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From Roentgen discovery to stereotactic radiosurgery

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Enormous, progress in technology and radiotherapy equipment from simple orthovoltage machines and single dose irradiation through linear accelerators, IMRT, IGRT, particle beams to stereotactic robotic radiosurgery is described and discussed. Also step-by-step progression from 1 H (Holtzknecht) to biologically equivalent doses (NBED) expressed in izobioGy2.0 in relation to dose fractionation modified from conventional to altered hyper-, accelerated and hypofractionation is exemplified by clinical results. Key role of overall treatment time and initial tumor volume seems to be - major factors determining treatment outcome in radiotherapy. Sequential combined therapy is confronted against teragnostic therapy showing therapeutic gain when combined therapeutic methods are individually designed. Importance of molecular margins and genetic and molecular profiling is discussed for selected solid malignant tumors. Significant gain in locoregional control due to combination of microvascular reconstructive surgery combined with postoperative IMRT is illustrated by clinical cases of H&N cancer. Impact of Diffusion Tensor Tractography MRI on efficacy of neurosurgery of glioblastomas is shown as example of stereotactic NeuroRadiosurgery System developed and working in the Gliwice Institute. Examples of clinical importance of molecular profiling of medullary thyroid cancer and breast, stomach and rectal cancers are presented. Significant technological and empirical improvement since Roentgen discovery about 120 years ago result in an increased efficacy of radiotherapy being on important part of individually designed combined treatment strategy.

Biography

Bogusław Maciejewski has completed his PhD and got scientific title of a Full Professor in Radiotherapy. He released research projects in the UCLA Los Angeles, Gray Lab London, MGH Harvard University, Boston, MDACC Houston and other cancer centers in Europe. He was the Director of Cancer Center–Institute Gliwice, Poland for 24 years, till 2015. He is author of over 200 papers published in reputed journals (IF=1650, citation index=3500). He was awarded G F Fletcher Gold Medal, Gold Medal of Life Achievements in Oncology given by all European Oncologic Societies as he is a honorary Member of American College of Radiology, Radiotherapy Expert of the IAEA in Vienna, and for 10 years, he was a member of European Board of Radiotherapy, participating in the development European curriculum for radiotherapy. His major scientific interest is importance of treatment time and tumor repopulation and altered dose fractionation in clinical radiotherapy for human tumors.

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