28th Annual Scientific Meeting of Hong Kong College of Radiologists

Imaging the cranial nerves – with special emphasis on paediatric cranial nerve disorders

Dr Claudia Cheung, Dr Joyce Chan, Dr Kevin Fung, Dr Elaine Kan
Department of Radiology, Hong Kong Children's Hospital, Hong Kong SAR

Objective:

To demonstrate the radiological anatomy of cranial nerves (CNs) and the spectrum of disease entities affecting them, with special emphasis on congenital absence/hypoplasia as well as syndromic association in the paediatric population.

Materials and Methods:

Ten cases with cranial nerve pathologies were selected from electronic patient record, from year 2010-2020. Representative images from MRI examinations were chosen for illustration.

CN I – Kallmann Syndrome

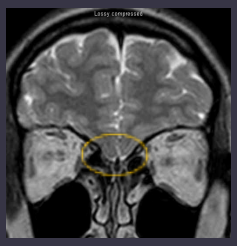


Fig 1a. MRI T2 Cor Absence of bilateral olfactory sulci and olfactory bulbs (O).

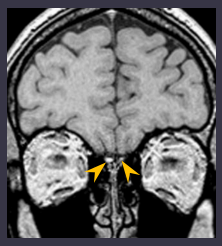


Figure 1b. Normal olfactory bulbs in another patient(➤).

CN II – Optic Nerve Glioma

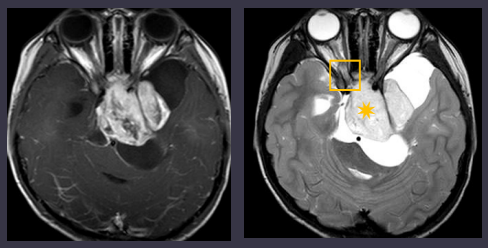


Fig 2. MRI T1 + C (Left) and T2 (Right) shows a large suprasellar mass with high T2 signal and enhancement. The pre-chiasmal optic nerve is infiltrated(□). Optic chiasm is replaced by the mass (✷).

CN III, IV, V – Epidermoid cyst at cavernous sinus

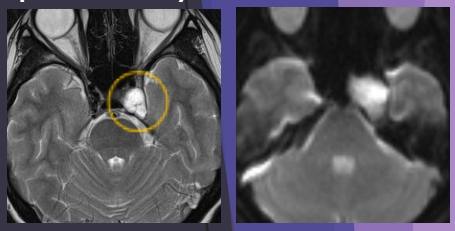


Fig 3. MRI T2 (Left), MRI DWI (Right) shows a T2 high signal lesion with restricted diffusion at left cavernous sinus(O).

CN III, IV, V – Tolosa Hunt Syndrome

Fig 4. MRI T1 FS + C coronal (Left) & axial (Right) shows an infiltrative enhancing mass involving the right cavernous sinus and orbital apex(➔).

CN V – Trigeminal Schwannoma

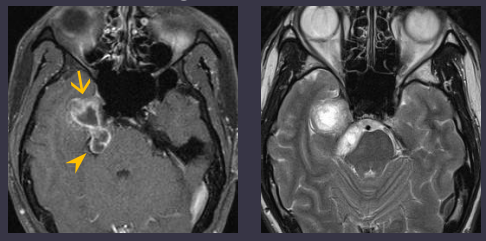


Fig 5. MRI T1 FS +C (Left) & T2 (Right) shows a T2 hyperintense mass with rim enhancement at the right pre-pontine cistern, around the origination of right trigeminal nerve(➤), extending into right Meckel's cave(➔) and projecting into the right temporal lobe.

CN VI - Duane Syndrome

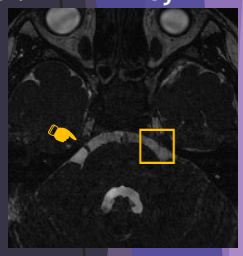


Fig 6. MRI T2 CISS shows absent cisternal segment of left abducens nerve (□); normal abducens nerve seen over the right (☛).

CN VII – Aberrant course of CN VII

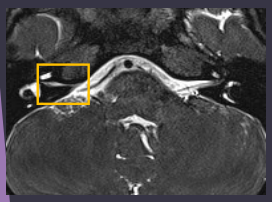
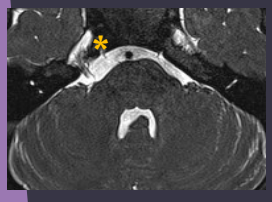


Fig 7. MRI T2 TRA

(Top) Stenotic right internal auditory meatus (□).



(Bottom) Aberrant right facial nerve travelling along side the trigeminal nerve towards right Meckel's cave (*).

CN VIII – Bilateral vestibular schwannoma in NF2

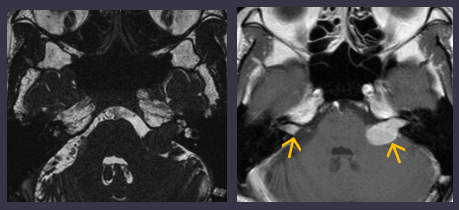


Fig 8. MRI T2 CISS (Left) & **T1 + C (Right)** shows enhancing masses within bilateral internal auditory canal, arising from the vestibulocochlear nerve (➔).

CN IX, X, XI – Jugular Foramen Tumour

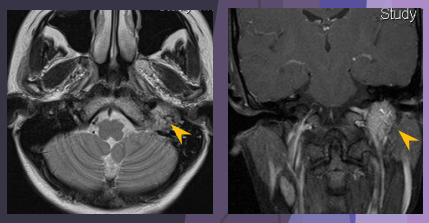


Fig 9. MRI T2 axial (Left) & T1 + C cor (Right) Paraganglioma in left jugular foramen (➤) showing contrast enhancement and flow voids in T2.

CN XII – Hypoglossal canal meningioma

Fig 10a. MRI T1 + C shows an enhancing lesion over left side of foramen magnum, at the location of left hypoglossal canal (➤).

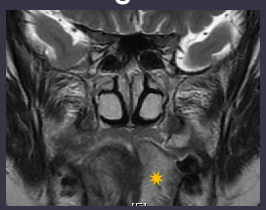


Fig 10b. MRI T2 shows denervation atrophy and deviation of left hemitongue with increased T2 signal (✷).

Conclusion :

Cranial nerves disorders can result from a wide spectrum of pathologies. Radiologists should be familiar with congenital anatomic absence/hypoplasia and CN disorders with syndromic association in the paediatric population. A good understanding of CN anatomy is crucial in recognition of CN pathologies and deriving a list of differential diagnoses.

香港兒童醫院
Hong Kong Children's Hospital