

## 3D Coherent Oscillatory State Acquisition for the Manipulation of Imaging Contrast (COSMIC)

This is a fast, high resolution axial volumetric scan that provides excellent contrast among disc, muscle and bony structures, CSF and nerve tissue.

A 3D sequence used for imaging the axial spine. It uses a modified fast GRE pulse sequence with steady-state free precision segmented multi-shot centric k-space acquisition. This improves the CNR and SNR of spinal structures including the spinal cord, vertebral discs, nerve root canal and contrast between CSF and nerve roots.

# Neuro MRI: Utility of COSMIC in Diagnosis of Neurogenic Lesions of the Spine

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**“COSMIC sequencing can accurately reveal neurogenic lesions of the spine”**

### Patient history

A 32-year-old male patient presented with complaints of right buttock pain associated with diminished sensation in both legs over the past 8 months. No history of bladder or bowel involvement was reported.

### Physical examination

- Bilateral leg hypoaesthesia
- No motor weakness
- Deep tendon reflexes were normal

### Investigation

- Plain X-ray showed bony erosion of the sacrum

### MRI Technique

- Routine Sag T1/T2, Axial T1/T2 along with COSMIC sequences were performed

### Findings

A focal lesion isointense to gray matter on T1W, hyperintense on T2W was seen in the sacral spinal canal in the intradural compartment at S1 level.



Sag T1



Sag T2



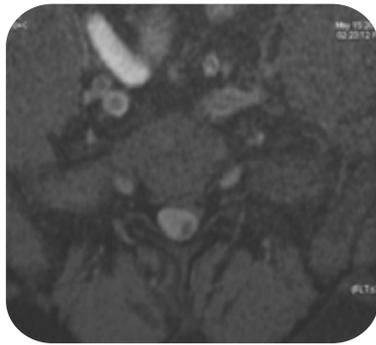
Axial T2



Axial T1



Intense homogeneous enhancement on post-contrast scan with necrosis within, and compressing the intracanalicular nerve roots at S1 level was seen. It also showed encroachment of the right neural foramen compressing the traversing right nerve roots.

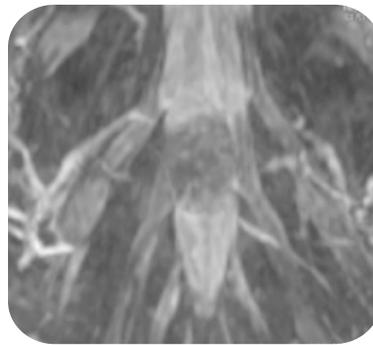
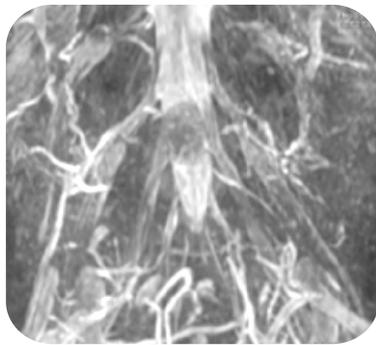


Axial T1 Fat Sat Post-Contrast



Sag T1 Fat Sat Post-Contrast

Coronal COSMIC sequences accurately reveal the lesion arising from the right traversing nerve root sheath at S1 level.



COSMIC

Image courtesy of Swastik Imaging Centre, Vashi, Navi Mumbai.

## Diagnosis

- Schwannoma or Neurofibroma

## Treatment

- Surgery was performed by the combination of an anterior and posterior approach. A subtotal piecemeal excision of tumor with sacrifice of the right S1 root was performed.
- Mild motor weakness of the hamstring was noted post-operatively.
- The neurological deficits resolved completely 1 year after surgery and follow up period was uneventful.

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