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

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Introduction

• Pelvic sarcomas are rare and malignant. Therefore, there is no consensus on risk factors for radiotherapy.

Patient characteristics

• A 17 years old male patient with pubertal status diagnosed right sided pelvis Ewing Sarcoma in pubic bone.

Aim and objective

• The aim of present prospective analysis is to evaluate and report the testicular dose during pelvic sarcoma radiotherapy.
Materials & methods

- The patient treated with 5-field step and shoot IMRT plan for 6 MV X-ray photon energy beam on Siemens Oncor Expression with total radiation dose prescription of 60 Gy/30 #.
- The testes doses were measured using CaSO4: Dy thermoluminescence dosimeter (TLD) measuring 1.3 mm diameter & 0.8 mm thickness.
- TLD placed over surface of testes and doses were evaluated for 3 fractions.
Results

• The TPS calculated testicular volume of right and left testicle was found to be 20.01 and 12.20 cc respectively.
• The right and left observed doses were found to be 1.31±0.03 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 TLD measured and TPS calculated dose were observed +7% and +20% for right and left testes respectively.
Conclusions

- The measurement of dose at the surface of testicular is sufficient to evaluate the dose to testicle during radiotherapy.
- Large deviation observed in TPS measured dose for left gonad indicating the non-reliability of TPS calculated dose for distant OAR from radiation field edge.
- 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. However, the chances of stochastic effect cannot be overruled.
- Sperm count/testosterone hormone level analysis at follow up with delivered dose is a good method of evaluation.