MAK HILL Publications Research Journal of Medical Sciences

Case Study
doi: 10.36478/makrjms.2024.6.489.492

Curious Case of C2 Listhesis: Solving it Out of the Box

[1]Rajesh Kr. Barooah, [2]Nayan Jeet Deka and [3]Angirash Bhattacharyya

[1-3]*Department Of Neurosurgery CN Center, GMCH*

Abstract

OPEN ACCESS

Key Words
SCIs, Mayong, GMCH, Anterolithesis

Corresponding Author
Angirash Bhattacharyya,
Department Of Neurosurgery CN Center, GMCH

Author Designation
[1]Associate Professor
[2]Registrar
[3]Senior Resident

Received: 29 March 2024
Accepted: 15 May 2024
Published: 24 May 2024

Citation: Rajesh Kr. Barooah, Nayan Jeet Deka and Angirash Bhattacharyya, 2024. Curious Case of C2 Listhesis: Solving it Out of the Box. Res. J. Med. Sci., 18: 489-492, doi: 10.36478/makrjms.2024.6.489.492

INTRODUCTION

Cervical spinal cord injuries (SCIs) are among the most devastating and challenging conditions managed by healthcare professionals. Upper cervical injuries, particularly those at the C1-C4 level, are associated with significant morbidity and mortality due to the involvement of critical respiratory and autonomic functions[1]. Despite advances in acute care and rehabilitation, patients with Upper cervical injuries often experience a range of complications and long-term disabilities that significantly impact their quality of life[2].

Case Details: A 24-year-old male hailing from Mayong in Morigaon District of Assam came to Neurosurgery OPD, CN Center, GMCH on 10/10/2023 with a history of Fall from Height (approx. 10 feet) around 8 months back. On examination, the power of B/L Upper limbs were 2/5, Power of B/L lower limbs were 2/5. Hand Grip in B/L upper limbs were roughly 10%. Sensory sensation was decreased below C4. Reflexes were increased with knee and ankle clonus present. Planter was extensor. Bowel and Bladder was involved and the patient was on Per-Urethral Catheter (PUC).

Investigations: In the next one week of hospitalization, careful clinical and diagnostic evaluation was done with strict cervical spine immobilization.

- Xray Cervical Spine revealed Grade V Anterolithesis of C2 over C3
- CT CV JUNCTION confirmed the same
- CT 3D RECONSTRUCTION was also done to see the vertebral artery course
- MRI Cervical Spine with Screening of whole spine was done which revealed Grade V Anterolithesis of C2 over C3 with Severe Canal Stenosis And Cord Compression At C2-C3 Level

In addition to this all other routine pre-operative investigations were done.

Why Out of the Box? he patient was given cervical traction for 3 days after initial admission after which bedside x-ray was done. X-ray revealed that the facets were fixed without any positive result of the traction. We could not go for the ideal 360 degree fixation. The odds were against us. So there was need to think something out of the box and we planned to proceed anteriorly.

Surgical Procedure: The patient was taken up for surgery on 18/10/2023.

With the help of fluoroscopy, the transverse incision was made at the mid of C3 vertebral body.

Platysma undermined around 4cm above and below taking care of superficial draining veins. Bridging veins were coagulated.

Platysma was opened in midline laterally. Strap muscles were separated and retracted using blunt method as described Smith-Robinson's Approach (SRA).

Then the C2-C3 disc space was identified with fluoroscopy. C2-C3 and C3-C4 discectomy was performed. Then C3 Corpectomy followed by partial Corpectomy of C4 vertebra done using high speed drill to exposed the dura underneath. No CSF leak was found.

Expandable Cage (Size: 20x25mm with 4 nos. of 14 mm screws) with anterior cervical plating was done as shown in figure with screws inserted in the body of C2. Wound was then closed in layers with 10F drain. Platysma closed in interrupted fashion using Vicryl 3-0. Skin was closed with Vicryl Rapide 3-0 in subcuticular fashion.

Post op Care: Postoperatively, patients were managed in the intensive care unit (ICU) with a focus on respiratory support, hemodynamic monitoring, and prevention of complications. They received comprehensive rehabilitation, including physiotherapy of chest and limbs from post operative day 1 (POD-1). The patient was extubated on day 5. He was shift to general ward on Day 7 and discharged on Day 10 with PUC in situ. In the immediate post operative period the patient's power of limbs gradually improved which was further aided by physiotherapy. On examination, the power of B/L Upper limbs increased to4/5, Power of B/L lower limbs were 4/5. Hand Grip in B/L upper limbs increased to roughly 60%. Sensory sensation is seen to improve from POD-1.

Follow-Up: Patients were followed up at regular intervals (6 weeks, 3 months and 6 months) after discharge. Neurological status, functional outcomes, and complications were assessed at each follow-up visit. At 6 weeks follow up the patient came with normal bladder function without PUC. At 3 month follow up the patient was able to sit up from lying down position. At 6 month follow up the patient was able to walk with normal gait, brush his teeth and even shake hands.

RESULTS AND DISCUSSION

The present case study demonstrates the potential for significant improvements in neurological and functional outcomes following surgical management of Upper cervical injuries. The results of this study are not are consistent with previous studies that have highlighted the importance of early surgical

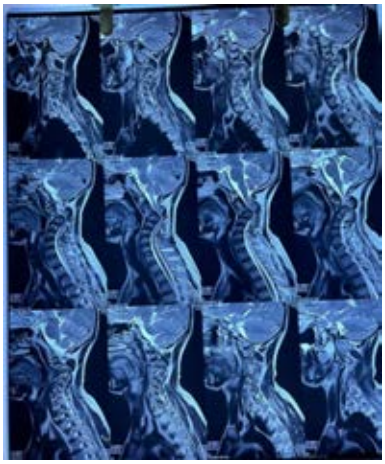

Fig. 1: Saggital mri showing grade 3 listhesis of C2 over C3

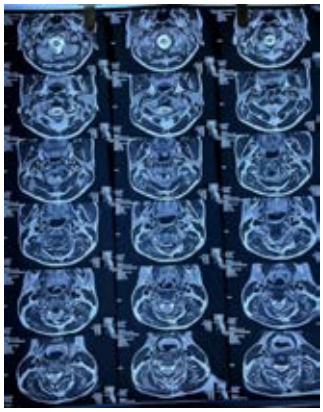

Fig. 2: Aaxial mri showing severe canal stenosis and cord compression at C2-C3 level

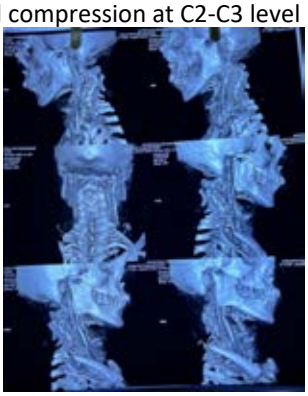

Fig. 3:CT 3D reconstruction showing vertebral artery course

Fig. 4:Intra operative fluoroscopy showing use of expandable cage with plate over C2 and C4 body

Fig. 5: Follow up XRAY after 6 weeks

Fig. 6: Follow up after 3 months

Fig. 7: Follow up after 6 months

intervention but is consistent with previous studies which emphasise the importance of multi disciplinary care and comprehensive rehabilitation in optimizing outcomes for this challenging patient population[3-5].

The mean time from injury to surgery in this study was 8 months, which is not within the range reported in previous studies[6,7]. While the optimal timing of surgical intervention remains controversial, there is growing evidence to support early surgery in patients with Upper cervical injuries[8,9]. Early surgical intervention may help to minimize secondary injury to

the spinal cord, reduce the risk of complications, and facilitate early rehabilitation[10].

The surgical approaches and procedures used in this study is out of the box and not consistent with current practice in the management of Upper cervical injuries[11]. The choice of approach and procedure depends on various factors, including the level and type of injury, the presence of spinal instability, and the surgeon's preference[12]. The low incidence of intra operative complications and the absence of surgical site infections in this case study suggest that these procedures can be performed safely in experienced hands.

However, it is important to recognize that the extent of recovery varies widely among patients and depends on various factors, including the severity of the initial injury, the timing of surgical intervention, and the intensity of rehabilitation[13,14].

Further research is needed to refine the management strategies for these complex injuries and to improve the quality of life for affected patients.

CONCLUSION

The present case study demonstrates the potential for significant improvements in neurological and functional outcomes following surgical management of Upper cervical injuries. Though early surgical intervention is the rule, yet out of the box intra operative decisions can lead to life changing post operative neurological improvement and an enhanced quality of life for affected patients.

REFERENCES

1. Kutleša, M., M. Santini, V. Krajinovic, D. Raffanelli and B. Baršic, 2010. Acute motor axonal neuropathy associated with pandemic H1N1 influenza a infection. Neurocritical Care, 13: 98-100.
2. Schuld, C., S. Franz, K. Brüggemann, L. Heutehaus, N. Weidner, S.C. Kirshblum and R. Rupp, 2016. International standards for neurological classification of spinal cord injury: Impact of the revised worksheet (revision 02/13) on classification performance. J. Spinal Cord Med., 39: 504-512.
3. Fehlings, M.G., A. Vaccaro, J.R. Wilson, A. Singh and D.W. Cadotte *et al.*, 2012. Early versus delayed decompression for traumatic cervical spinal cord injury: Results of the surgical timing in acute spinal cord injury study (STASCIS). PLoS ONE, Vol. 7 .10.1371/journal.pone.0032037.
4. Schneider, R.C., G. Cherry and H. Pantek, 1954. The syndrome of acute central cervical spinal cord injury. J. Neurosurg., 11: 546-577.
5. Lenehan, B., C.G. Fisher, A. Vaccaro, M. Fehlings, B. Aarabi and M.F. Dvorak, 2010. The urgency of surgical decompression in acute central cord injuries with spondylosis and without instability. Spine, 35: 180-186.
6. Bourassa-Moreau, É., J.M. Mac-Thiong, A. Li, D.E. Feldman, D.H. Gagnon, C. Thompson and S. Parent, 2016. Do patients with complete spinal cord injury benefit from early surgical decompression analysis of neurological improvement in a prospective cohort study. J. Neurotrauma, 33: 301-306.
7. Burke, J.F., J.K. Yue, L.B. Ngwenya, E.A. Winkler and J.F. Talbott *et al.*, 2018. Ultra-early (<12 hours) surgery correlates with higher rate of American spinal injury association impairment scale conversion after cervical spinal cord injury. Neurosurgery, 85: 199-203.
8. Jug, M., N. Kejžar, M. Vesel, S.A. Mawed, M. Dobravec, S. Herman and F.F. Bajrovic, 2015. Neurological recovery after traumatic cervical spinal cord injury is superior if surgical decompression and instrumented fusion are performed within 8 hours versus 8 to 24 hours after injury: A single center experience. J. Neurotrauma, 32: 1385-1392.
9. Dvorak, M.F., V.K. Noonan, N. Fallah, C.G. Fisher and J. Finkelstein *et al.* 2015. The influence of time from injury to surgery on motor recovery and length of hospital stay in acute traumatic spinal cord injury: An observational Canadian cohort study. J. Neurotrauma, 32: 645-654.
10. Wilson, J.R., A. Singh, C. Craven, M.C. Verrier and B. Drew *et al.*, 2012. Early versus late surgery for traumatic spinal cord injury: The results of a prospective canadian cohort study. Spinal Cord, 50: 840-843.
11. Dolan, R.T., 2016. Mechanical and cellular processes driving cervical myelopathy. World J. Orthop., 7: 20-29.
12. Joaquim, A.F. and A.A. Patel, 2013. Subaxial cervical spine trauma: Evaluation and surgical decision-making. Global Spine J., 4: 63-69.
13. Aarabi, B., M.N. Hadley, S.S. Dhall, D.E. Gelb and R.J. Hurlbert *et al.,* 2013. Management of acute traumatic central cord syndrome (ATCCS). Neurosurgery, 72: 195-204.
14. Fehlings, M.G., L.A. Tetreault, J.R. Wilson, B. Aarabi and P. Anderson *et al.*, 2017. A clinical practice guideline for the management of patients with acute spinal cord injury and central cord syndrome: Recommendations on the timing (=24 hours versus >24 hours) of decompressive surgery. Global Spine J., 7: 195-202.