EDUCATIONAL OBJECTIVES

- To demonstrate the typical conventional imaging features of metastases versus glioma
- To demonstrate the impact of scan parameters, sequences (SE vs GRE) and contrast agents in the detection of metastases
- To illustrate some of the advanced imaging findings which can differentiate metastases from glioma
- To illustrate a multi-parametric, algorithmic approach towards cancer imaging using diffusion, perfusion, spectroscopy and other tools

PRESENTATION SUMMARY:

The differentiation between metastatic disease (particularly a solitary metastasis) and primary glioma is sometime a clinical challenge. But this has an important impact on the further staging, work up, triaging of therapy, follow up and prognosis of these patients. There are a number of conventional imaging findings of metastases versus primary gliomas which tend to be infiltrating tumors along various white matter tracts such as the corpus callosum.

The detection of contrast enhancement in metastases and gliomas is also dependent of a number of technical factors such as slice thickness, the type of sequences utilized (spin echo vs gradient echo T1-weighted imaging), the dose and potential type of contrast agent.

The inherent pathophysiologic differences in the peritumoral region surrounding metastases vs gliomas can be exploited to differentiate the 2 pathologies. Metastases are well circumscribed lesions where the surrounding T2 signal abnormality is purely vasogenic edema, whereas in primary gliomas, the surrounding T2 signal abnormality consists of a combination of vasogenic edema and infiltrating glioma. This will result in differences in rCBV, Cho and ADC in the surrounding T2 signal on perfusion, spectroscopy and diffusion respectively.
Finally as there are multiple parameters from advanced imaging techniques available to us, we can combine these tools in an algorithmic fashion to increase our diagnostic sensitivity and specificity.

REFERENCES:


