Hydrocephalus after Vertebrobasilar Dolichoectasia

A 54-year-old man who presented with headache, ideomotor apraxia, and gait disorder. A head computed tomography (CT) scan showed a biventricular hydrocephalus and a subsequent CT angiography documented the presence of a VBDE compressing the anterior part of the third ventricle that also appeared hypoplastic. The patient also presented a clinical history of arterial hypertension for which he was given a proper pharmacologic treatment with symptom relief. A surgical treatment of ventriculoperitoneal shunt along with endoscopic septostomy was proposed, but the patient refused, probably due to the slightly positive response to medical treatment.

The natural clinical history of patients affected by VBDE is unfavorable with 7.8 years of median survival. The therapeutic strategy is usually conservative and the role of antiplatelets or oral anticoagulants is still debated. In selected patients, ventriculoperitoneal shunt to resolve intracranial hypertension caused by biventricular hydrocephalus is the most effective treatment. Chronic third ventricle compression could lead to anatomic-pathologic alterations like the third ventricle hypoplasia documented in this report. [1)].

2: Kinouchi T, Ishitani K, Uyama S, Miyamoto T, Fujimoto N, Ueta H. Basilar artery occlusion presenting as sudden bilateral deafness: a case report. J Med Case Rep. 2021 Mar 2;15(1):111. doi: 10.1186/s13256-020-02574-8. PMID: 33653404; PMCID: PMC7927263.

3: Prasad SN, Singh V, Selvamurugan V, Phadke RV. Vertebrobasilar dolichoectasia with typical radiological features. BMJ Case Rep. 2021 Feb 9;14(2):e239866. doi: 10.1136/bcr-2020-239866. PMID: 33563671; PMCID: PMC7875270.

4: Lee JM, Park JS, Koh EJ. Severe vertebrobasilar dolichoectasia as a cause of obstructive hydrocephalus: A case report. Medicine (Baltimore). 2019 May;98(21):e15752. doi: 10.1097/MD.0000000000015752. PMID: 31124959; PMCID: PMC6571214.

5: Oishi Y, Ueda R, Kuranari Y, Imanishi T. Vertebrobasilar Dolichoectasia Causing Symptomatic Hydrocephalus Due to Third Ventricular Compression. J Stroke Cerebrovasc Dis. 2018 Dec;27(12):3503-3504. doi: 10.1016/j.jstrokecerebrovasdis.2018.08.021. Epub 2018 Sep 23. PMID: 30257790.

6: Zhang DP, Peng YF, Ma QK, Zhao M, Zhang HL, Yin S. Why does my patient's basilar artery continue to grow? A four-year case study of a patient with symptoms of vertebrobasilar dolichoectasia. BMC Neurol. 2018 Apr 20;18(1):45. doi: 10.1186/s12883-018-1045-0. PMID: 29678166; PMCID: PMC5910553.

7: Mohammed K, Iqbal J, Kamel H, Mathew J, Al-Sulaiti G. Obstructive hydrocephalus and facial nerve palsy secondary to vertebrobasilar dolichoectasia: Case Report. Surg Neurol Int. 2018 Mar 7;9:60. doi: 10.4103/sni.sni_37_17. PMID: 29629227; PMCID: PMC5875110.

8: Ebrahimzadeh K, Bakhtevari MH, Shafizad M, Rezaei O. Hydrocephalus as a rare compilation of vertebrobasilar dolichoectasia: A case report and review of the literature. Surg Neurol Int. 2017 Oct 24;8:256. doi: 10.4103/sni.sni_162_17. PMID: 29184707; PMCID: PMC5680668.

9: Zdravković M, Kostov M, Petrovic S, Zdravkovic J. Dolichoectasia of Vertebrobasilar Arteries as a Cause of Hydrocephalus and Ischemic Cerebral Stroke. Am J Forensic Med Pathol. 2017 Dec;38(4):359-361. doi: 10.1097/PAF.0000000000000348. PMID: 28915130.

10: Jagetia A, Patel K, Sachdeva D, Rathore L. Dolichoectatic internal carotid artery presenting as a sellar-suprasellar mass with symptomatic hydrocephalus. Neurol India. 2017 May-Jun;65(3):681-682. doi: 10.4103/neuroindia.NI_533_16. PMID: 28488661.

11: Samim M, Goldstein A, Schindler J, Johnson MH. Multimodality Imaging of Vertebrobasilar Dolichoectasia: Clinical Presentations and Imaging Spectrum. Radiographics. 2016 Jul-Aug;36(4):1129-46. doi: 10.1148/rg.2016150032. Epub 2016 Jun 17. PMID: 27315445.

12: Obaid S, Magro E, Seizeur R, Bojanowski MW. A case of dorsolateral pontine infarct: Description of a new vascular alternating syndrome. Neurochirurgie. 2016 Apr;62(2):100-4. doi: 10.1016/j.neuchi.2015.09.002. Epub 2015 Dec 18. PMID: 26708133.

13: Zisimopoulou V, Ntouniadaki A, Aggelidakis P, Siatouni A, Gatzonis S, Tavernarakis A. Vertebrobasilar Dolichoectasia Induced Hydrocephalus: the Water- Hammer Effect. Clin Pract. 2015 May 27;5(2):749. doi: 10.4081/cp.2015.749. PMID: 26236456; PMCID: PMC4500878.

14: Yuan YJ, Xu K, Luo Q, Yu JL. Research progress on vertebrobasilar dolichoectasia. Int J Med Sci. 2014 Aug 2;11(10):1039-48. doi: 10.7150/ijms.8566. PMID: 25136259; PMCID: PMC4135226.

15: Kong Z, Liu Y, Jiang J, Fu B, Cheng X. [The clinical characteristics of patients with vertebrobasilar dolichoectasia]. Zhonghua Nei Ke Za Zhi. 2014 Jan;53(1):23-6. Chinese. PMID: 24674723.

16: Haisa T, Tsuda T, Hagiwara K, Kikuchi T, Seki K. Vertebrobasilar infarction related to giant cell (temporal) arteritis: case report. Neurol Med Chir (Tokyo). 2015;55(1):95-100. doi: 10.2176/nmc.cr.2013-0038. Epub 2013 Dec 27. PMID: 24390182; PMCID: PMC4533393.

17: Yuh SJ, Alkherayf F, Lesiuk H. Dolichoectasia of the vertebral basilar and internal carotid arteries: A case report and literature review. Surg Neurol Int. 2013 Nov 29;4:153. doi: 10.4103/2152-7806.122397. PMID: 24381796; PMCID: PMC3872646.

18: Tuzcu EA, Bayarogullari H, Coskun M, Yilmaz C, Ilhan N, Daglioglu MC, Aras M. Bilateral Abducens Paralysis Secondary to Compression of Abducens Nerve Roots by Vertebrobasilar Dolichoectasia. Neuroophthalmology. 2013 Nov 19;37(6):254-256. doi: 10.3109/01658107.2013.830136. PMID: 28167996; PMCID: PMC5291071.

19: Mishra VN, Chaurasia RN, Gupta S, Joshi D. Recurrent facial hemiparesis due to dolichoectatic vertebrobasilar artery: an unusual and ignored cause. BMJ Case Rep. 2013 Mar 15;2013:bcr2012008517. doi: 10.1136/bcr-2012-008517. PMID: 23505276; PMCID: PMC3618728.

20: Wolters FJ, Rinkel GJ, Vergouwen MD. Clinical course and treatment of vertebrobasilar dolichoectasia: a systematic review of the literature. Neurol Res. 2013 Mar;35(2):131-7. doi: 10.1179/1743132812Y.0000000149. PMID: 23452575.

21: Çelik Ö, Berkman ZM, Orakdöğen M, Ayan E, Somay H, Düzkalir HA. Obstructive hydrocephalus due to vertebrobasilar dolichoectasia: diagnostic and therapeutic considerations. J Neurol Surg A Cent Eur Neurosurg. 2013 Dec;74 Suppl 1:e4-8. doi: 10.1055/s-0032-1315792. Epub 2012 Aug 21. PMID: 22911556.

22: Kansal R, Mahore A, Dange N, Kukreja S. Dolichoectasia of vertebrobasilar arteries as a cause of hydrocephalus. J Neurosci Rural Pract. 2011 Jan;2(1):62-4. doi: 10.4103/0976-3147.80106. PMID: 21716844; PMCID: PMC3123011.

23: Ansari SA, Hunter JV, Nassif LM, Clark GD, Ramocki MB. Bilateral in utero cerebellar infarction. J Child Neurol. 2011 Jul;26(7):895-9. doi: 10.1177/0883073810393961. Epub 2011 Jan 24. PMID: 21266324; PMCID: PMC3128202.

24: Zhang ZY, Jiao JS, Xue S, Tian ZH, Liu ZJ. [Clinical characteristics and imaging analysis of vertebrobasilar dolichoectasia]. Zhonghua Yi Xue Za Zhi. 2010 Dec 21;90(47):3313-7. Chinese. PMID: 21223743.

25: Ikeda K, Nakamura Y, Hirayama T, Sekine T, Nagata R, Kano O, Kawabe K, Kiyozuka T, Tamura M, Iwasaki Y. Cardiovascular risk and neuroradiological profiles in asymptomatic vertebrobasilar dolichoectasia. Cerebrovasc Dis. 2010;30(1):23-8. doi: 10.1159/000313440. Epub 2010 Apr 27. PMID: 20424441.

26: Feng W, Caplan M, Matheus MG, Papamitsakis NI. Meningovascular syphilis with fatal vertebrobasilar occlusion. Am J Med Sci. 2009 Aug;338(2):169-71. doi: 10.1097/MAJ.0b013e3181a40b81. PMID: 19680027.

27: Siddiqui A, Chew NS, Miszkiel K. Vertebrobasilar dolichoectasia: a rare cause of obstructive hydrocephalus: case report. Br J Radiol. 2008 Apr;81(964):e123-6. doi: 10.1259/bjr/27603660. PMID: 18344271.

28: Passero SG, Rossi S. Natural history of vertebrobasilar dolichoectasia. Neurology. 2008 Jan 1;70(1):66-72. doi: 10.1212/01.wnl.0000286947.89193.f3. PMID: 18166708.

29: Yoshimura K, Kubo S, Nagashima M, Hasegawa H, Thminaga S, Yoshimine T. Occlusive hydrocephalus associated with cerebellar infarction treated with endoscopic third ventriculostomy: report of 5 cases. Minim Invasive Neurosurg. 2007 Oct;50(5):270-2. doi: 10.1055/s-2007-990293. PMID: 18058642.

30: Monge Argiles JA, Bautista Prados J, Ortega Ortega MD, Pérez Vicente JA, Morales Ortiz A. Megadolicobasilar, colitis ulcerosa e ictus isquémicos [Megadolicobasilar, ulcerative colitis and ischemic stroke]. Neurologia. 2003 May;18(4):221-4. Spanish. PMID: 12721869.

31: Weber MA, Steiner T, Fiebach J. Ungewöhnliche Ursache einer akuten Bewusstseinseintrübung. Dekompensierter Hydrozephalus bei Blockade der Foramina Monroi durch eine Megadolichobasilaris [Unusual cause of acute impairment of consciousness. Decompensated hydrocephalus caused by blockage of the foramini Monroi due to enlarged basilar artery]. Radiologe. 2002 Oct;42(10):833-6. German. doi: 10.1007/s00117-002-0744-z. PMID: 12524716.

32: Gómez PA, Campollo J, Lobato RD, Lagares A, Alén JF. Hemorragia subaracnoidea secundaria a aneurismas disecantes de la arteria vertebral. Descripción de 2 casos y revisión de la literatura [Subarachnoid hemorrhage secondary to dissecting aneurysms of the vertebral artery. Description of 2 cases and review of the literature]. Neurocirugia (Astur). 2001 Dec;12(6):499-508. Spanish. doi: 10.1016/s1130-1473(01)70665-3. PMID: 11787398.

33: Oya S, Tsutsumi K, Yonekura I, Inoue T. Infra-posterior inferior cerebellar artery aneurysm arising after occlusion of the ipsilateral vertebral artery– case report. Neurol Med Chir (Tokyo). 2001 Nov;41(11):545-7. doi: 10.2176/nmc.41.545. PMID: 11758707.

34: Carpentier A, Brunelle F, Philippon J, Clemenceau S. Obstruction of Magendie's and Luschka's foramina. Cine-MRI, aetiology and pathogenesis. Acta Neurochir (Wien). 2001;143(5):517-21; discussion 521-2. doi: 10.1007/s007010170083. PMID: 11482704.

35: Ricci G, Lenzi J, Esposito V. Hydrocephalus caused by dolichoectatic basilar artery. Case report. J Neurosurg Sci. 2000 Sep;44(3):155-8. PMID: 11126452.

36: Bidziński J, Michalik R. Postacie kliniczne zespołu Arnolda-Chiari [Clinical patterns of Arnold-Chiari malformations]. Neurol Neurochir Pol. 1998 Sep- Oct;32(5):1181-8. Polish. PMID: 10463231.

37: Sekhar LN, Schessel DA, Bucur SD, Raso JL, Wright DC. Partial labyrinthectomy petrous apicectomy approach to neoplastic and vascular lesions of the petroclival area. Neurosurgery. 1999 Mar;44(3):537-50; discussion 550-2. doi: 10.1097/00006123-199903000-00060. PMID: 10069591.

38: Passero S, Filosomi G. Posterior circulation infarcts in patients with vertebrobasilar dolichoectasia. Stroke. 1998 Mar;29(3):653-9. doi: 10.1161/01.str.29.3.653. PMID: 9506608.

39: Kirsch E, Hausmann O, Kaim A, Gratzl O, Steinbrich W, Radü EW. Magnetic resonance imaging of vertebrobasilar ectasia in trigeminal neuralgia. Acta Neurochir (Wien). 1996;138(11):1295-8; discussion 1299. doi: 10.1007/BF01411058. PMID: 8980732.

40: Besson G, Bogousslavsky J, Moulin T, Hommel M. Vertebrobasilar infarcts in patients with dolichoectatic basilar artery. Acta Neurol Scand. 1995 Jan;91(1):37-42. doi: 10.1111/j.1600-0404.1995.tb05840.x. PMID: 7732772.

41: Anson JA, Spetzler RF. Endarterectomy of the intradural vertebral artery via the far lateral approach. Neurosurgery. 1993 Nov;33(5):804-10; discussion 810-1. doi: 10.1227/00006123-199311000-00003. PMID: 8264876.

42: Kase CS, Norrving B, Levine SR, Babikian VL, Chodosh EH, Wolf PA, Welch KM. cerebellar infarction. Clinical and anatomic observations in 66 cases. Stroke. 1993 Jan;24(1):76-83. doi: 10.1161/01.str.24.1.76. PMID: 8418555.

43: Hernesniemi J, Vapalahti M, Niskanen M, Kari A. Management outcome for vertebrobasilar artery aneurysms by early surgery. Neurosurgery. 1992 Nov;31(5):857-61; discussion 861-2. doi: 10.1227/00006123-199211000-00005. PMID: 1279451.

44: Rautenberg W, Aulich A, Röther J, Wentz KU, Hennerici M. Stroke and dolichoectatic intracranial arteries. Neurol Res. 1992;14(2 Suppl):201-3. doi: 10.1080/01616412.1992.11740052. PMID: 1355889.

45: Milandre L, Bonnefoi B, Pestre P, Pellissier JF, Grisoli F, Khalil R. Dolichoectasies artérielles vertébrobasilaires. Complications et pronostic [Vertebrobasilar arterial dolichoectasia. Complications and prognosis]. Rev Neurol (Paris). 1991;147(11):714-22. French. PMID: 1775825.

46: Giang DW, Perlin SJ, Monajati A, Kido DJ, Hollander J. Vertebrobasilar dolichoectasia: assessment using MR. Neuroradiology. 1988;30(6):518-23. doi: 10.1007/BF00339693. PMID: 3226539.

47: Brill CB, Peyster RG, Keller MS, Galtman L. Isolation of the right subclavian artery with subclavian steal in a child with Klippel-Feil anomaly: an example of the subclavian artery supply disruption sequence. Am J Med Genet. 1987 Apr;26(4):933-40. doi: 10.1002/ajmg.1320260424. PMID: 3591838.

48: Nishizaki T, Tamaki N, Takeda N, Shirakuni T, Kondoh T, Matsumoto S. Dolichoectatic basilar artery: a review of 23 cases. Stroke. 1986 Nov- Dec;17(6):1277-81. doi: 10.1161/01.str.17.6.1277. PMID: 3810731.

49: Rapoport S. The management of drop attacks. Dis Mon. 1986 Mar;32(3):121-62. doi: 10.1016/s0011-5029(86)80005-0. PMID: 3007059.

50: van Alphen HA. Migraine, a result of increased CSF pressure: a new pathophysiological concept (preliminary report). Neurosurg Rev. 1986;9(1-2):121-4. doi: 10.1007/BF01743062. PMID: 3736895.

51: Smoker WR, Corbett JJ, Gentry LR, Keyes WD, Price MJ, McKusker S. High- resolution computed tomography of the basilar artery: 2. Vertebrobasilar dolichoectasia: clinical-pathologic correlation and review. AJNR Am J Neuroradiol. 1986 Jan-Feb;7(1):61-72. PMID: 3082145.

52: Cioffi FA, Bernini FP, Punzo A, D'Avanzo R. Surgical management of acute cerebellar infarction. Acta Neurochir (Wien). 1985;74(3-4):105-12. doi: 10.1007/BF01418797. PMID: 3984789.

53: Heidrich R, Schmeisser G, Siegmund R. Zur Differentialdiagnose des akinetischen Mutismus [Differential diagnosis of akinetic mutism]. Psychiatr Neurol Med Psychol (Leipz). 1984 Aug;36(8):458-63. German. PMID: 6494340.

54: Price J, Whitlock FA, Hall RT. The psychiatry of vertebro-basilar insufficiency with the report of a case. Psychiatr Clin (Basel). 1983;16(1):26-44. doi: 10.1159/000283948. PMID: 6844659.

55: Derlon JM, Charbonneau P, Théron J, Houtteville JP, Bazin C. Ramollissements cedémateux du cervelet du sujet jeune [Edematous cerebellar infarction in the young subject]. Neurochirurgie. 1983;29(6):423-8. French. PMID: 6664405.

56: Harbaugh RE, Saunders RL, Reeves AG. Pediatric cerebellar infarction: case report and review of the literature. Neurosurgery. 1982 May;10(5):593-6. doi: 10.1227/00006123-198205000-00008. PMID: 7099410.

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Umana GE, Alberio N, Graziano F, Fricia M, Tomasi SO, Corbino L, Nicoletti GF, Cicero S, Scalia G. Vertebrobasilar Dolichoectasia, Hypoplastic Third Ventricle, and Related Biventricular Hydrocephalus: Case Report and Review of the Literature. J Neurol Surg A Cent Eur Neurosurg. 2021 Jun 2. doi: 10.1055/s-0041-1725049. Epub ahead of print. PMID: 34077981.