Postoperative intensity-modulated radiation therapy for sinus cancers

Record Status
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Citation

Authors' conclusions
Sinonasal cancer includes cancer of the nasal cavity or any of the paranasal sinuses. This cancer is rare, accounting for <1% of all malignancies, and typically presents at an advanced stage of disease. Standard treatments for sinonasal cancer include surgery, radiation therapy (RT), and chemotherapy. Postoperative RT improves local control but is associated with serious complications due to the proximity of critical structures, or organs at risk (OARs), such as the central nervous system. RT is performed via a linear accelerator (LINAC), which generates radiation beams, and a collimator, which sizes and shapes the beams. In conventional RT, the collimator shapes the beams to irradiate a rectangular target area, and blocks attached to the LINAC beyond the collimator shield segments in the target area from irradiation. But since the beams do not precisely match the irregular shape of targeted tumors, normal tissue and OARs are susceptible to radiation damage. The use of multileaf collimators (MLCs) theoretically reduces the probability of such damage. An MLC consists of 20 to 80 small leaves, each of which can move independently to block a small portion of the radiation beam, thereby sculpting it to fit the geometric shape of the target volume. Computer software positions the leaves according to the treatment plan, which permits more precise radiation targeting compared with conventional collimation. MLCs are used for three-dimensional conformal RT (3D CRT) and intensity-modulated RT (IMRT). In IMRT, the leaves are opened and closed to reduce the radiation dose in given areas of the target volume to slice the beam into smaller beams. While 3D CRT represents an improvement over conventional RT, IMRT represents an improvement over 3D CRT since it also delivers different doses of radiation to different areas of the target volume.

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