The Role of Biological MR Imaging in the Treatment of Head & Neck Cancer
Suresh K. Mukherji MD, FACR
University of Michigan Health System

Learning objectives:
1. Review the Current Applications of MR Diffusion in evaluating Head and Neck Squamous Cell Carcinoma (HNSCCA)
2. Review the Current Applications of evolving techniques of MR diffusion in evaluating Squamous Cell Carcinoma (HNSCCA)
3. Present early results of MR perfusion in predicting response in HNSCCA

MR diffusion and perfusion are commonly used to detect inftracts in patients presenting with acute neurological changes. More recently, the alterations in molecular motion have been used to predict response in patients with intracranial and head and neck tumors. The intent of this presentation will review the current applications of DWI and MR perfusion in the treatment of squamous cell carcinoma of the head and neck. Early results have suggested that DWI performed at 3T can help differentiate benign versus malignant lesions of the head and neck and help distinguish between recurrent tumor and post-treatment changes. In addition new techniques such as Parametric Response Maps and histogram analysis have shown promise in detecting early molecular changes that can predict early response and survival.

Malignant Tumor

Benign Tumor
References

III. MR Perfusion
MR perfusion non-invasively measure the microvascular environment of tissue. Recent investigations suggest that dynamic contrast enhanced MR suggest that an elevation in BV during treatment is suggestive of local control. These findings were more predictive that changes in tumor volume. These findings suggest that an increase in local blood supply, potentially as a source of increased oxygenation, may be a positive indicator for therapeutic response at the primary tumor site.

Non Responder - 18% Decrease

Pre RT 2 weeks of RT

![Tumor](image)

Responder – 90% Increase

![Tumor](image)

References: