



Contribution ID: 318

Type: Poster

Multileaf collimator testing – a nationwide audit in Poland

Thursday, June 22, 2017 10:55 AM (5 minutes)

Introduction: The delivery of accurate intensity-modulated radiation therapy (IMRT) or stereotactic radiotherapy depends on a multitude of steps in the treatment delivery process. The proper intensity modulation depends on the proper functioning of a multileaf collimators (MLC). The aim of this audit was the control of the proper collimator leaves positioning.

Methods: The methodology of the audit of small field output performance was established within the framework of the CRP E2.40.16 project “Development of Quality Audits for Radiotherapy Dosimetry for Complex Treatment Techniques”, run by the Health Section of the International Atomic Energy Agency (IAEA). The participants of the audit were obliged to irradiate provided dosimetric films, in a slab phantom, for a specific leaf arrangement, producing a pattern of five stripes, commonly called a picket fence. The participants had to programme such a pattern so that the stripes are 5 mm wide and are 3 cm distant between themselves. The Gafchromic EBT2 radiochromic films were placed in a slab phantom close to maximum dose depth. The irradiation was 250 MU per stripe.

Results: Thirty two Polish radiotherapy centres took part in the audit. They were equipped with various accelerator types and various treatment planning systems. In all cases the 6 MV quality beams were used. The discrepancies between measured and expected stripe positions were in the range 1.2 mm. For particular participants, the leaf opening positioning bias were in the range -0,5 mm to 0,5 mm. For particular participants, the mean opening width measured with films for each pair of leaves was between 6 and 8 mm.

Conclusion: In the audit, the best performance showed the new type multileaf collimators with 120-160 leaves, The worst performance showed collimators MLC80 from Elekta. The results of the audit are very useful for the participants who should carefully investigate the performance of their multileaf collimators.

Country

Poland

Institution

The Maria Sklodowska-Curie Memorial Cancer Centre

Primary author: CHELMINSKI, Krzysztof (The Maria Sklodowska-Curie Memorial Cancer Center, Medical Physics Department)

Co-author: BULSKI, Wojciech (The Maria Sklodowska-Curie Memorial Cancer Center, Medical Physics Department)

Presenter: CHELMINSKI, Krzysztof (The Maria Sklodowska-Curie Memorial Cancer Center, Medical Physics Department)

Session Classification: Thursday morning - Poster Presentations - Screen3

Track Classification: QA/QC