Posterior fossa cyst

see also Posterior fossa tumor.

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see also Cerebellar hemangioblastoma.

Cystic or cyst-like malformations of the posterior fossa represent a spectrum of disorders, including the Dandy-Walker malformation, cerebellar vermis hypoplasia, mega cisterna magna, and posterior fossa arachnoid cyst. Differentiation of these lesions may be difficult with routine cross-sectional imaging; however, an accurate diagnosis is essential for proper treatment planning and genetic counseling. Dandy-Walker malformation is easily diagnosed on the basis of the classic triad: complete or partial agenesis of the vermis, cystic dilatation of the fourth ventricle, and enlarged posterior fossa. Vermian-cerebellar hypoplasia is a general classification that describes congenital malformations with a normal-sized posterior fossa, varying degrees of vermian and cerebellar hypoplasia, and a prominent retrocerebellar cerebrospinal fluid space that communicates freely with a normal or dilated fourth ventricle. Mega cisterna magna can be asymmetric and can manifest apparent mass effect, simulating the appearance of an arachnoid cyst; therefore, ventriculography or cisternography may be needed to demonstrate communication of the cystic mass with the subarachnoid space. A careful review of the embryologic development is essential in understanding these malformations and in making a more accurate radiologic diagnosis [1)].

Posterior fossa intracranial cysts are usually divided into Dandy Walker malformations, posterior fossa arachnoid cysts, and isolated and/or trapped fourth ventricles.

Chiari I malformation can be due to a multitude of etiologies such as craniosynostosis or hydrocephalus. A posterior fossa extra-axial cyst (PFEAC) appears to be an extremely rare cause of this form of hindbrain herniation.

Khan et al. report a case of PFEAC that presented with no Chiari I malformation and then presented months later with a significant Chiari I malformation. Following shunt placement of a PFEAC, striking reversal of the Chiari malformation as well as reconstitution of the cerebellum was noted.

Patients with PFEAC might develop a Chiari I malformation and this might be treated with shunting of the PFEAC alone [2)].

In cases with the following neuroimaging findings, surgery appears to be indicated: (1) occipital bossing or petrosal scalloping with distortion or obliteration of cerebrospinal fluid (CSF) cisterns of the posterior fossa; (2) compression and deformity of the brain surrounding the cyst; (3) radioisotope and/or computed tomography cisternographic findings suggestive of disturbance of intracystic CSF circulation; (4) a non-communicating cyst [3)].

Differential diagnosis

Posterior fossa cyst differential diagnosis.

1)
Kollias SS, Ball WS Jr, Prenger EC. Cystic malformations of the posterior fossa: differential diagnosis clarified through embryologic analysis. Radiographics. 1993 Nov;13(6):1211-31. doi: 10.1148/radiographics.13.6.8031352. PMID: 8031352.
2)
Khan R, Oakes P, Tubbs RS, Oakes WJ. Development of profound Chiari I malformation and cerebellar tissue loss and resolution following shunting of posterior fossa extra-axial cyst. Case report. Childs Nerv Syst. 2017 Jan;33(1):183-185. doi: 10.1007/s00381-016-3182-3. PubMed PMID: 27444287.
3)
Arai H, Sato K. Posterior fossa cysts: clinical, neuroradiological and surgical features. Childs Nerv Syst. 1991 Jun;7(3):156-64. doi: 10.1007/BF00776713. PMID: 1878871.