

# ONCOLOGY AND BIOMARKERS SUMMIT

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## Adaptive radiotherapy and its clinical application: An institutional experience

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**Introduction:** Radiotherapy is an integral part of cancer treatment and with the advent of newer technologies it has undergone a paradigm shift. The adaptive radiotherapy or more appropriately adaptive re-planning refers to any strategy that repeats the treatment planning process during treatment in response to anatomic changes in the target volume or the nearby critical structures.

**Materials & Methods:** Patients with proven evidence of malignancy were considered for radiotherapy with curative intent. The patients were simulated and planned with IMRT radiotherapy technique. After necessary quality assurance exercise they were approved for treatment. All patients were subjected to daily image guidance using CBCT and KV X-ray. During the process, if any patient was observed to have significant variation in planning target volume due to anatomical change, were re-planned. The cases where the use of adaptive radiotherapy has resulted in significant clinical outcome were isolated for presentation.

**Results:** The adaptive radiotherapy was most commonly used for Head and Neck cancer due to anatomical changes for weight loss or change in the size of the node. These patients were significantly benefited in terms of saving the normal structures being radiated due to the anatomical change. We observed few special cases like Adenoid Cystic Carcinoma (ACC) of bronchus with collapsed lung where the collapsed lung was inflated during treatment and resulted in

shifting of GTV medially and the adjacent critical structures. The patient was re-planned and was delivered curative dose of radiotherapy. It was observed that if such patients are not timely intervened the dose delivery to tumor would not be appropriate and the critical structures would get more dose of radiation. These patients were followed up and good clinical outcome was observed. The patient with ACC of bronchus had a disease-free interval of 38 months and she is surviving while writing this paper after 48 months with good quality of life.

**Conclusion:** The Adaptive re-planning or Adaptive Radiotherapy is a boon to the advancement of radiotherapy. This helps us to achieve better dose delivery to tumors and protection of adjacent normal structures. Though it has proven advantages in head and neck cancer, but it could also be very much useful in certain unusual cases like adenoid cystic carcinoma of bronchus. As per the literature, patients with ACC of bronchus treated with radiotherapy had a median survival of 23 months, where as our patient is surviving after 48 months while writing this paper.

### Speaker Biography

Suman Das is a consultant Radiation Oncologist in Queens NRI Hospital Visakhapatnam India. He was granted UICC fellowship at University of Michigan Ann Arbor USA. He has got many publications in various peer reviewed journals of Oncology. He has special interest in Head and Neck cancers.

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