3rd Meeting of the International Consensus Meeting
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T7 Are there specific imaging features which can prognosticate treatment outcomes?

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Why is this topic Important

Early Risk Stratification:
Identifying prognostic imaging features (e.g., degree of vertebral destruction, abscess formation, spinal cord compression) helps clinicians classify patients into high- or low-risk categories early in the disease course.

Treatment Planning:
Imaging-based prognosis can influence decisions on medical vs. surgical management, duration of therapy, and the need for closer monitoring or early intervention.

Why is this topic Important

Predicting Complications:
Certain imaging signs may correlate with a higher risk of deformity progression, neurologic deficits, or treatment failure, prompting preemptive action.

Patient Counseling:
Prognostic information helps in setting realistic expectations regarding recovery, disability, and potential need for surgery or rehabilitation.

Why is this topic Important

Standardizing Care:
Establishing consistent imaging markers can contribute to more uniform clinical decision-making and guide future treatment algorithms.

Research and Outcome Studies:
Linking imaging features with outcomes allows for better evaluation of new treatments, surgical techniques, and long-term care strategies.

Literature Review/Process

- Number of articles retrieved: 320
- Screening: 15
- Final number of publications: 7

Findings from Literature

Significant vertebral collapse (indexed total bone height loss >0.3) in an initial X-ray was predictive of severe kyphotic deformity of thoracic spine.(1)

Computed tomography (CT) and radiographic features are valuable for evaluating bony architecture and kyphosis prediction. Specific features include Bone Height Loss and Kyphosis. Thoracolumbar involvement poses higher risks of progressive deformity.(1)

The presence of calcification and sclerosis in lesions suggests the presence of a chronic disease and may indicate treatment resistance.(2)

1. Jutte P, Wuite S, The B, Van Altena R, Veldhuizen A. Prediction of Deformity in Spinal Tuberculosis: Clinical Orthopaedics and Related Research. Februar 2007;455:196–201.
2. Singh R, Magu NK, Rohilla RK. Clinicoradiologic Profile of Involvement and Healing in Tuberculosis of the Spine. Ann Med Health Sci Res. 2016;6(5):311–27.

Findings from Literature

Key prognostic imaging features are the presence of Bone Marrow Edema and Endplate Erosions in MRI. These are early signs of vertebral involvement on MRI, with their resolution over time suggesting healing. Persistent edema may correlate with poor outcomes.(2,3)

Large abscesses with significant spinal cord compression are associated with delayed neurological recovery.(4,5)

2. Singh R, Magu NK, Rohilla RK. Clinicoradiologic Profile of Involvement and Healing in Tuberculosis of the Spine. Ann Med Health Sci Res. 2016;6(5):311–27.
3. Misra UK, Warrier S, Kalita J, Kumar S. MRI findings in Pott's spine and correlating clinical progress with radiological findings. Neuroradiology. Juli 2020;62(7):825–32.
4. Gupta AK, Kumar C, Kumar P, Verma AK, Nath R, Kulkarni CD. Correlation between neurological recovery and magnetic resonance imaging in Pott's paraplegia. IJOO. August 2014;48(4):366–73.
5. Jain AK, Jena A, Dhammi IK. Correlation of clinical course with magnetic resonance imaging in tuberculous myelopathy. Neurol India. Juni 2000;48(2):132–9.

Findings from Literature

Decreasing paraspinal soft tissue inflammation during treatment is a positive indicator of response to the therapy.(2,3)

Imaging evidence of stable vertebral bony structures is crucial for good outcomes, while instability necessitates surgical intervention.(3,6)

2. Singh R, Magu NK, Rohilla RK. Clinicoradiologic Profile of Involvement and Healing in Tuberculosis of the Spine. Ann Med Health Sci Res. 2016;6(5):311–27.
3. Misra UK, Warrier S, Kalita J, Kumar S. MRI findings in Pott's spine and correlating clinical progress with radiological findings. Neuroradiology. Juli 2020;62(7):825–32.
6. Joo EJ, Yeom JS, Ha YE, Park SY, Lee CS, Kim ES, u. a. Diagnostic yield of computed tomography-guided bone biopsy and clinical outcomes of tuberculous and pyogenic spondylitis. Korean J Intern Med. 1. Juli 2016;31(4):762–71.

Findings from Literature

The resolution of gadolinium-enhancing lesions, reduction in soft tissue mass, and decreased marrow edema on serial MRIs are reliable markers of therapeutic success.(2,7)

Severe or progressive kyphosis on imaging mandates surgical correction to prevent long-term disability.(1) The extent of kyphosis can usually only be determined on a standing X-ray or an upright CT or MRI.

1. Jutte P, Wuite S, The B, Van Altena R, Veldhuizen A. Prediction of Deformity in Spinal Tuberculosis: Clinical Orthopaedics and Related Research. Februar 2007;455:196–201.
2. Singh R, Magu NK, Rohilla RK. Clinicoradiologic Profile of Involvement and Healing in Tuberculosis of the Spine. Ann Med Health Sci Res. 2016;6(5):311–27.
7. Gupta A, Paliwal VK, Bharatveer S, Mishra P, Jain N. Clinical and Radiological End Points to Stop Anti-Tubercular Treatment in Central Nervous System Tuberculoma and Predictors of Poor Outcome: A Retrospective Study. The American Journal of Tropical Medicine and Hygiene. 1. November 2023;109(5):1141–7.

Question:

- Are there specific imaging features which can prognosticate treatment outcomes in tuberculosis?

❖Response:

- **Yes, there are radiological features to prognosticate treatment outcomes.**

(The main clinical outcomes in spinal tuberculosis are healing of disease, severity of deformity and neurological deficit. Early resolution of abscess and bone marrow edema are usually associated with good clinical recovery. For neurological deficit, the presence of myelomalacia indicates poorer prognosis. Radiological features of instability or a deformity > 40 degrees are associated with poorer outcomes and may indicate the need for surgical intervention.)

❖Vote:

Agree – 92.9%, Disagree – 1.8%, Abstain – 5.4%
(Unanimous Consensus)