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Use of Denosumab in Treatment of Giant cell tumor of Upper Cervical Spine – A Case Report

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INTRODUCTION

- GCT of bone – A benign, locally aggressive tumor
- Incidence – 5-8%
- Treatment of choice- Extended curettage
- Upper cervical spine – An uncommon location

CHALLENGES

-Proximity to critical neurovascular structures.

-Difficult to excise and obtain tumor free margins

-Adjuvant radiotherapy – hazardous to other vital structures in the neck

-High chances of recurrence – 7-75%, even after excision

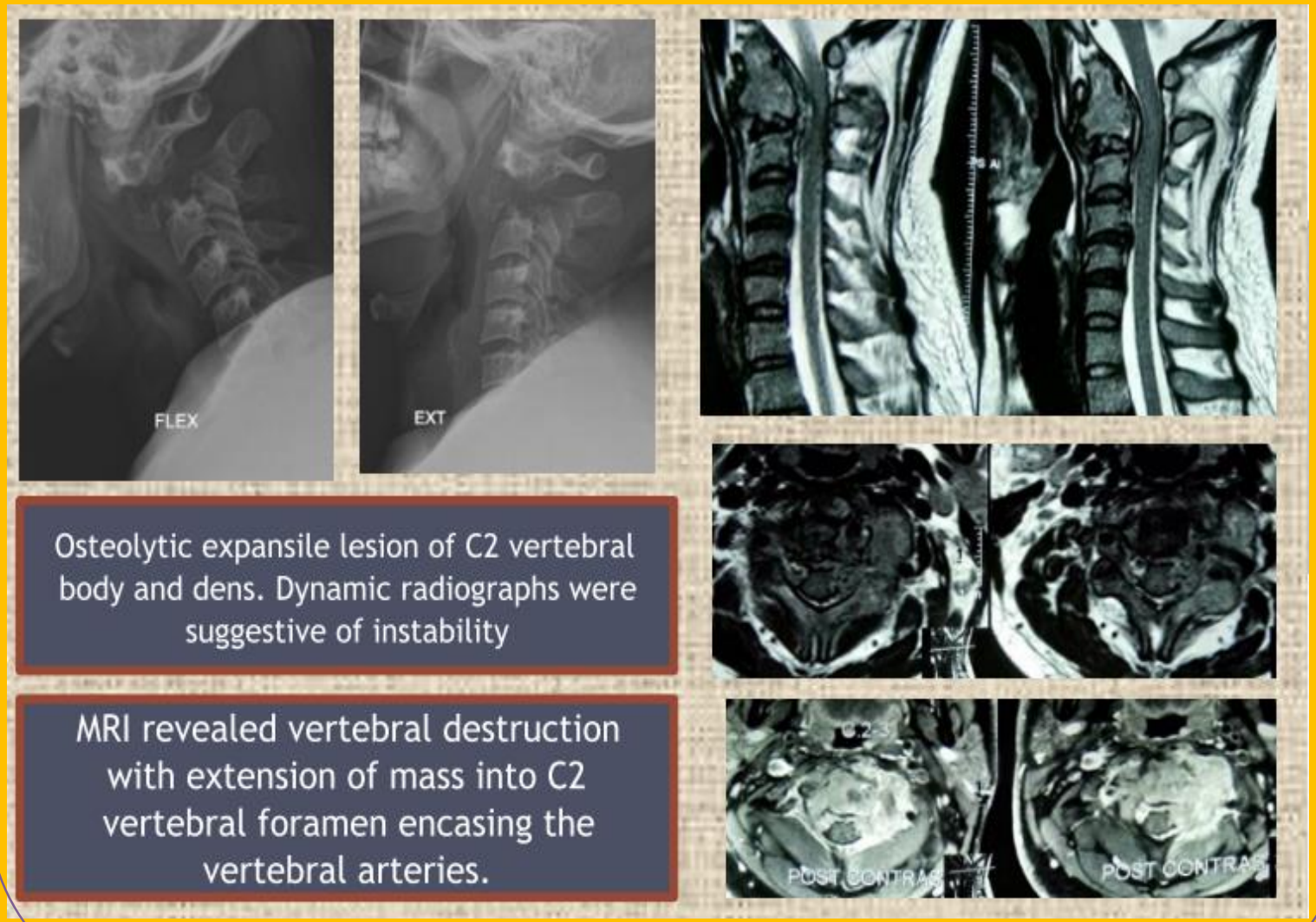
CASE REPORT

❖ 23 years, male presented with axial neck pain, gradually progressive weakness in left upper limb since 6 months.

❖ Has been elsewhere treated as Pott's spine with Antitubercular drugs for 6 months with no relief in symptoms.

❖ On presentation, had spastic ataxic gait. Romberg's sign positive. Neck pain increased on movement with radiation of pain towards left arm. Motor power in left arm was 3/5 & right arm was 4/5 (MRC). Reflexes were brisk in lower limbs & triceps and Babinski's reflex was present . No sensory disturbance. No bladder/bowel involvement.

Pre op evaluation



DENOSUMAB

MECHANISM OF ACTION

GCT consists of osteoclast-like multi-nucleated giant cells, round monocyte-like cells and spindle shaped stromal cells. Osteoclast like giant cell express receptor activator of nuclear factor kappa-B (RANK) & fibroblast like stromal cells express RANK ligand (RANKL). GCT pathogenesis is considered an imbalance of RANK-RANK ligand.

• Denosumab, a RANK-ligand human monoclonal antibody has shown promising anti-tumoral and anti-osteoclastic activity in clinical studies.

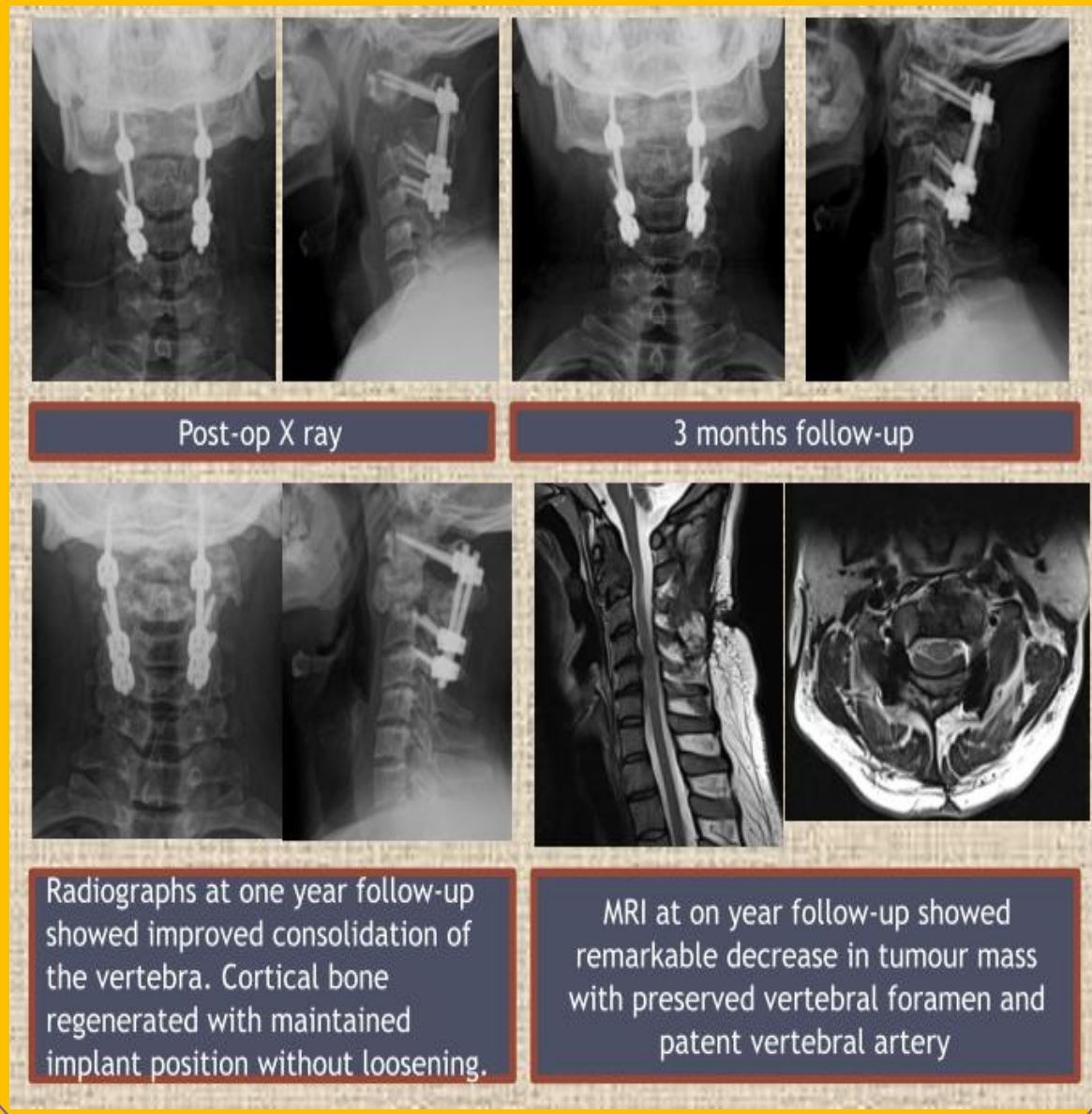
MANAGEMENT

• Biopsy and histo-pathological examination (HPE) was contemplated to ascertain the tissue diagnosis of the lesion. Biopsy was done from postero-lateral approach. HPE showed multiple spindle-shaped cell with interspersed multi-nucleated giant cells and focal areas of necrosis. These findings were highly suggestive of GCT.

• Posterior instrumented fusion procedure was done extending from C1 to C4 vertebra.

• Patient was started on Inj. Denosumab s.c. 120 mg at weekly intervals for first month and at monthly interval for next 5 months.

Post op Xray



- Patient is presently in our clinical surveillance. We continued Denosumab therapy for total duration of 6 months and offered choice to continue for 6 more months or re-start therapy if there would be any evidence of tumor recurrence.

Conclusion

- An open-label phase 2 study evaluated the effect of Denosumab in patients with GCT. Drug not only decreased the size of the tumor but also promoted new bone formation. (2)
- There are no available long term clinical studies over the use of Denosumab in GCT of cervical spine. There are few case reports describing similar results with use of Denosumab in GCT but the end point of the therapy has not been validated. (3)

References

1. Olivier Gille, Bruno de Azevedo Oliveira, Patrick Guerin Regression of Giant Cell Tumor of the Cervical Spine With Bisphosphonate as Single Therapy Spine 2012.

2. Thomas D, Henshaw R, Skubitz K, Chawla S, Staddon A, Blay JY, Roudier M, Smith J, Ye Z, Sohn W, Dansey R, Jun S. Denosumab in patients with giant-cell tumour of bone: an open label, phase 2 study. Lancel Oncol 2010.

3. Tobias A. Mattei, Edwin Ramos, Azeem A. Rehman, BS Andrew Shaw, Shreyasumar R. Patel, EhudMendel. Sustained Long-term Complete Regression of a Giant Cell Tumor of the Spine after treatment with Denosumab, The Spine Journal 2014.