

# Anaplastic Lymphoma Kinase (ALK) Brain Radiation Therapy

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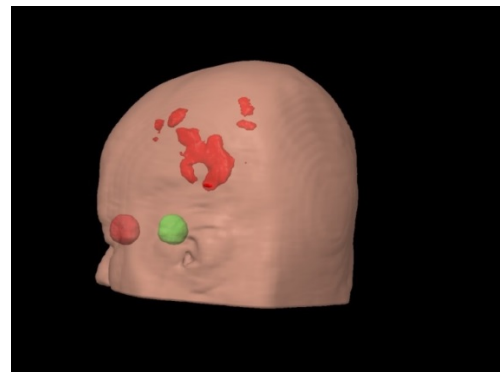
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## Clinical Image

We present a case of a 44 year-old male patient diagnosed with stage IV right lung adenocarcinoma, Anaplastic Lymphoma Kinase (ALK) mutation positive, metastatic to bone and brain. He was started on Crizotinib and referred for brain radiation therapy. He had multiple small brain metastatic lesions, all smaller than 2 cm, treated with Linear accelerator (LINAC) based stereotactic radiation therapy (SRS), 20 Gy in one session. He tolerated treatment well with no major complications. Around a month post treatment, he had patches of alopecia as shown in the Figure 1 that correlated with the 3 Gy isodose line.

Alopecia is a common side effect of anti-cancer therapy. Chemotherapy which targets the proliferating cells represent the most common cause of alopecia, however, radiation-induced alopecia (RIA) has been well described in the literature, mainly in patients who receive brain radiotherapy (Figure 2). While RIA is common in patients who receive whole brain radiation therapy (WBRT), it is less frequently seen or reported in patients who receive SRS. RIA is a dose-dependent process, which can be permanent or temporary. Hair follicles targeted during treatment are highly vulnerable and can be affected at low doses of 0.75-2 Gy.

It is believed that 7 Gy in a single session and 43 Gy in standard fractionation can result in permanent alopecia. Microscopic changes are usually seen within 2 days of irradiation and hair loss occurs when the matrix cells are depleted. Regrowth may occur if few matrix cells survive and this may take up to 2-4 months after treatment completion. Few if any pharmacological interventions have succeeded in the treatment of RIA and several clinical trials are on-going. Our patient had regrowth of his hair three months following the end of treatment.



**Figure 1:** Multiple small brain metastatic lesions smaller than 2 cm. Treated with Linear accelerator (LINAC) based stereotactic radiation therapy (SRS).



**Figure 2:** Post Treatment, patches of radiation-induced alopecia.