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Measurement of testicular dose during the treatment of Ewing Sarcoma patient underwent External Beam Radiotherapy

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Purpose

The present investigation aimed to measure testicular dose during the treatment of Ewing Sarcoma patient underwent external beam radiotherapy.

Materials and methods

A right sided pelvis Ewing Sarcoma patient aged 17 years with pubertal status was chosen for the study. The patient was planned to treat with external beam radiotherapy with radiation dose prescription of a total of 60 Gy/30#. The treatment plan of patient was planned on TiGRT treatment planning system (LinaTech). The patient was treated with 3DCRT on Siemens Oncor Expression machine. The thermoluminescence dosimeter system used in the study is a commercial TL reader system with CaSO₄: Dy discs, manufactured by Nucleonix, India. Thermoluminescence dosimeters were used to measure the testicular dose during the external beam radiotherapy treatment.

Results

The TPS calculated testicular volume of right and left testicle was found to be 20.01 and 12.20 cc respectively. The TPS calculated doses for right and left testicle were found to be 1.40 cGy and 0.80 cGy respectively. The measurements were made for right and left testicle dose and observed doses were found to be 1.31±0.03 cGy and 1.03±0.12 cGy respectively. The cumulative dose to testes in whole treatment was estimated to 35.03 cGy. The percentage deviation between TPS calculated dose and TLD measured dose were observed 7% and 20% for right and left testes respectively.

Conclusion

TLD has been proven to be a promising dosimeter for in vivo dosimetry. The cumulative dose to testes in whole EBRT treatment was found lesser than the ICRP recommended threshold absorbed dose for occurrence of deterministic effect of radiation. Our results of dose to right gonad showed that the measurement of dose at the surface of testicular is sufficient to evaluate the dose to testicle during radiotherapy. However, TLD calculated dose for left gonad indicating the non reliability of TPS calculated dose for distant OARs from the radiation field.

Institution

SMS Medical College & Hospital, Jaipur

Country

India

Author: JAIN, Gourav Kumar (Department of Radiological Physics, SMS Medical College & Hospital, Jaipur)

Co-authors: CHOUGULE, Arun (Department of Radiological Physics, SMS Medical College & Hospital, Jaipur); MAN-GAL, Dinesh (SEAROC Cancer Centre, Jaipur)

Presenter: JAIN, Gourav Kumar (Department of Radiological Physics, SMS Medical College & Hospital, Jaipur)

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