Contribution ID: **86** Type: **Proffered Papers**

NTCP and estimation of secondary cancer risk in Modulated Arc Therapy for prostate carcinoma using in-house software.

Wednesday, 17 February 2021 12:06 (6 minutes)

NTCP and estimation of secondary cancer risk in Modulated Arc Therapy for prostate carcinoma using in-house software.

1A.Boughalia, 2M.Fellah, 3 Ben Amirouche, 3A.Nekaa

1Medical Physics Department, Nuclear Research of Algiers, Algeria
a.boughalia@crna.dz
2Physics Faculty, Houari Boumedienne University Bab Ezzouar Algiers, Algeria
Fellahm1@yahoo.fr
3Radiotherapy Oncology Department, Fatima El Azhar Centre Dely Ibrahim, Algiers, Algeria
a.nekaa@cliniquealazhar.com
benamirouche@ cliniquealazhar.com

Introduction of the study
This study evaluates the toxicity for organs-at-risk and estimates the secondary cancer risk from Volumetric Modulated Arc Therapy for a cohort of prostate carcinoma patients using in-house software (Coupôle).

Methodology
A cohort of twelve patients was treated with 76 Gy using daily 2Gy fractions. The 18 MV (Elekta) treatment was planned using the Monaco TPS.
Normal tissue complication probability (Lyman-Kutcher-Burman) and secondary cancer probability (linear model rectum: $\alpha1=0.017$,$\alpha2=0.25$ and $(\alpha/\beta)=4.5$; bladder: $\alpha1=0.006$,$\alpha2=0.25$ and $(\alpha/\beta)=7.5$) were calculated for rectum and bladder using in-house software and the NTCP values were compared to those obtained with Biosuite.

Results
The mean NTCP for rectal bleeding (grade≥2) was 7.14% (range 4.38-9.72%) obtained with Coupôle versus 7.50% (range 4.2-10.1%) with Biosuite and for fecal incontinence we have obtained 5.43 % (range 3.7-7.3) versus 5.33% (range 3.66-7.15) respectively. The estimated risk for secondary cancer is 1.30% for rectum and it was 0. 73% for bladder. Regarding the risk for secondary malignancies, the VMAT plans showed the highest values for both rectum and bladder for certain patients of studied cohort.

Conclusion
Our in-house software Côupole was valdated against Biosuite; twelve prostate treatment plans were evaluated in terms of toxicity and second cancer risk. Evaluation of NTCP and second cancer estimates can improve treatment quality, particulary when complex treatment modalities are involved.

Keys words: NTCP, secondary cancer risk, rectum, bladder, VMAT, prostate carcinoma.

Country or Int. Organization

Algiers

Affiliation

Medical Physics Department Nuclear Resear of Algiers Algeria

Primary author: BOUGHALIA, Assya (Medical Physics Department, Nucleaire Research of Algiers)

Co-authors: Prof. FELLAH, Mohamed (Physics Faculty, USTHB Algiers); Dr BEN AMIROUCHE (Radiotherapy Oncology Departement Fatima El Azhar Centre); Mrs NEKAA, Amel (3Radiotherapy Oncology Department, Fatima El Azhar Centre Dely Ibrahim, Algiers)

Presenter: BOUGHALIA, Assya (Medical Physics Department, Nucleaire Research of Algiers)

Session Classification: Paper Session 4: Radiobiology