Tumori 98(5): 630-635.

49. Sirin S, Oysul K, Surenkok S, Sager O, Dincoglan F, et al. (2011) Linear accelerator-based stereotactic radiosurgery in recurrent glioblastoma: A single center experience. Vojnosanit Pregl 68(11): 961-966.

50. Demiral S, Sager O, Dincoglan F, Uysal B, Gamsiz H, et al. (2018) Evaluation of Target Volume Determination for Single Session Stereotactic Radiosurgery (SRS) of Brain Metastases. Canc Therapy & Oncol Int J 12(5): 555848.

51. Beyzadeoglu M, Sager O, Dincoglan F, Demiral S (2019) Evaluation of Target Definition for Stereotactic Reirradiation of Recurrent Glioblastoma. Arch Can Res 7(1): 3.

52. Sager O, Dincoglan F, Demiral S, Gamsiz H, Uysal B, et al. (2019) Evaluation of the Impact of Magnetic Resonance Imaging (MRI) on Gross Tumor Volume (GTV) Definition for Radiation Treatment Planning (RTP) of Inoperable High-Grade Gliomas (HGGs). Concepts in Magnetic Resonance Part A 2019.

53. Sager O, Dincoglan F, Demiral S, Gamsiz H, Uysal B, et al. (2019) Utility of Magnetic Resonance Imaging (Imaging) in Target Volume Definition for Radiosurgery of Acoustic Neuromas. Int J Cancer Clin Res 6: 119.

54. Demiral S, Sager O, Dincoglan F, Beyzadeoglu M (2019) Assessment of Computed Tomography (CT) And Magnetic Resonance Imaging (MRI) Based Radiosurgery Treatment Planning for Pituitary Adenomas. Canc Therapy & Oncol Int J 13(2): 555857.

55. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2019) Multimodality Imaging for Radiosurgical Management of Arteriovenous Malformations. Asian Journal of Pharmacy, Nursing and Medical Sciences 7(1): 7-12.

56. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2019) Evaluation of Radiosurgery Target Volume Determination for Meningiomas Based on Computed Tomography (CT) And Magnetic Resonance Imaging (MRI). Cancer Sci Res Open Access 5: 1-4.

57. Demiral S, Sager O, Dincoglan F, Beyzadeoglu M (2019) Assessment of target definition based on Multimodality imaging for radiosurgical Management of glomus jugulare tumors (GJTs). Canc Therapy & Oncol Int J 15: 555909.

58. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2019) Incorporation of Multimodality Imaging in Radiosurgery Planning for Craniopharyngiomas: An Original Article. SAJ Cancer Sci 6: 103.

59. Beyzadeoglu M, Dincoglan F, Demiral S, Sager O (2020) Target Volume Determination for Precise Radiation Therapy (RT) of Central Neurocytoma: An Original Article. International Journal of Research Studies in Medical and Health Sciences 5(3): 29-34.

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DOI: 10.19080/CTOIJ.2025.30.556280

60. Dincoglan F, Demiral S, Sager O, Beyzadeoglu M (2020) Utility of Multimodality Imaging Based Target Volume Definition for Radiosurgery of Trigeminal Neuralgia: An Original Article. Biomed J Sci & Tech Res 26(2): 19728-19732.

61. Demiral S, Beyzadeoglu M, Dincoglan F, Sager O (2020) Assessment of Target Volume Definition for Radiosurgery of Atypical Meningiomas with Multimodality Imaging. Journal of Hematology and Oncology Research 3(4): 14-21.

62. Dincoglan F, Beyzadeoglu M, Demiral S, Sager O (2020) Assessment of Treatment Volume Definition for Irradiation of Spinal Ependymomas: an Original Article. ARC Journal of Cancer Science 6(1): 1-6.

63. Sager O, Demiral S, Dincoglan F, Beyzadeoglu M (2020) Target Volume Definition for Stereotactic Radiosurgery (SRS) Of Cerebral Cavernous Malformations (CCMs). Canc Therapy & Oncol Int J 15(4): 555917.

64. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2020) Treatment Volume Determination for Irradiation of Recurrent Nasopharyngeal Carcinoma with Multimodality Imaging: An Original Article. ARC Journal of Cancer Science 6: 18-23.

65. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2020) Assessment of Target Volume Definition for Irradiation of Hemangiopericytomas: An Original Article. Canc Therapy & Oncol Int J 17(2): 555959.

66. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2020) Evaluation of Treatment Volume Determination for Irradiation of chordoma: an Original Article. International Journal of Research Studies in Medical and Health Sciences 5(10): 3-8.

67. Demiral S, Dincoglan F, Sager O, Beyzadeoglu M (2020) Multimodality Imaging Based Target Definition of Cervical Lymph Nodes in Precise Limited Field Radiation Therapy (Lfrt) for Nodular Lymphocyte Predominant Hodgkin Lymphoma (Nlphl). ARC Journal of Cancer Science 6(2): 06-11.

68. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2020) Radiosurgery Treatment Volume Determination for Brain Lymphomas with and without Incorporation of Multimodality Imaging. Journal of Medical Pharmaceutical and Allied Sciences 9: 2398-2404.

69. Beyzadeoglu M, Dincoglan F, Sager O, Demiral S (2020) Determination of Radiosurgery Treatment Volume for Intracranial Germ Cell Tumors (GCTS). Asian Journal of Pharmacy, Nursing and Medical Sciences 8(3): 18-23.

70. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2020) Target Definition of orbital Embryonal Rhabdomyosarcoma (Rms) by Multimodality Imaging: An Original Article. ARC Journal of Cancer Science 6(2): 12-17.

71. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2020) Evaluation of Target Volume Determination for Irradiation of Pilocytic Astrocytomas: An Original Article. ARC Journal of Cancer Science 6(1): 1-5.

72. Demiral S, Beyzadeoglu M, Dincoglan F, Sager O (2020) Evaluation of Radiosurgery Target Volume Definition for Tectal Gliomas with Incorporation of Magnetic Resonance Imaging (MRI): An Original Article. Biomedical Journal of Scientific & Technical Research (BJSTR) 27: 20543-20547.

73. Demiral S, Dincoglan F, Sager O, Beyzadeoglu M (2021) Assessment of Multimodality Imaging for Target Definition of Intracranial Chondrosarcomas. Canc Therapy Oncol Int J 18(2): 001-005.

74. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2021) Impact of Multimodality Imaging to Improve Radiation Therapy (RT) Target Volume Definition for Malignant Peripheral Nerve Sheath Tumor (MPNST). Biomed J Sci Tech Res 34(3): 26734-26738.

75. Sager O, Demiral S, Dincoglan F, Beyzadeoglu M (2021) Multimodality Imaging Based Treatment Volume Definition for Reirradiation of Recurrent Small Cell Lung Cancer (SCLC). Arch Can Res 9(1): 1-5.

76. Demiral S, Sager O, Dincoglan F, Beyzadeoglu M (2021) Radiation Therapy (RT) Target Volume Definition for Peripheral Primitive Neuroectodermal Tumor (PPNET) by Use of Multimodality Imaging: An Original Article. Biomed J Sci & Tech Res 34: 26970-26974.

77. Dincoglan F, Demiral S, Sager O, Beyzadeoglu M (2021) Evaluation of Target Definition for Management of Myxoid Liposarcoma (MLS) with Neoadjuvant Radiation Therapy (RT). Biomed J Sci Tech Res 33: 26171-26174.

78. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2021) Radiation Therapy (RT) target determination for irradiation of bone metastases with soft tissue component: Impact of multimodality imaging. J Surg Surgical Res 7(1): 042-046.

79. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2021) Evaluation of Changes in Tumor Volume Following Upfront Chemotherapy for Locally Advanced Non-Small Cell Lung Cancer (NSCLC). Glob J Cancer Ther 7(1): 031-034.

80. Sager O, Demiral S, Dincoglan F, Beyzadeoglu M (2021) Assessment of posterior fossa target definition by multimodality imaging for patients with medulloblastoma. J Surg Surgical Res 7(1): 037-041.

81. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2021) Assessment of the role of multimodality imaging for treatment volume definition of intracranial ependymal tumors: An original article. Glob J Cancer Ther 7: 043-045.

82. Beyzadeoglu M, Demiral S, Dincoglan F, Sager O (2022) Assessment of Target Definition for Extramedullary Soft Tissue Plasmacytoma: Use of Multımodalıty Imaging for Improved Targetıng Accuracy. Canc Therapy & Oncol Int J 22(4): 556095.

83. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2022) Target Volume Determination for Recurrent Uterine Carcinosarcoma: An Original Research Article Revisiting the Utility of Multimodality Imaging. Canc Therapy & Oncol Int J. 2022; 22(3): 556090.

84. Demiral S, Sager O, Dincoglan F, Beyzadeoglu M (2022) Reappraisal of Computed Tomography (CT) And Magnetic Resonance Imaging (MRI) Based Target Definition for Radiotherapeutic Management of Recurrent Anal Squamous Cell Carcinoma (ASCC): An Original Article. Canc Therapy & Oncol Int J 22(2): 556085.

85. Demiral S, Dincoglan F, Sager O, Beyzadeoglu M (2022) An Original Article for Assessment of Multimodality Imaging Based Precise Radiation Therapy (Rt) in the Management of Recurrent Pancreatic Cancers. Canc Therapy & Oncol Int J 22(1): 556078.

86. Sager O, Demiral S, Dincoglan F, Beyzadeoglu M (2022) Assessment of Target Volume Definition for Precise Radiotherapeutic Management of Locally Recurrent Biliary Tract Cancers: An Original Research Article. Biomed J Sci & Tech Res 46(1): 37054-37059.

87. Sager O, Demiral S, Dincoglan F, Beyzadeoglu M (2022) Radiation Therapy (RT) Target Volume Determination for Locally Advanced Pyriform Sinus Carcinoma: An Original Research Article Revisiting the Role of Multimodality Imaging. Biomed J Sci & Tech Res 45(1): 36155-36160.

88. Demiral S, Sager O, Dincoglan F, Beyzadeoglu M (2022) Improved Target Volume Definition for Radiotherapeutic Management of Parotid Gland Cancers by use of Multimodality Imaging: An Original Article. Canc Therapy & Oncol Int J 21(3): 556062.

89. Beyzadeoglu M, Sager O, Demiral S, Dincoglan F (2022) Reappraisal of multimodality imaging for improved Radiation Therapy (RT) target volume determination of recurrent Oral Squamous Cell Carcinoma (OSCC): An original article. J Surg Surgical Res 8: 004-008.

90. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2022) Multimodality imaging-based treatment volume definition for recurrent Rhabdomyosarcomas of the head and neck region: An original article. J Surg Surgical Res 8(2): 013-018.

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DOI: 10.19080/CTOIJ.2025.30.556280

91. Dincoglan F, Demiral S, Sager O, Beyzadeoglu M (2022) Appraisal of Target Definition for Management of Paraspinal Ewing Tumors with Modern Radiation Therapy (RT): An Original Article. Biomed J Sci & Tech Res 44(4): 35691-35696.

92. Beyzadeoglu M, Sager O, Demiral S, Dincoglan F (2022) Assessment of Target Volume Definition for Contemporary Radiotherapeutic Management of Retroperitoneal Sarcoma: An Original Article. Biomed J Sci & Tech Res 44(5): 35883-35887.

93. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2023) Appraisal of Target Definition for Anaplastic Thyroid Carcinoma (ATC): An Original Article Addressing the Utility of Multimodality Imaging. Canc Therapy & Oncol Int J 24(4): 556143.

94. Demiral S, Dincoglan F, Sager O, Beyzadeoglu M (2023) Reappraisal of Treatment Volume Determination for Parametrial Boosting in Patients with Locally Advanced Cervical Cancer. Canc Therapy & Oncol Int J 24(5): 556148.

95. Demiral S, Sager O, Dincoglan F, Beyzadeoglu M (2023) Tumor Size Changes after Neoadjuvant Systemic Therapy for Advanced Oropharyngeal Squamous Cell Carcinoma. Canc Therapy & Oncol Int J 24(5): 56147.

96. Demiral S, Dincoglan F, Sager O, Beyzadeoglu M (2023) Assessment of Changes in Tumor Volume Following Chemotherapy For Nodular Sclerosıng Hodgkin Lymphoma (NSHL). Canc Therapy & Oncol Int J 24(5): 556146.

97. Sager O, Demiral S, Dincoglan F, Beyzadeoglu M (2023) Evaluation of Volumetric Changes in Transglottic Laryngeal Cancers After Induction Chemotherapy. Biomed J Sci & Tech Res 51(4): 43026-43031.

98. Dincoglan F, Sager O, Demiral S, Beyzadeoglu M (2023) An Original Research Article for Evaluation of Changes in Tumor Size After Neoadjuvant Chemotherapy in Borderline Resectable Pancreatic Ductal Adenocarcinoma. Biomed J Sci & Tech Res 52(1): 43253-43255.

99. Sager O, Dincoglan F, Demiral S, Beyzadeoglu M (2023) Assessment of Tumor Size Changes After Neoadjuvant Chemotherapy in Locally Advanced Esophageal Cancer: An Original Article. Biomed J Sci & Tech Res 52(2): 43491-43493.

100. Beyzadeoglu M, Demiral S, Dincoglan F, Sager O (2023) Evaluation of Target Definition for Radiotherapeutic Management of Recurrent Merkel Cell Carcinoma (MCC). Canc Therapy & Oncol Int J 24(2): 556133.

101. Dincoglan F, Demiral S, Sager O, Beyzadeoglu M (2023) Reappraisal of Treatment Volume Determination for Recurrent Gastroesophageal Junction Carcinoma (GJC). Biomed J Sci & Tech Res 50 (5): 42061-42066.

102. Beyzadeoglu M, Dincoglan F, Demiral S, Sager O (2023) An Original Article Revisiting the Utility of Multimodality Imagıng for Refined Target Volume Determinatıon of Recurrent Kidney Carcinoma. Canc Therapy & Oncol Int J 23(5): 556122.

103. Beyzadeoglu M, Demiral S, Dincoglan F, Sager O (2023) Appraisal of Target Definition for Recurrent Cancers of the Supralottic Larynx. Biomed J Sci & Tech Res 50(5): 42131-42136.

104. Beyzadeoglu M, Demiral S, Dincoglan F, Sager O (2024) Reappraisal of Target Definition for Sacrococcygeal Chordoma: Comparative Assessment with Computed Tomography (CT) and Magnetic Resonance Imaging (MRI. Biomed J Sci & Tech Res 55 (1): 46686-46692.

105. Dincoglan F, Demiral S, Sager O, Beyzadeoglu M (2024) Assessment of Changes in Tumor Size After Induction Systemic Therapy for Locally Advanced Cervical Squamous Cell Carcinoma Running title: Tumor size changes in cervical carcinoma. Cancer Ther Oncol Int J 26(1): 001-007.

106. Dincoglan F, Beyzadeoglu M, Demiral S, Sager O (2024) Appraisal of Changes in Tumor Volume After Neoadjuvant Systemic Therapy for Hepatocellular Carcinoma (HCC). Cancer Ther Oncol Int J 26(2): 001-004.

107. Akin M (2022) Tobacco and lung cancer in elderly patients located in southern marmara: epidemiological study. Celal Bayar Universitesi Saglik Bilimleri Enstitusu Dergisi 9(2): 310-313.

108. Cinar D, Karadakovan A, Akin M (2022) Effects of Paper Marbling Art in the Cancer Rehabilitation Process: Descriptive Research. Journal of Traditional Medical Complementary Therapies 5(2): 132-142.

109. Akin M, Duzova M (2022) Evaluatin of Treatment Volume Determination for Anaplastic Oligodendrogliomas Based on Multimodality Imaging: An Original Article. Celal Bayar Universitesi Saglik Bilimleri Enstitusu Dergisi 9(3): 414-417.

110. Cinkaya A, Akin M, Sengul A (2016) Evaluation of treatment outcomes of triple negative breast cancer. Journal of Cancer Research and Therapeutics 12(1): 150-154.

111. Duzova M, Akin M (2022) Evaluation of survival outcomes and prognostic factors in acinic cell carcinomas of the parotid gland receiving adjuvant radiotherapy. Anatolian Current Medical Journal 4(3): 290-294.

112. Akin M, Duzova M (2022) Single fraction image guided radiation therapy for management of bone metastases during the COVID-19 pandemic. Journal of Health Sciences and Medicine 5(4): 961-965.

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