

Unilateral Duane syndrome

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Section: Neuroradiology

Area of Interest: Neuroradiology brain Eyes

Procedure: Imaging sequences

Imaging Technique: MR

Special Focus: Epidemiology Tissue characterisation

Case Type: Clinical Cases

Authors: Ahire Pankaj

Patient: 4 years, female

Clinical History:

4-year-old female child came with chief complaints of restriction of eye movement on the left side. She was unable to abduct the left eye. Her neurodevelopment was normal.

Imaging Findings:

MR imaging with axial 3D gradient nerve sequence revealed absent left abducens (VI) nerve.

Right abducens nerve was normal in course and calibre.

Cerebral parenchyma and orbital sections showed no significant abnormality.

Discussion:

Duane syndrome is an eye movement disorder characterised by either restriction or reduced movement in adduction, abduction or both movements of the ipsilateral eye.

According to inability of a particular movement, it has been classified as:

Duane type I which affects abduction movement, Duane type 2 which affects adduction movement, and Duane type 3 which affects both movements [1].

Causes of Duane syndrome are complex with most of the cases being sporadic. Few cases show a familial pattern.

Duane syndrome contributes to 1-5 % of the total eye movement disorders with female preponderance [1].

The main pathology seen in absent abducens (VI) nerve, which supplies the lateral rectus muscle. Instead of the abducens nerve, a branch of the oculomotor (III) nerve supplies the ipsilateral lateral rectus muscle [1].

Imaging with MR helps to look for absence of the abducens nerve in this eye movement disorder.

MR imaging is important predominantly with 3D gradient nerve sequence which reveals absent cisternal portion of abducens nerve at pontomedullary sulcus [2].

Treatment of Duane syndrome is symptomatic, either managed conservatively or surgically.

Surgical treatment is recession and transposition of muscle, however, the main pathology of absent abducens nerve cannot be treated. The outcome also depends on associated syndromes like Mobius syndrome, Goldenhar syndrome, Holt-Oram and Okihiro's syndrome [1].

Patients presenting with eye movement disorders should be imaged carefully with thin nerve sequence to differentiate absence of nerve, palsy or orbital pathology.

Differential Diagnosis List: Unilateral Duane syndrome on the left side., Abducens nerve palsy, Strabismus

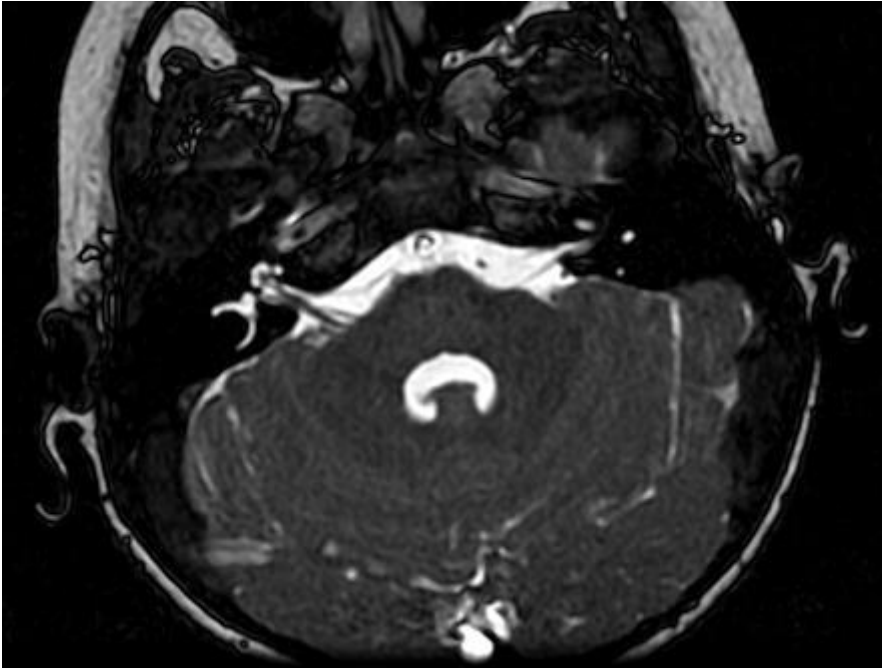
Final Diagnosis: Unilateral Duane syndrome on the left side.

References:

(2015) <https://rarediseases.org/rare-diseases/duane-syndrome/>. NORD
Jae Hyung Kim and Jeong-Min Hwang (2005) Usefulness of MR Imaging in Children without Characteristic Clinical Findings of Duane's Retraction Syndrome. American Journal of Neuroradiology 26(4) 702-705. (PMID:[15814908](#))

Figure 1

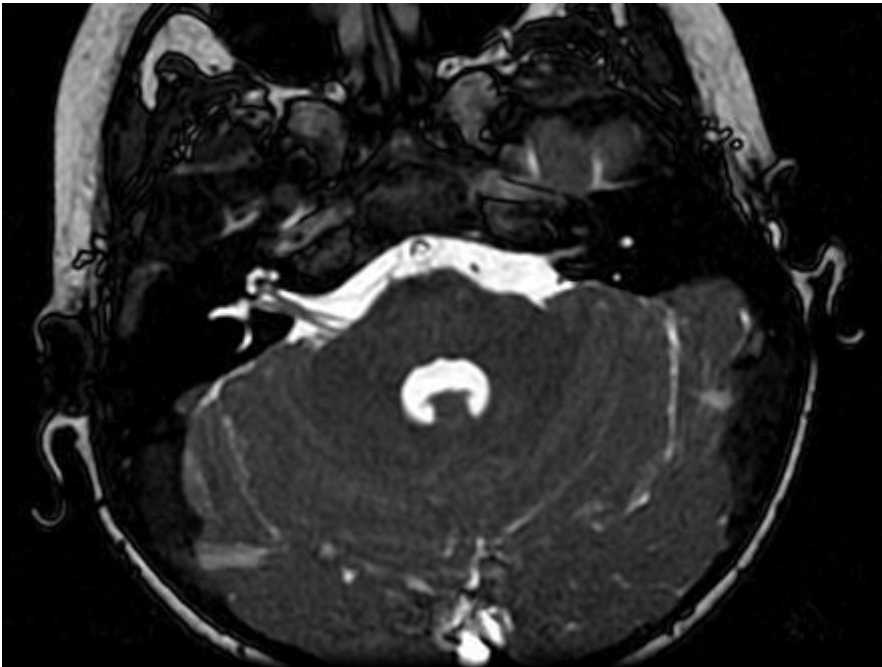
a



Description: Axial 3D GRE FIESTA nerve sequence showing pontomedullary sulcus with the origin of right abducens nerve.

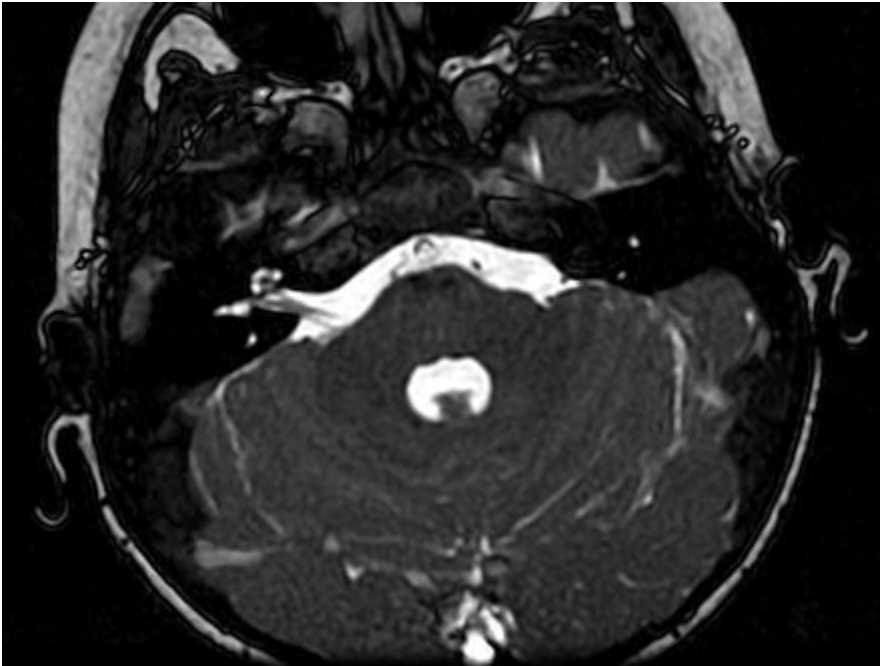
On left side there is flow void of anterior inferior cerebellar artery. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

b



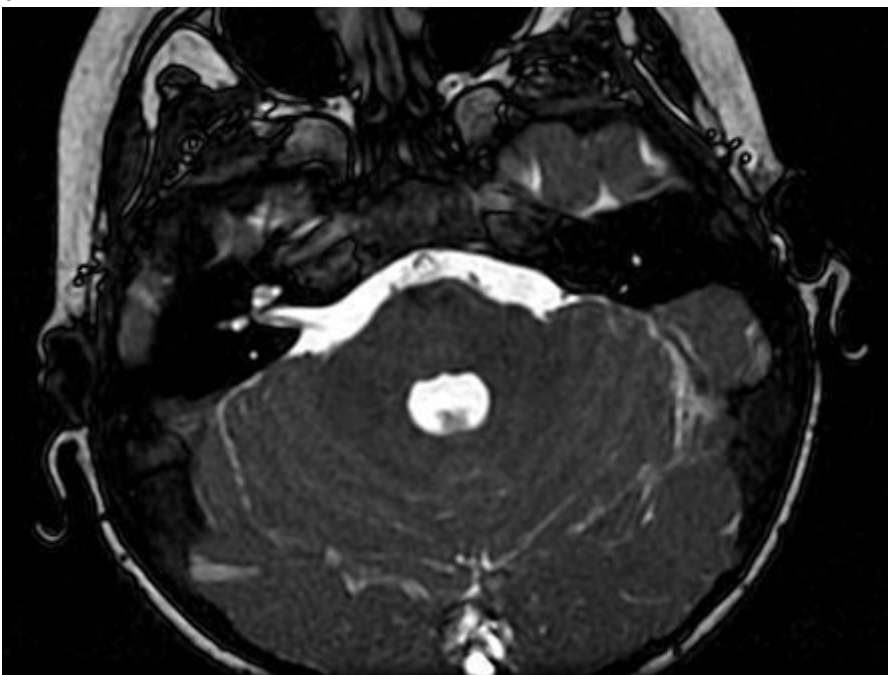
Description: Axial 3D GRE FIESTA nerve sequence showing origin of right abducens nerve at pontomedullary sulcus. On left side origin of abducens nerve is not seen. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

c



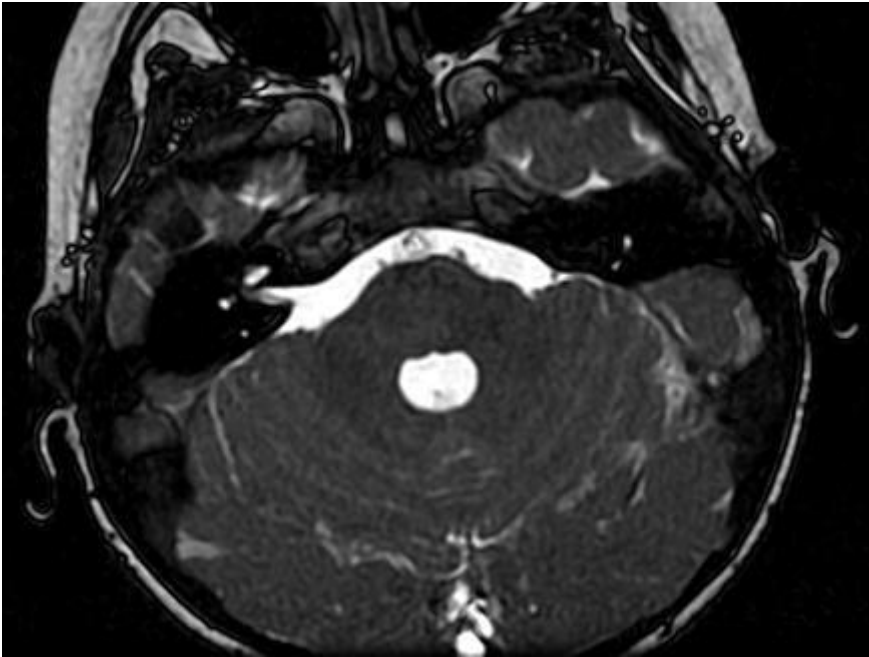
Description: Axial 3D GRE FIESTA nerve sequence showing origin of right abducens nerve at pontomedullary sulcus. On left side origin of abducens nerve is not seen with flow void of anterior inferior cerebellar artery. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

d



Description: Axial 3D GRE FIESTA nerve sequence showing origin of right abducens nerve. Left abducens nerve is not seen with flow void of anterior inferior cerebellar artery. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

e



Description: Axial 3D GRE FIESTA nerve sequence showing cisternal portion of right abducens nerve. Left-sided abducens nerve is not seen with flow void of anterior inferior cerebellar artery. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

f



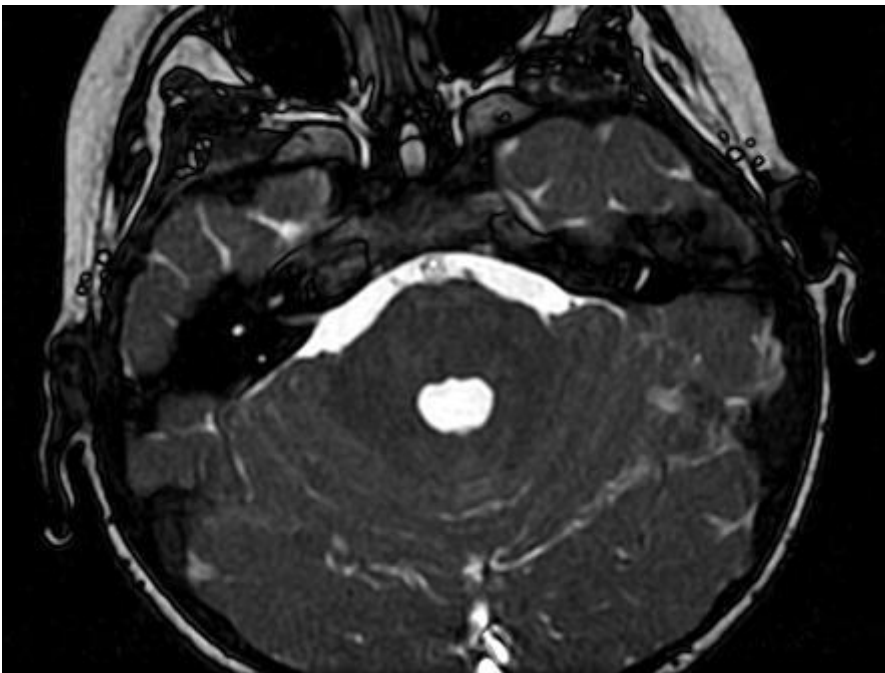
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g



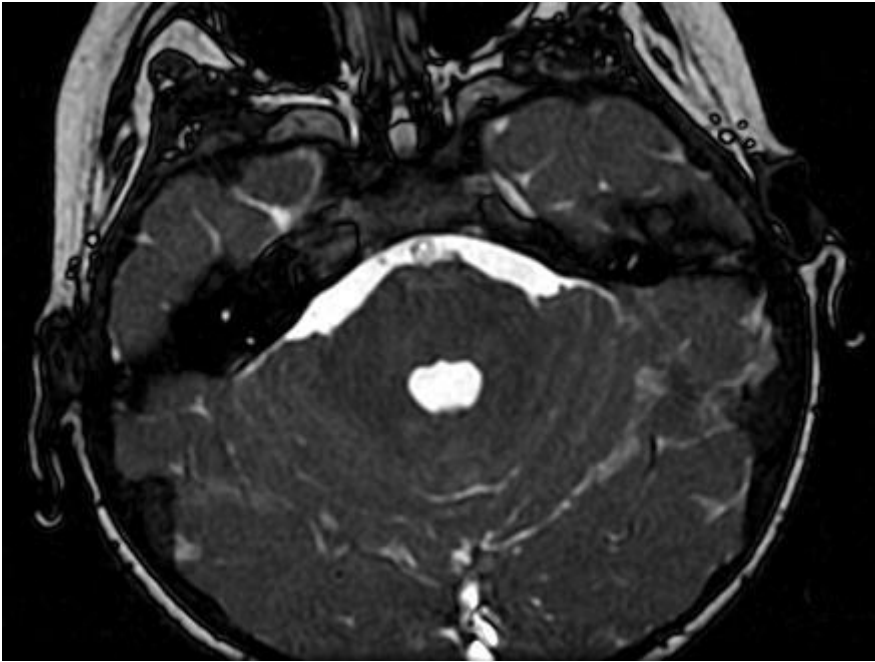
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h



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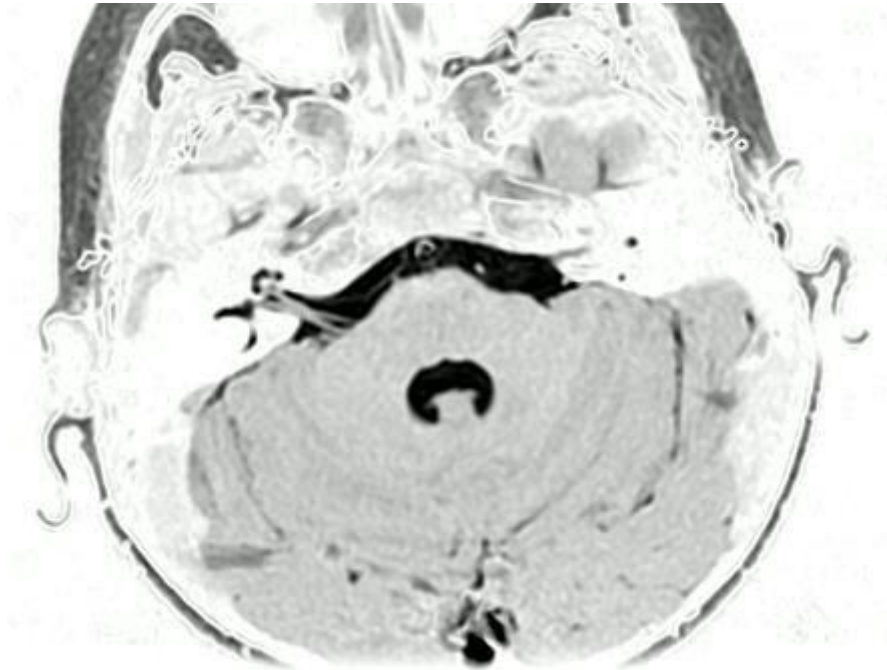
i



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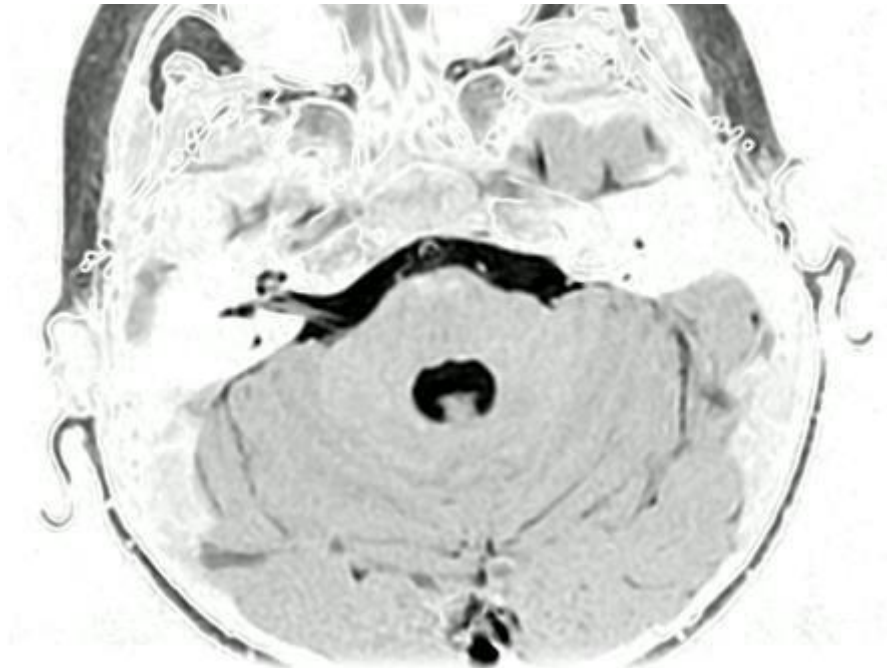
Figure 2

a



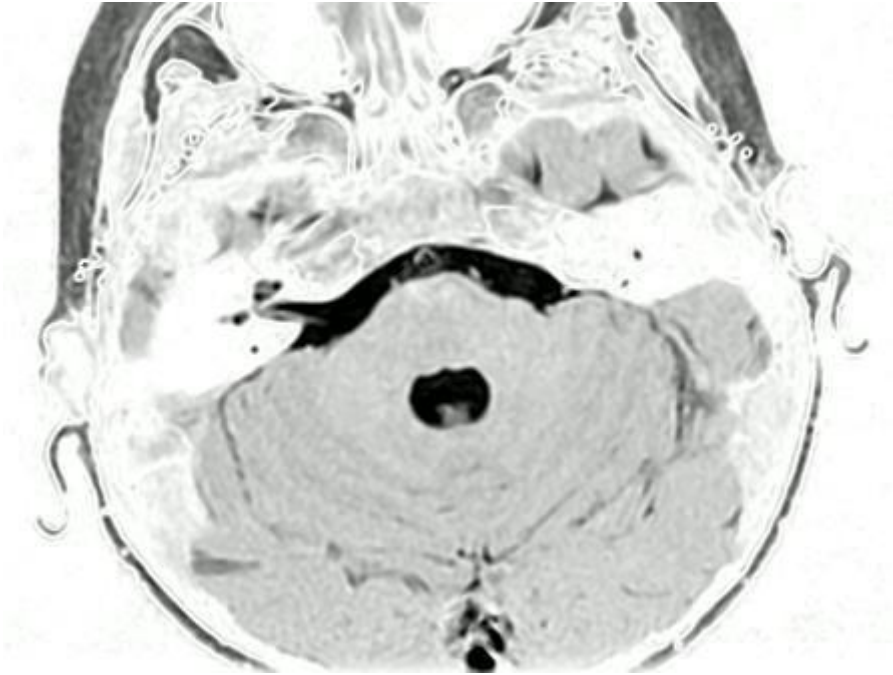
Description: Axial inversion image showing origin of right abducens nerve with absent left abducens nerve. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

b



Description: Axial inversion image showing origin of right abducens nerve with absent left abducens nerve. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

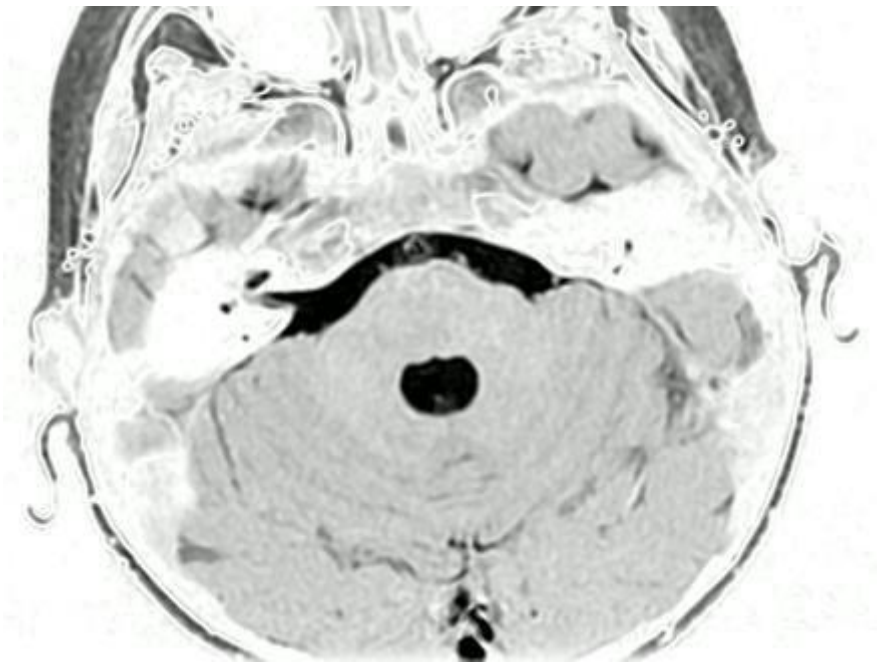
c



Description: Axial inversion image showing origin of right abducens nerve with absent left abducens nerve.

Flow void of anterior inferior cerebellar artery seen on left side. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

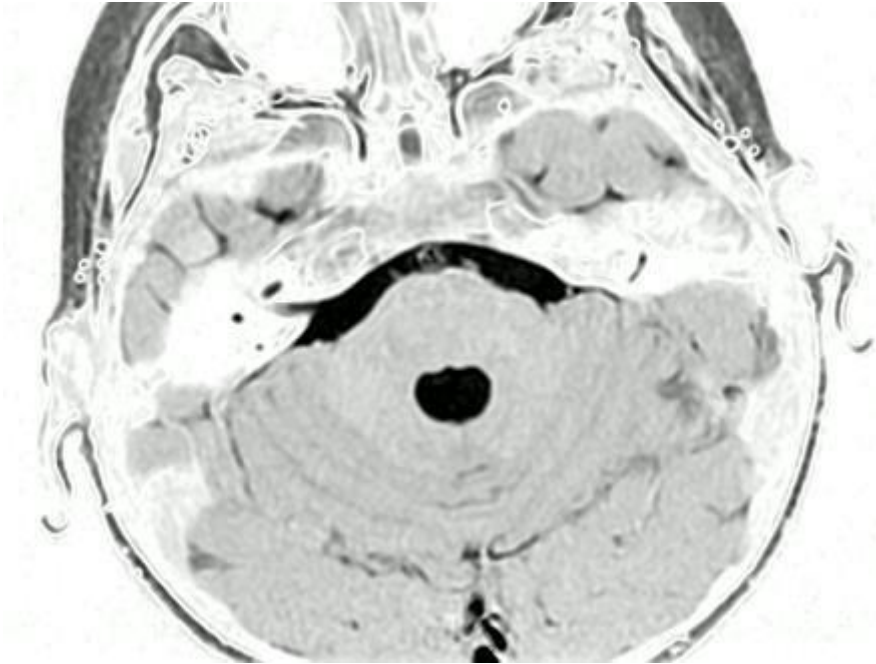
d



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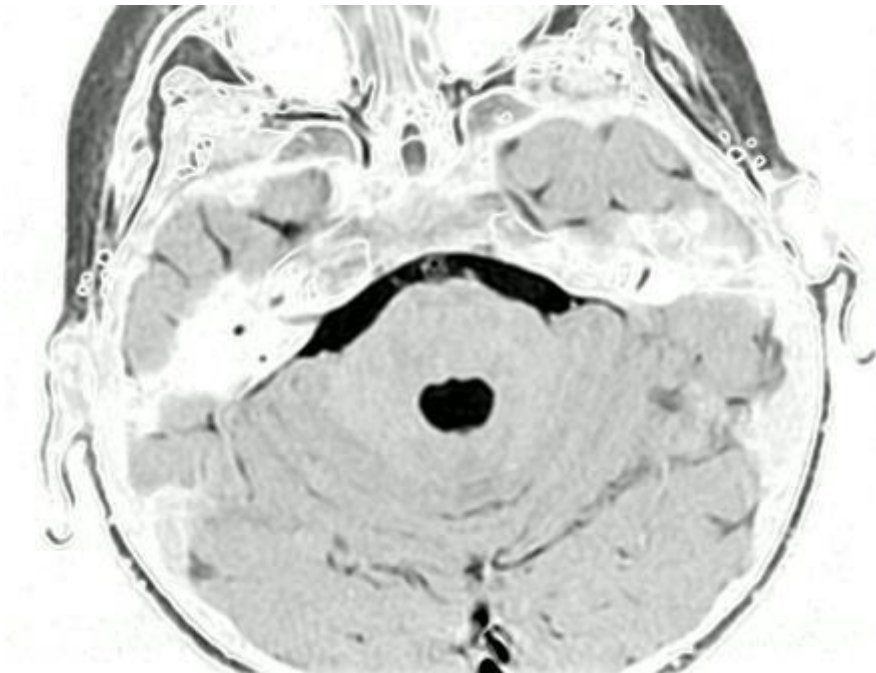
e



Description: Axial inversion image showing cisternal portion of right abducens nerve with absent left abducens nerve.

Flow void of anterior inferior cerebellar artery seen on left side. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

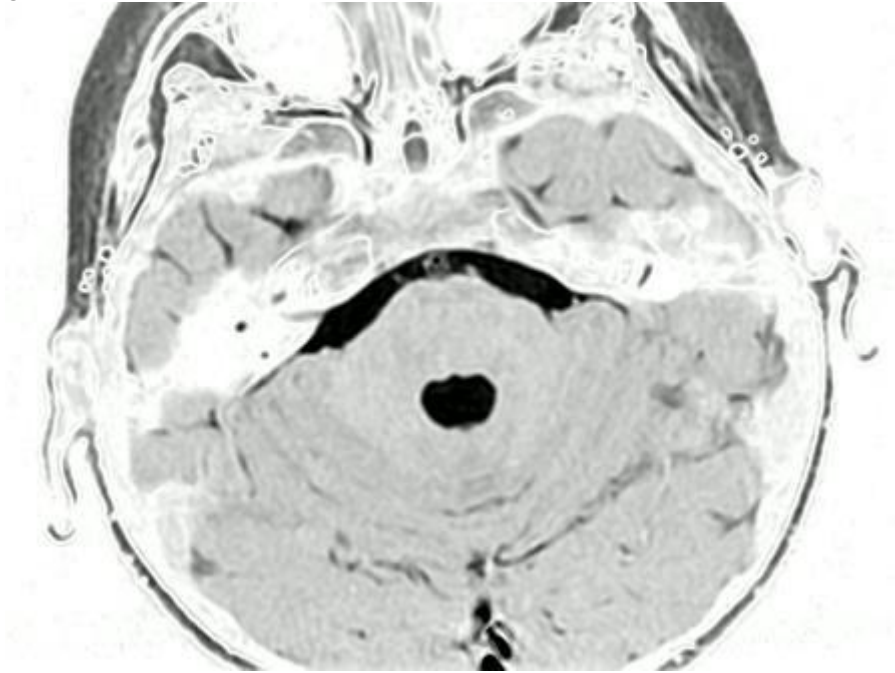
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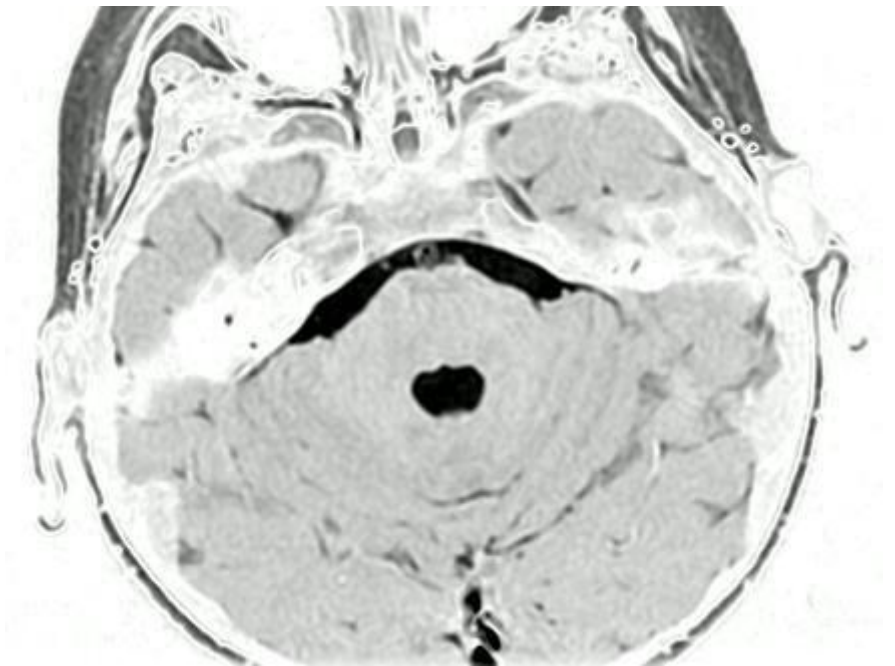
g



Description: Axial inversion image showing cisternal portion of right abducens nerve with absent left abducens nerve.

Flow void of anterior inferior cerebellar artery seen on left side. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

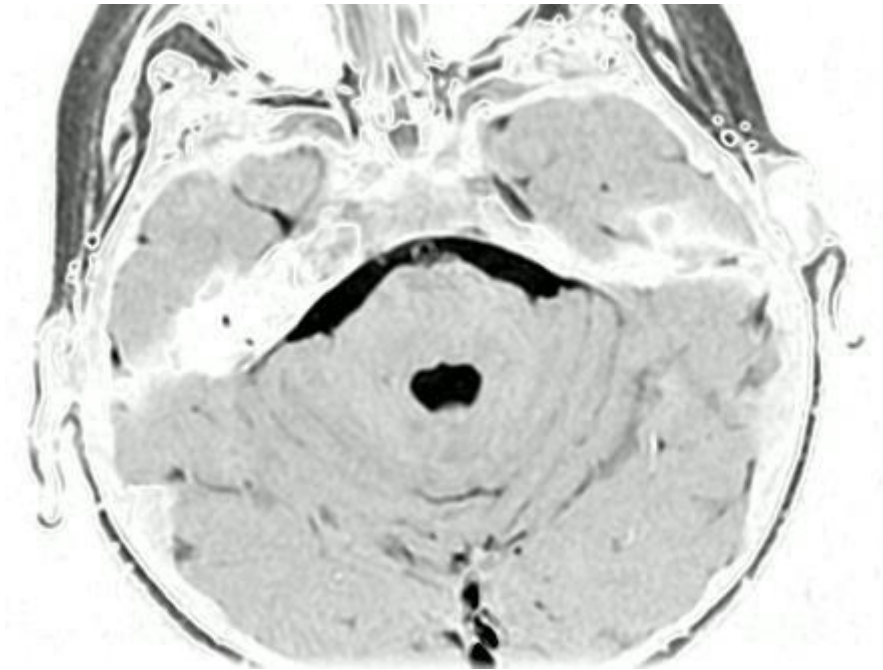
h



Description: Axial inversion image showing cisternal portion of right abducens nerve with absent left abducens nerve. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad.

MS, India.

i



Description: Axial inversion image showing cisternal portion of right abducens nerve entering in Dorello's canal with absent left abducens nerve. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

Figure 3

a



Description: Axial T2W fatsat images showing inferior part of lateral rectus muscles. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

b



Description: Axial T2W fatsat images showing normal calibre of lateral rectus muscles. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

c



Description: Axial T2W fatsat images showing normal calibre of lateral rectus muscles. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.

d



Description: Axial T2W fatsat images showing normal eye globes. **Origin:** Ahire P, Paras MRI Scan Centre and Dr. Hedgewar hospital, Aurangabad. MS, India.