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Particle therapy: Past to future

Nuri Unal and **Nina Tuncel**
Akdeniz University, Turkey

Since the discovery of X-rays in 1895, radiation therapy has been prompted by continuous technological advances. Radiotherapy aims to achieve the optimal dose on the tumour volume while sparing normal tissues. The benefits can be entitled by patient cure, organ preservation and cost-efficiency. The efficacy of radiotherapy was demonstrated by many studies. The major importance for the treatment quality has been fostered during the past decade by linear accelerators produced X-rays, protons etc., with computer-assisted technology. More recently, these developments were augmented by proton and particle beam radiotherapy, usually combined with surgery and medical treatment in a multidisciplinary and personalized strategy against cancer. Current limiting factors of treatment with protons are the size, heavy weight and cost regarding conventional machines. New technological innovations are ongoing, such as those consisting of designing machines can be installed at a reasonable price in hospital based centres. Heavy particles as C-12 have the same treatment advantage as protons. The Bragg peak characteristics of them have made them attractive especially for radioresistant cancers. The main goal was to improve the ratio between an optimal dose in the tumour and the lowest dose possible in the organs at risk. This talk reviews the timeline of radiotherapy with a focus on breakthroughs in the physics of radiotherapy and technology during the past two decades. In conclusions, innovations in radiation therapy technology need continuous effort of research that would not be possible without the scientists, engineers, radiation oncologists and all the persons involved in the field of science and medical practice.

Biography

Nuri Unal has completed his PhD from Ankara University and Postdoctoral studies from Free University Department of Physics Berlin Germany. He is the Head of Physics Department in Science Faculty at Akdeniz University, Antalya, Turkey. He has published more than 40 papers in reputed journals and has been serving as an Editorial Board Member of repute.

nnuriunal@gmail.com

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