Stereotactic Radiosurgery for Resected Brain Metastases: New Evidence Supports a Practice Shift, but Questions Remain

Minniti et al

In this month’s Oncology Scan, our CNS editorial team looks at recent studies defining the management of brain metastases. Should there be post-operative stereotactic radiosurgery or observation? What about post-operative SRS or whole brain radiation? And can pre-operative SRS reduce the rate of leptomeningeal spread at resection? The paradigm is changing, but a lot of questions still remain.

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Dose Escalation Using Contact X-ray Brachytherapy After External Beam Radiotherapy as Nonsurgical Treatment Option for Rectal Cancer

Sun Myint et al and Habr-Gama

Myint and colleagues reviewed the outcomes of patients with cT2 and cT3 rectal cancer who had residual disease <3 cm after chemo-radiation, and were not subsequently managed surgically. Instead they received 90 Gy in 3 fractions directly onto the tumor with 50kVp contact therapy. They report on 83 patients with a median follow up of 2.5 years. Clinical CR was achieved in 64% of patients after the boost. Thirteen percent of these subsequently relapsed. The authors suggest that a contact therapy boost may be given to selected patients with suspicious residual disease (<3 cm) following EBCRT/EBRT as an alternative to radical surgery. These would be elderly or comorbid patients who are unsuitable for surgery, or those who passionately wish to avoid surgery. A separate commentary on this subject is written by Habr-Gama.

Pages 565 and 574

Refining Patient Selection for Reirradiation of Head and Neck Squamous Carcinoma in the IMRT Era: A Multi-institution Cohort Study by the MIRI Collaborative

Ward et al

This multi-institutional study included 412 patients reirradiated with VMAT or IMRT for head and neck squamous cancer. The median dose delivered was 60 Gy and the median time between RT courses was 2.4 years. Chemotherapy was used in 76%. The rates of grade ≥3, grade ≥4 and grade 5 acute toxicities were 19%, 4% and 1% respectively. RPA identified 3 prognostic subgroups with distinct survival—class 1 included those >2 years from their initial course of RT with resected tumors (2-Year OS 62%); class 2 included those >2 years with unresected tumors or those ≤2 years and without feeding tube or tracheostomy dependence (2-Year OS 40%), and the remainder formed class 3 (2-Year OS 17%).

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A Multi-institutional Comparison of SBRT and IMRT for Definitive Reirradiation of Recurrent or Second Primary Head and Neck Cancer

Vargo et al

These authors compared the 2 modern methods of reirradiation, IMRT and SBRT, for patients with unresected recurrent or second-primary squamous carcinoma of the head and neck using a retrospectively gathered multi-institution database. More than 400 patients were included, approximately half treated by each technique. Unadjusted 2-year overall survival (OS) was 35% for IMRT and 16% for SBRT. No significant differences in OS or LRF were seen between treatments for those with class 3 tumors, for whom survival was very poor. The advantage to IMRT was seen primarily in class 2 (>2 years inter-treatment interval) although the gap narrowed when tumor size was taken into account. Acute grade ≥4 toxicity was greater in the IMRT compared to the SBRT group (5.1% vs. 0.5%), with no significant difference in late toxicity.

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Volume, Dose, and Fractionation Considerations for IMRT-based Reirradiation in Head and Neck Cancer

Caudell et al and Margalit and Wong

The impact of elective nodal treatment, dose, and fractionation on overall survival (OS), locoregional control (LRC), acute and late toxicity were assessed in a database of patients reirradiated for recurrent head and neck squamous cancer. Elective nodal radiation therapy did not appear to decrease the risk of LRF or improve survival, nor did hyper-fractionation. Doses $>66$ Gy were associated with improvements in LRF and OS in the definitive setting but not in the post-operative setting. The rate of acute grade $\geq 3$ toxicity was 22% overall, worst among those receiving elective neck radiation. The rate of overall late grade $\geq 3$ toxicity was 17%, with patients treated postoperatively with hyper-fractionation experiencing the highest rates. This paper, and those by Ward and Vargo, are discussed together in an editorial by Margalit.

Pages 606 and 618

Secondary Acute Leukemia in Sarcoma Patients: A Population-Based Study

Sanford et al

These authors used the SEER database to assess the rate of acute leukemia among patients with a primary diagnosis of connective tissue malignancy treated between 1973 and 2008. Nearly 73,000 patients were identified with a median follow-up of 131 months. On multivariable competing-risk analysis, factors associated with increased risk of secondary acute leukemia included receipt of radiation therapy (HR 1.7), distant disease (HR 2.7), male gender (HR 1.5), and Ewing (HR 9.9) and osteosarcoma histology (HR 5.1). The 10-year cumulative incidence of secondary acute leukemia for patients who did and did not receive radiation therapy was 0.3% vs. 0.1% ($P = .02$).

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Optimal High-Dose-Rate Brachytherapy Fractionation Scheme After Keloid Excision

Bijlard et al

Excision followed by brachytherapy is considered an effective treatment for keloids, however, the optimal brachytherapy dose and fractionation scheme is unknown. Patient cohorts from 3 centers treated with keloid excision followed by either $2\times9$ Gy, $3\times6$ Gy, or $2\times6$ Gy HDR brachytherapy were retrospectively compared. A total of 238 keloids were treated and an overall recurrence rate of 8% seen. After correction for confounders no statistically significant differences in recurrence rates could be discerned between fractionation schemes. Lower radiation dose resulted in significantly fewer complications. The authors recommend a biological equivalent dose around 20 Gy based on both low recurrence and complication rates.

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A Phase 2 Trial of Samarium-153 Followed by Salvage Prostatic Fossa Irradiation in High-Risk Clinically Nonmetastatic Prostate Cancer After Radical Prostatectomy

Valicenti et al

This single arm phase 2 trial was performed by the RTOG to assess the utility of Samarium-153 in men with prostate cancer status post radical prostatectomy, who develop biochemical failure with no clinical evidence of osseous metastases. All patients received Samarium-153 followed by salvage external beam radiation therapy to the prostatic fossa. No ADT was allowed. A total of 60 enrolled eligible patients were included with a median follow up of 4 years. The 12-week PSA response was achieved in only 7/52 (14%) evaluable patients compared to the 25% hypothesized. The 2-year FFP was 26%, and biochemical failure rate was 64%. Sixteen of 60 had Grade 3-4 hematologic AEs but no Grade 5 hematologic AEs were seen. This trial did not meet its primary endpoint of PSA response, and although the regimen of Samarium-153 and salvage EBRT was well tolerated, contemporary forms of androgen deprivation have now superseded it.

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Radiation Safety for Pregnant Workers at a Proton Facility

Maquilan et al

Special considerations for radiation safety are necessary with proton therapy, such as dose from equipment activated by the proton beam. Standard national guidelines for pregnant proton therapy radiation workers have not been established. Over the 14-week period of this study, the mean background corrected dose for both the passively scattered proton radiation therapy technologists (RTTs) and the photon RTTs was the same at 39.9 mrem. Exposure rates were lower in equipment activated in a scanning beam system in comparison to those from a passive scatter system. Based on these data, this department’s policy permits pregnant radiation workers to work in proton treatment areas, and the policy for pregnant workers does not differ between proton and photon radiation workers, or between passive scatter and scanning beam systems.

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