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The Curious Case of Rat Tail Syndrome: A Rare Clinical Presentation

Dr. Sagarika B[1], Dr. Swapnil Annasaheb Pattanshetti[2], Dr. Manjunath Shivapujimath[3], Dr. Vineeta Gautam[4]

[1]Postgraduate in General Surgery, Jawaharlal Nehru Medical College, KAHER, Belagavi

Email ID: sagarikabalakrishna@gmail.com

[2]Associate Professor, Department of Pediatric Surgery, Jawaharlal Nehru Medical College, KAHER, Belagavi

Email ID: swapnilpattanshetti@gmail.com

3Assistant Professor, Jawaharlal Nehru Medical College and Research Centre Academic Degrees: MBBS, MD (Anaesthesia), Fellowship in Paediatric Anaesthesia.

Email ID: manjushivapujimath@gmail.com

4Senior Resident, Department of Pediatrics, Jawaharlal Nehru Medical College, KAHER, Belagavi.

Email ID: vineeta.bims@gmail.com

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ABSTRACT

Background: Rat tail syndrome is a descriptive term occasionally used to refer to rare distal spinal hypoplasia resembling a thin, tapering tail. It often falls under the spectrum of caudal regression syndrome (CRS), a rare congenital disorder characterized by partial or complete agenesis of the sacrococcygeal spine. CRS is typically associated with maternal diabetes and other syndromic conditions, although idiopathic cases can occur.

Case-Presentation: We report the case of a 1-year-old female infant, the first-born child of healthy non-consanguineous parents. She was delivered at term via normal vaginal delivery, with an uneventful perinatal period and no neonatal intensive care requirement. There was no maternal diabetes or antenatal complications. Patient had a swelling since birth which gradually increased in size and during a routine pediatric check-up, abnormal spinal curvature and a blunted gluteal cleft were noted. Neurological examination revealed mild hypotonia in the lower limbs with normal bladder and bowel function. MRI of the lumbosacral spine revealed hypoplastic sacrococcygeal vertebrae, a low-lying conus medullaris ending at L5 and a thickened filum terminale—findings consistent with tethered cord syndrome within the CRS spectrum. The patient underwent successful untethering surgery via laminectomy. Postoperative recovery was uneventful, and at 6- month follow-up, she demonstrated improved tone and independent walking.

Conclusion: This case highlights a rare, idiopathic presentation of caudal regression syndrome resembling rat tail morphology in a healthy term infant. Early detection through clinical suspicion and imaging, followed by timely surgical intervention, can significantly improve neurological outcomes and prevent long-term complications.

1. INTRODUCTION

Rat tail syndrome is a descriptive term used for spinal anomalies where the caudal portion of the spine tapers to a narrow, hypoplastic end, resembling a rat's tail. This condition may overlap with caudal regression syndrome (CRS) and other neural tube defects. CRS is a rare congenital disorder with an incidence of 1 in 25,000 live births and is commonly associated with maternal diabetes, although idiopathic cases exist [1]. Literature describing the clinical and surgical management of isolated distal spinal hypoplasia remains sparse. This report aims to present a unique neonatal case, detailing imaging findings, surgical management, and outcome.

2. CASE PRESENTATION

Patient Details: A one-year female infant, with no comorbidities or complications at birth or ICU admission, significant antenatal risk factors and no history of maternal diabetes.

Clinical Findings:

During the physical examination, the infant was noted to have a blunted gluteal cleft and mild scoliosis. There was no visible sacral dimple or sinus. Neurologically, the infant exhibited mild hypotonia in the lower limbs with preserved reflexes. She had normal bladder and bowel continence. A thorough systemic examination was unremarkable.

MRI of the lumbosacral spine revealed hypoplasia of the sacrococcygeal vertebrae, a low-lying conus medullaris ending at the L5 level and a thickened filum terminale—findings consistent with tethered cord syndrome within the spectrum of caudal regression syndrome. No syringomyelia or split cord malformation was noted.

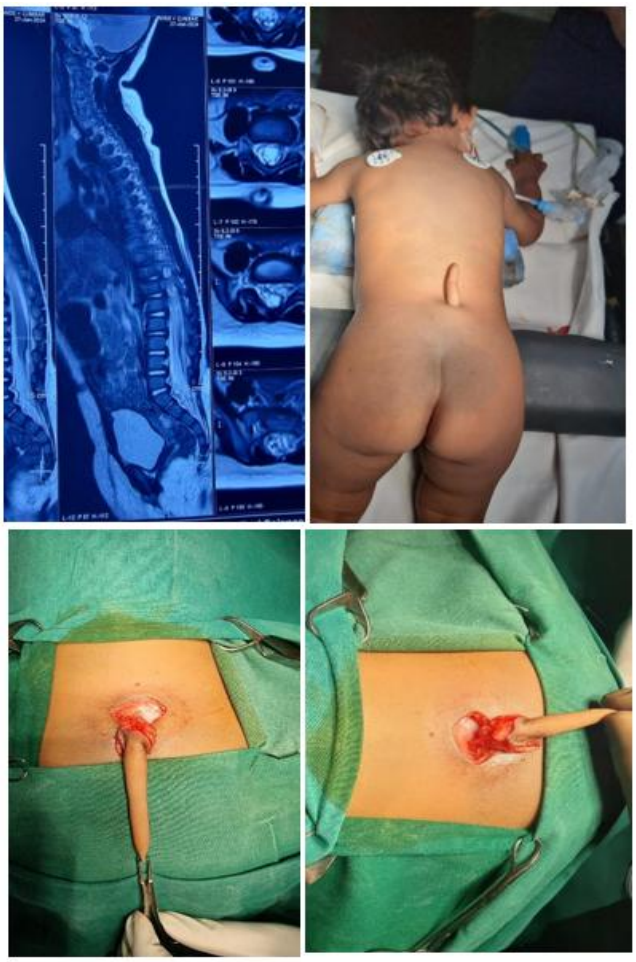
Intervention:

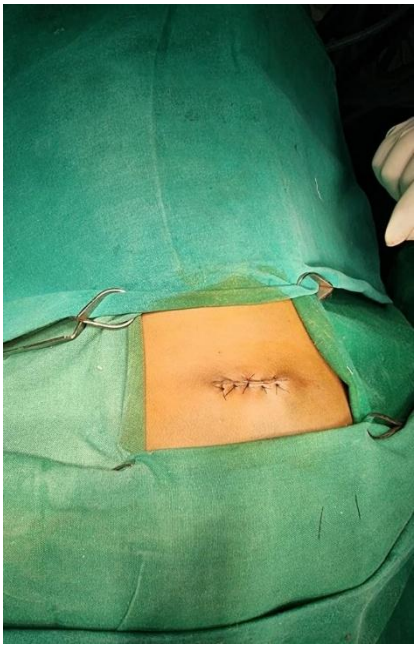
Following neurosurgical evaluation, the patient was scheduled for elective untethering of the spinal cord. Pre- operative workup included routine blood tests, urine analysisand anesthesia clearance. Under general anesthesia, a laminectomy at the L5-S1 level was performed and the filum terminale was identified and sectioned to release the tethered cord. Intra-operative neuromonitoring was used to prevent injury to functional nerve roots.

Postoperatively, the patient was monitored in the pediatric surgery unit. There were no complications such as cerebrospinal fluid leak, wound infection, or neurological deterioration. She was discharged on postoperative day 5 with physiotherapy advice.

Outcomes:

At 6-month follow-up, the child demonstrated improved tone in the lower limbs, increased strength and independent ambulation. There were no signs of recurrence or complications. Urodynamic testing showed normal bladder function and there was no deterioration in bowel control. She continues under regular follow- up with pediatric neurology and physiotherapy services and her developmental milestones have normalized.





3. DISCUSSION

Rat tail syndrome is a descriptive but non-standard term occasionally used in literature to describe tapering or hypoplastic distal spines, often within the caudal regression spectrum. Caudal regression syndrome itself encompasses a range of spinal and lower limb anomalies, from partial sacral agenesis to complete absence of lumbosacral vertebrae [2].

The embryological basis lies in defective development of the caudal mesoderm during the third to seventh week of gestation, possibly linked to teratogenic exposure, vascular anomalies, or genetic factors [3].

MRI plays a pivotal role in diagnosis, allowing delineation of vertebral hypoplasia, conus position and associated cord anomalies. Surgical intervention, particularly for tethered cord, is recommended early to prevent progression of neurologic deficits [4].

This case is unique in its early diagnosis, absence of maternal diabetes and isolated spinal involvement without genitourinary or gastrointestinal defects. Early surgical management led to favourable neurological outcomes, supporting early detection and treatment in similar presentations.

4. CONCLUSION

We report a rare case of an infant with a rat tail–like spinal anomaly consistent with caudal regression syndrome. Early imaging and prompt neurosurgical intervention resulted in improved functional outcomes. Greater awareness of atypical presentations of CRS is essential for timely diagnosis, intervention and counselling of parents.

Intervention:

Following neurosurgical evaluation, the patient was scheduled for elective untethering of the spinal cord. Pre- operative workup included routine blood tests, urine analysisand anesthesia clearance. Under general anesthesia, a laminectomy at the L5-S1 level was performed and the filum terminale was identified and sectioned to release the tethered cord. Intra-operative neuromonitoring was used to prevent injury to functional nerve roots.

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REFERENCES

[1] Tortori-Donati P, Fondelli MP, Rossi A, Cama A. Spinal dysraphism: A review of neuroradiological features with embryological correlations and proposal for a new classification. Neuroradiology. 2000;42(7):471–491.

[2] Pang D, Dias MS, Ahab-Barmada M. Split cord malformation: Part I: A unified theory of embryogenesis for double spinal cord malformations. Neurosurgery. 1992;31(3):451–480.

[3] Singh SK, Singh RD, Pradhan M. Caudal regression syndrome: A rare case with spinal, urogenital and gastrointestinal anomalies. BMJ Case Reports.;2011: bcr0120113763.

[4] Tortori-Donati P, Rossi A, Biancheri R, Cama A. Magnetic resonance imaging of spinal dysraphism. Top Magn Reson Imaging. 2001;12(6):375–409.