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Teaching_NeuroImage: *ROBO3* Mutation Causing Horizontal Gaze Palsy and Brainstem Malformation

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Ramesh Konanki: Drafting/revision of the manuscript for content, including medical writing for content; Major role in the acquisition of data
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A 10-month-old boy presented with motor developmental delay, torticollis, bilateral abduction restriction (incomplete horizontal gaze palsy), and left lower motor neuron facial palsy. His brain MRI demonstrated brainstem malformations, including absent facial colliculi (Figure, A), clefting of the medulla and pons (Figure, B), butterfly configuration of the medulla (Figure, C), and concave dorsal pontine border (Figure, D). Genetic testing revealed a homozygous missense mutation [c.437G>C (p.Arg146Pro)] in exon 2 of ROBO3 gene. Horizontal gaze palsy with progressive scoliosis (HGPPS1) results from axonal guidance signalling defects caused by *ROBO3* mutations[1]. The main symptoms include congenital horizontal gaze palsy, horizontal pendular nystagmus, and progressive scoliosis after two years of age. The radiological differential for this hindbrain malformation is 'horizontal gaze palsy with progressive scoliosis-2', caused by mutation in the *DCC* gene[2]. Children with HGPPS2 also demonstrate intellectual impairment and agenesis of the corpus callosum[2].

http://links.lww.com/WNL/C576

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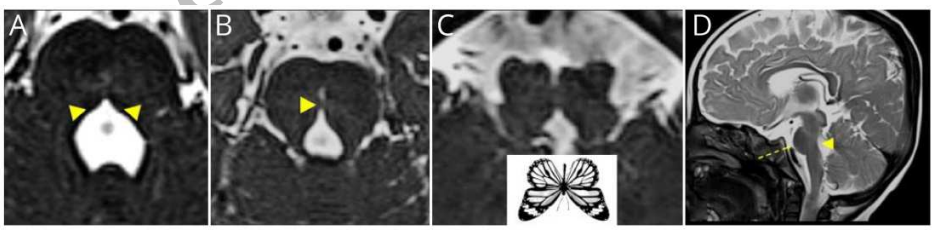
Figure- Imaging findings of ROBO3 mutation

Legend- Fig 1. High resolution heavily weighted T2 (CISS) axial images demonstrate (A) absent facial colliculi (arrowhead), (B) Dorsal pontine cleft generating the split pons sign (arrowhead), (C) Butterfly configuration of medulla. T2 sagittal image demonstrates (D) pontine hypoplasia (dashed arrow), concave dorsal pontine border (arrowhead), and normal corpus callosum.



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