Al-Mustaqbal University
College of Health and Medical Technologies
Radiological Techniques Department

Magnetic Resonance Imaging

First Semester

Lecture 30 : MRI of soft tissue tumors

By

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Introduction :

MRI is a valuable imaging modality for the evaluation of soft tissue tumors. It provides detailed **anatomical and functional information about the tumor**, helping with **diagnosis, characterization, and treatment planning.**

Scientific Content:

-Soft tissue masses or lesions are a common medical condition seen by primary care physicians, family physicians, surgeons and orthopedists. They include all outgrowths, both benign and malignant, arising from soft tissue.

-MRI is considered the imaging modality of choice for the evaluation and tissue characterization "distinguishing between benign and malignant tumors, and identifying specific tumor types." **of soft tissue masses.**

1- It can aid in the differentiation of **watery, fatty and solid tumor** components and with
2- the **administration of contrast in the differentiation of cystic lesions and myxoid neoplasms** .
3- It helps in the **localization of tumors within the different anatomic compartments** and the determination of their

relationship to neurovascular structures and the muscular fascia and

4- can be used to guide biopsy.

-MRI Sequences in soft tissue tumor:

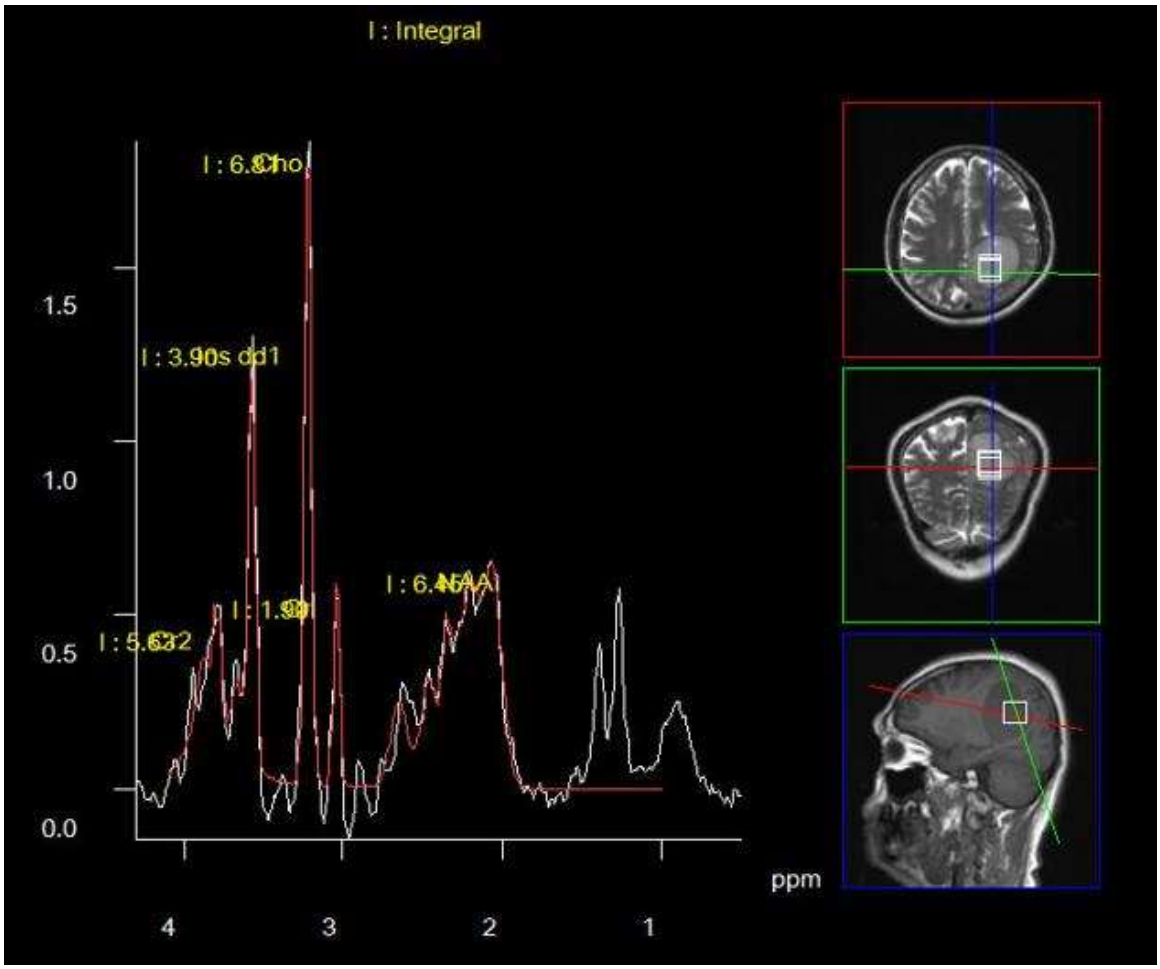
T1WI	**Provides anatomical details and helps assess tumor's location and relationship to nearby structure.**
T2WI	**Highlights differences in tissue water content and is valuable for characterizing soft tissue tumors and tumor's extent.**
Fat suppression	**Suppresses the signal from fat, enhancing the visibility of lesions esp. when tumor involve the skull base.**
Delayed contrast MRI	**Highlighting the tumor and assess its vascularity.**
DWI	**Measures the diffusion of water molecules in tissues, which can aid in differentiating between benign and malignant tumor.**
Post-con (T1)	**Highlight the enhancement pattern of the tumor and its relationship to nearby structures.**

FLAIR	**It is necessary to assess the white matter tumor involvement and related vasogenic edema.**
SWI	**Identify blood products or classifications within the tumor.**
Perfusion	**Elevation of CBV is generally related with a high-grade tumor.**
MRS	**Metabolic peaks characterization**

Perfusion = BV (blood volume), BF (blood flow), MTT (mean transit time) and TTP (time to peak)

Key Metabolites

1. **N-Acetylaspartate (NAA)**:
   - Marker of neuronal health.
   - Typically found at around 2.0 ppm.
2. **Choline (Cho)**:
   - Associated with cell membrane turnover.
   - Peaks at approximately 3.2 ppm.
3. **Creatine (Cr)**:
   - Indicator of energy metabolism.
   - Peaks at around 3.0 ppm.
4. **Lactate**:
   - A marker of anaerobic metabolism.
   - Appears at 1.3 ppm.


I : Integral
I : 6.8Cho
1.5
I : 3.90s dd1
1.0
I : 6.4NAA
I : 1.9
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4
3
2
1