CASE REPORT

GRISEL'S SYNDROME (ACUTE TORTICOLLIS): A RARE CASE REPORT FOLLOWING HEAD AND NECK INFECTION

Abid Hussain, Adnan Ahmed, Seema Nayab, Fareed Ahmed, Ulfat

Department of Radiology, Liaquat University of Medical & Health Sciences (LUMHS), Jamshoro, Pakistan.

PJR January - March 2026; 36(1): 56-59

ABSTRACT

BACKGROUND: Grisel's syndrome is a rare, non-traumatic atlantoaxial rotatory subluxation that follows inflammation or infection of the head and neck region. **CASE SUMMARY:** This paper describes a rare presentation of Grisel's syndrome in an 8-year-old girl who developed painful torticollis after an upper respiratory tract infection. CT and MRI played key roles in diagnosis, demonstrating C1-C2 rotatory subluxation (Fielding Type I) with associated soft-tissue inflammation. **CONCLUSION:** Radiological imaging, particularly CT with multiplanar reconstruction and MRI, is essential for diagnosis, classification, and assessment of soft-tissue involvement in Grisel's syndrome, enabling early and appropriate management.

Keywords: Grisel's syndrome, Atlantoaxial rotatory subluxation, CT scan, MRI, Torticollis, Cervical spine imaging

Introduction

Grisel's syndrome is a non-traumatic atlantoaxial rotatory subluxation (AARS) secondary to inflammatory processes in the head and neck.[1] It is an uncommon but important cause of acute torticollis, mainly seen in pediatric patients after upper respiratory infections or ENT procedures.[2-4]

The pathogenesis involves spread of infection through the pharyngovertebral venous plexus, leading to hyperemia and ligamentous laxity at the C1-C2 joint.[5] Because clinical presentation may mimic benign torticollis, radiologic imaging is crucial to establish the diagnosis and to rule out traumatic or congenital causes.[6-8]

Case Presentation

An 8-year-old female child was brought in with complaints of painful neck stiffness and abnormal head posture for five days following a febrile throat infection. No prior history of trauma was reported or surgery. On examination, his head was tilted to the left and rotated to the right ("cock-robin" position). No neurological deficit was found.

Radiological Findings

- **Plain Radiograph (open-mouth odontoid view):** Mild asymmetry of the lateral masses of C1 relative to the odontoid process. Findings were suspicious but non-diagnostic.[9]
- **CT Cervical Spine (axial and coronal reformats):** Demonstrated rotatory subluxation of the atlas (C1) over the axis (C2). The left lateral mass was displaced anteriorly and the right posteriorly, consistent with Fielding Type I subluxation (rotation without anterior displacement). The atlantodental interval (ADI) was normal, indicating intact transverse ligament.[2]
- **MRI Cervical Spine (T1, T2, and post-contrast):** Showed prevertebral and parapharyngeal soft-tissue edema, subtle joint effusion at the atlantoaxial articulation, and mild enhancement of adjacent soft

Correspondence : Dr. Fareed Ahmed
Department of Radiology,
Liaquat University of Medical & Health Sciences (LUMHS),
Jamshoro, Pakistan
Email: fareedbhurgri62@gmail.com

Submitted 6 December 2025, Accepted 29 December 2025

tissues. No epidural collection or spinal cord compression was seen.[9-11]

Diagnosis: Grisel's Syndrome secondary to post-infectious inflammation.
A brief course of conservative therapy was instituted, and the patient showed full recovery on follow-up imaging.[13]

Discussion

Radiologic imaging is the cornerstone in diagnosing Grisel's syndrome.[5-7]
Plain radiographs may suggest asymmetry but often miss subtle rotations.[9]
Computed tomography (CT) is considered the gold standard, as it accurately demonstrates the direction and degree of C1-C2 rotation and allows Fielding and Hawkins classification.[2,8]
Magnetic resonance imaging (MRI) complements CT by assessing soft-tissue inflammation, ligament integrity, and neural involvement.[9-12]

Figure 1: Axial CT images show rotatory subluxation of C1 over C2 with anterior displacement of the left lateral mass. It is associated with a mild hypodense collection in the retropharyngeal space along the posterior aspect of C1 and C2, consistent with Fielding Type I atlantoaxial rotatory subluxation.

Figure 2: CT findings (coronal view - head & neck)

Figure 3: Sagittal T2-weighted MRI showing prevertebral soft-tissue edema and preserved spinal cord alignment.

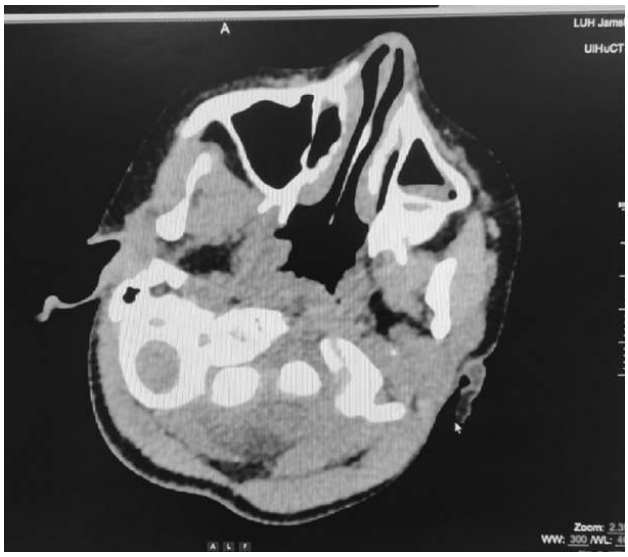

Figure 4:

Imaging Differential Diagnosis:

- Traumatic C1-C2 subluxation (with fracture lines)
- Congenital rotational anomalies
- Retropharyngeal abscess with secondary torticollis
- Neoplastic infiltration or osteomyelitis

Recognizing the characteristic imaging pattern-rotatory displacement of C1 on C2 with normal ADI and inflammatory soft-tissue changes-helps differentiate Grisel's syndrome from other causes.[10,11]

Radiologist's Role:

Radiologists play a pivotal role by:

1. Confirming atlantoaxial subluxation type.[2,8]
2. Assessing the extent of inflammatory spread.[9-12]
3. Excluding spinal cord or ligament injury.[14]
4. Assisting clinicians in early, non-surgical management decisions.[13,15]

Conclusion

Grisel's syndrome should be considered in any child presenting with painful torticollis following head or neck infection.[1-3]

CT and MRI are indispensable for diagnosis and classification, ensuring prompt recognition and prevention of complications.[8-12]

Radiologists must be familiar with the imaging spectrum of this entity to guide appropriate management.[14,15]

CONFLICT OF INTEREST: None

References

1. Grisel P. Enucléation de l'atlas et torticolis naso-pharyngien. Presse Méd. 1930; **38:** 48-9.
2. Fielding JW, Hawkins RJ. Atlanto-axial rotatory fixation. J Bone Joint Surg Am. 1977; **59(1):** 37-44.
3. Wetzel FT, La Rocca H. Grisel's syndrome. Clin Orthop Relat Res. 1989; **(240):** 141-52.
4. Mathern GW, Wilson BC, Jarvis BL, Haydon RC. . Nontraumatic atlantoaxial subluxation: Grisel's syndrome in children. Radiology. 1987; **162:** 557-60.
5. Shroff M, et al. Non-traumatic atlantoaxial subluxation (Grisel's syndrome): Imaging findings and review. Pediatr Radiol. 1998; **28(7):** 478-81.
6. Battiata AP, Pazos G. Grisel's syndrome: The two-hit hypothesis - a case report and literature review. Ear Nose Throat J. 2004; **83(8):** 553-5.
7. Kulkarni AG, Shah KC, Parikh SN. Grisel's syndrome: A case report with review of literature. J Postgrad Med. 2001; **47:** 116-8.
8. Jain V, et al. Radiological evaluation of atlantoaxial rotatory subluxation: Role of dynamic CT scan. Indian J Radiol Imaging. 2014; **24(1):** 56-60.
9. Papadopoulou F, et al. MRI in pediatric non-traumatic atlantoaxial rotatory subluxation. Neuroradiology. 2006; **48:** 637-42.
10. Sethi KS, et al. Grisel's syndrome: Imaging perspective. Indian J Radiol Imaging. 2019; **29(4):** 397-401.
11. Noguera A, et al. Grisel's syndrome: Imaging findings and differential diagnosis. Radiol Case Rep. 2021; **16(1):** 67-71.
12. Shakya D, et al. CT and MRI correlation in diagnosing

Grisel's syndrome: A case series. Eur J Radiol Open. 2020; **7:** 100246.

13. Oda T, et al. Conservative management of Grisel's syndrome with imaging follow-up. Spine J. 2017; **17(3):** e83-e88.

14. Hegazy AM, et al. Imaging spectrum of inflammatory atlantoaxial subluxation: Grisel's syndrome revisited. Clin Imaging. 2023; **97:** 89-95.

15. de Souza C, et al. Grisel's syndrome: Radiologic-clinical correlation and review. J Radiol Case Rep. 2024; **18(2):** 45-52.