

INTRODUCTION

- Adult reports of resuscitated cardiac arrest associated with spinal cord ischemic infarction
- Spinal cord ischemic infarction **rarely reported in pediatrics**
- Described in patients with **susceptibilities** like prematurity, cardiopathies and vascular anomalies
- Spinal cord ischemic infarction in children with severe HIE after resuscitated cardiac arrest is not well-described and is potentially **underrecognized**.

OBJECTIVES

Describe two cases of children with diffuse spinal cord ischemic infarction following prolonged out-of-hospital cardiac arrest.

METHOD

Case series

AUTHORS

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RESULTS

Case 1:

- Previously healthy 5-month-old male with prolonged out-of-hospital cardiac arrest at home
- ROSC achieved after 90 minutes.
- Initial course: multiple intubation failures, high inotropic support, prolonged hypoxemia (sat 80-88% for several hours).
- Initial GCS 3 with fixed, dilated pupils & CT revealed diffuse edema, multiple/diffuse subdural hemorrhages, and extensive anoxic insult.
- *Clinical exam:* lack of brainstem reflexes, absence of spinal reflexes and loss of rectal tone.

Case 2:

- Previously healthy 2-year-old with hypoxic cardiac arrest in the context of foreign body aspiration.
- ROSC obtained after 60 min.
- Initial course: prolonged hypoxia with sat 57-90% for several hours & required high-dose inotropic support.
- *Clinical exam:* GCS 3. Remained unresponsive with no brainstem reflexes, absent spinal reflexes and loss of rectal tone.

In both cases, the presence of spinal cord injury precluding determination of death by neurological criteria on clinical grounds, life-sustaining therapies were withdrawn, and children died.

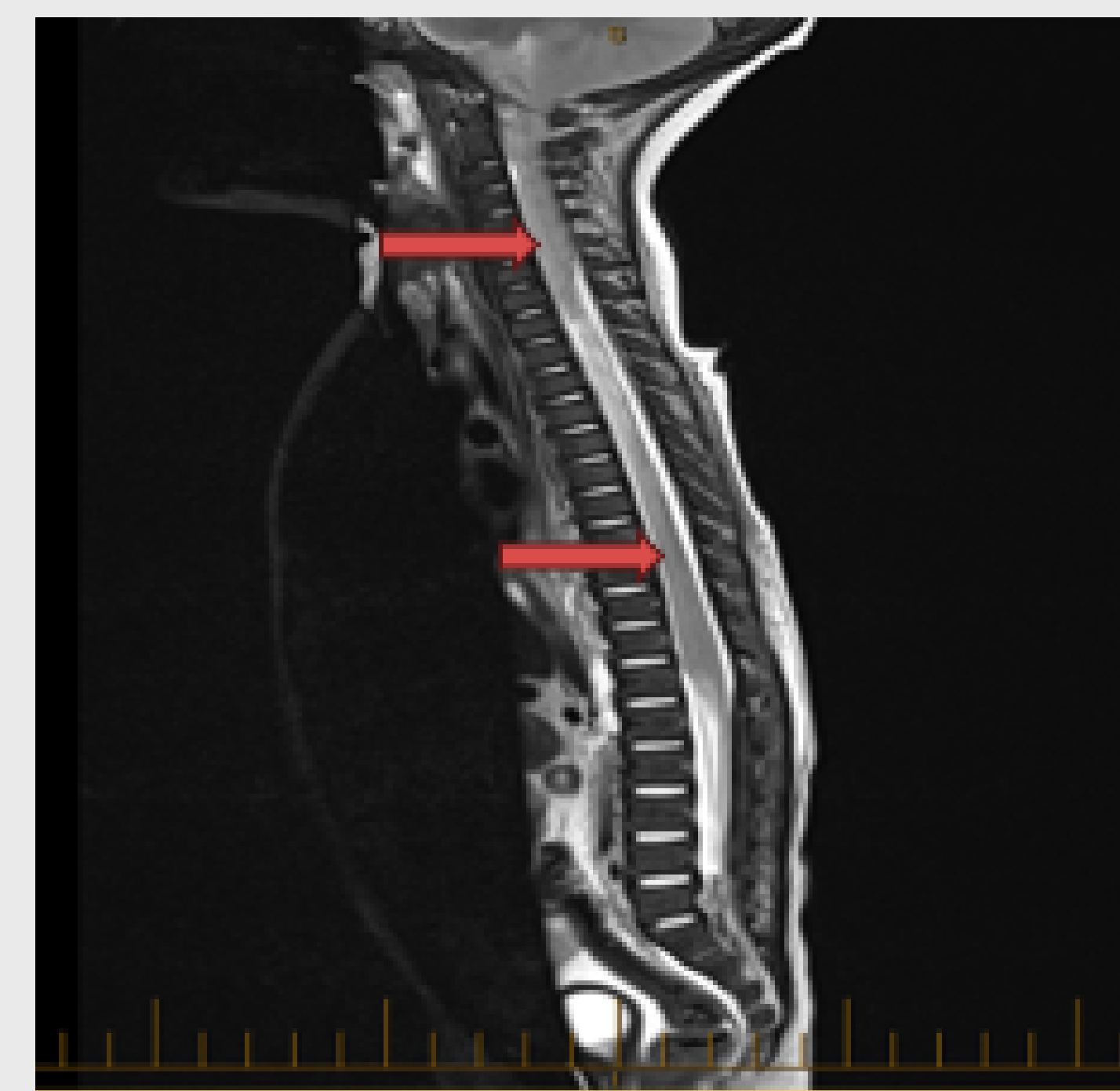


Figure 1. Case 1 – Spine MRI: There is diffuse spinal cord ischemic injury with enlargement of the cord related to swelling more pronounced at the cervical cord level, diffuse extensive restricted diffusion extending from the cervicomedullary junction to the distal tip of the conus medullaris, hyperintense T2 signal involving more the central grey matter than the white matter of the cord diffusely. No evidence of intramedullary bleed based on T1 and T2 mapping. There is an intracanal bleed on the caudal aspect of the thoracic sac showing dependent hyperintense T2, hyperintense T1 signal at the lumbosacral spine level from L1 level and below. There is no associated epidural or subdural bleed seen. There are no signs of spinal vertebral injury. The vertebrae are well aligned. There is no signs of disc or ligamentous injury.



Figure 2. Case 2 – Spine MRI – Head and spine MRI are performed with no IV contrast injection on 3 Tese magnet. Brain shows diffuse brain edema with sulcal and cerebellar hemispheric atrophy. There is abnormal finding of extensive restricted diffusion of the spinal cord on the entire length, associated with central hyperintense T2 signal of the cervical cord, of the conus medullaris and distal thoracic cord, mostly involving the grey matter. There is dilatation of the central spondylar canal of the thoracic cord and conus medullaris.

CONCLUSION

- Two children with severe hypoxic-ischemic brain injury, absent spinal motor reflexes and loss of rectal tone after resuscitated cardiac arrest had non-traumatic diffuse **ischemic infarction of the spinal cord**.
- Ischemic infarction most likely a direct result of **hypoperfusion and hypoxia** during resuscitation and post-ROSC period.
- Spinal cord ischemic infarction is a **potentially underrecognized complication** of cardiac arrest in children and further research is needed to define incidence and risk factors.
- Implications on **post-cardiac arrest evaluation and care** in children.
- Spinal cord ischemic infarction associated with HIE in children may be an underrecognized potential confounder in the clinical determination of death by neurological criteria.

CONTACT INFORMATION

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ACKNOWLEDGEMENTS

We thank the families of both patients for allowing us to report these cases.

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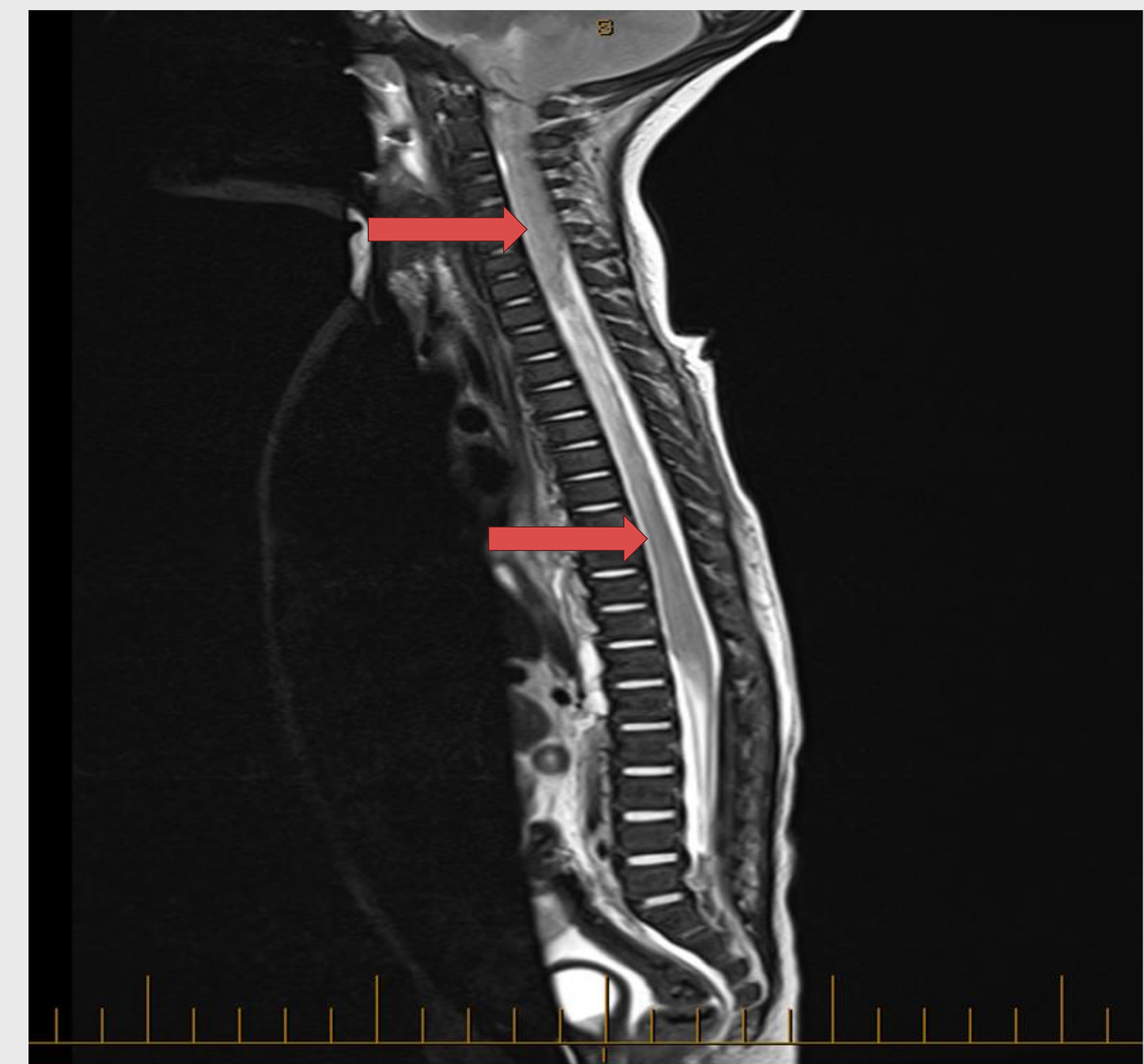


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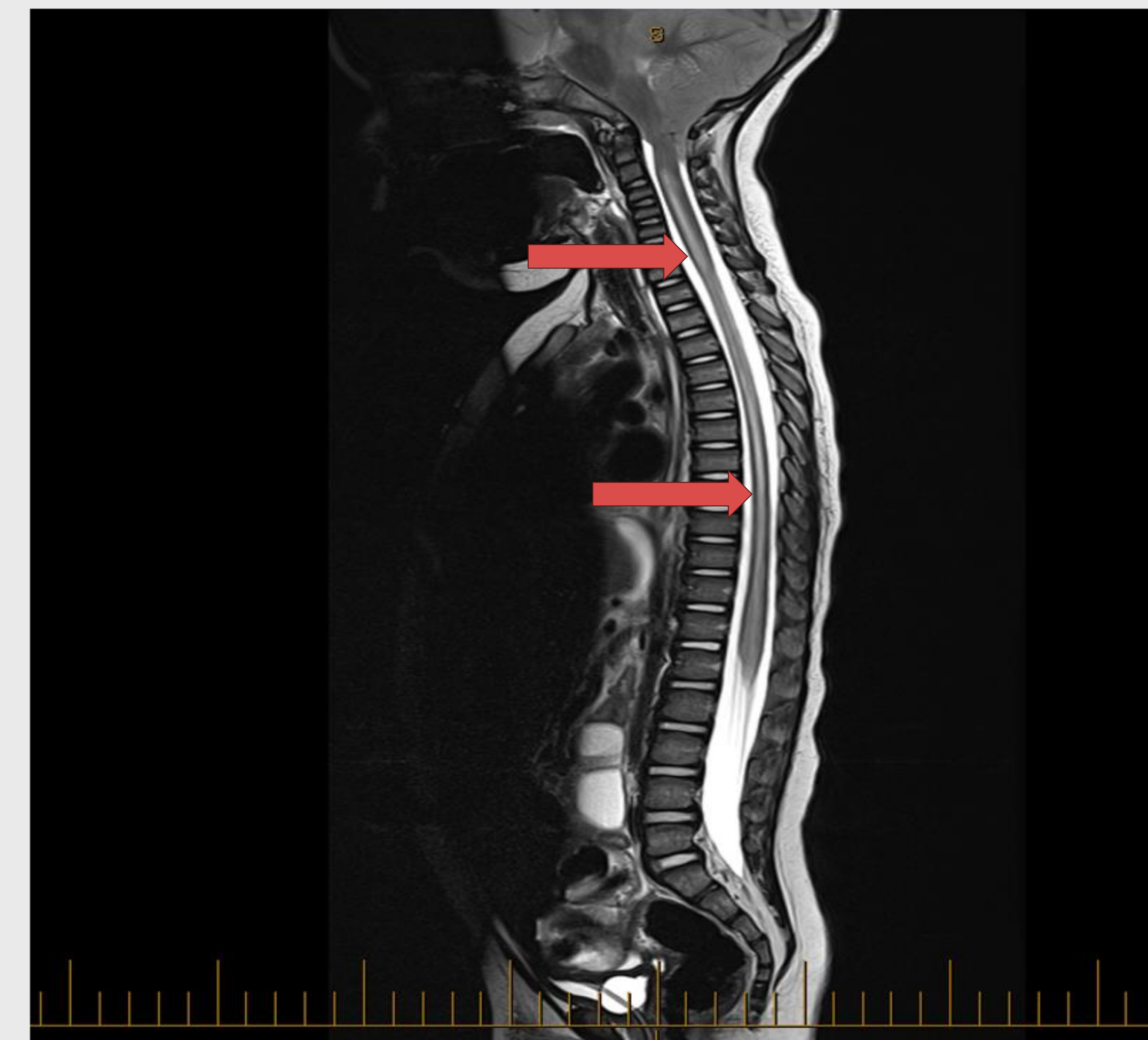


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