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abstract

Evaluating Ovarian Dose Following Ovarian Transposition in Female Pelvic Sarcoma Patients Undergoing Radiation Therapy

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Evaluating Ovarian Dose Following Ovarian Transposition in Female Pelvic Sarcoma Patients Undergoing Radiation Therapy

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Introduction: Human oocytes are highly radio-sensitive, with even low radiation therapy (RT) doses increasing the risk of premature ovarian failure (POF). Higher RT doses, younger age, and alkylating agents further elevate the risk of acute ovarian failure (AOF) and primary ovarian insufficiency (POI). Ovarian transposition (OT) is an important fertility preservation strategy, yet scattered radiation dose to ovaries remains a concern, necessitating optimized RT planning. This study aims to assess the impact of OT on radiation dose reduction and correlate ovarian doses with anatomical positioning relative to the iliac crest.

Methodology: A retrospective analysis (February 2009-January 2025) identified 19 female pelvic sarcoma patients. Data on demographics, tumor characteristics, RT details, OT status, and ovary-iliac crest distance were recorded.

Results: The median age of patients was 6 years (SD=5). The majority had Rhabdomyosarcoma (n=12,63%), followed by Ewing sarcoma (n=5,26%), Neuroblastoma (n=1,5%), and Osteosarcoma (n=1,5%). RT techniques were 3D-Conformal RT (3DCRT) (n=3, 16%), Intensity Modulated Radiation therapy (IMRT) (n=8,42%), and Volumetric Modulated Arc Therapy (VMAT) (n=8,42%). The median total dose was 5040 cGy (SD=517). OT was performed in 6 (32%) patients. Transposed ovaries were positioned at a median of 1.5 cm superior or 0.35 cm inferior to the iliac crest. The mean dose to the right ovary in transposed patients was 431.25 cGy (SD= 1879.06), while 122.4 cGy (SD= 319.19) to the left.

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Due to the small sample size, a definitive correlation between ovarian dose and distance from the iliac crest could not be established.

Conclusion: Despite ovarian transposition, scatter radiation remains a concern, and precise surgical positioning is crucial to minimize dose exposure. Standardized RT planning and strict ovarian dose constraints are essential to optimize fertility preservation in female pelvic malignancy patients.