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İÇİNDEKİLER

BÖLÜM 1 KRANİAL TRAVMA

Mustafa HIZAL[1]

Vaka 1: Kalvaryal kırık

Vaka 2: Travmatik epidural hematom ve kalvaryal kırık

Vaka 3: Travmatik subdural hematom ve difüz aksonal hasar

Vaka 4: Subaraknoid ve subdural kanama ve kalvarial kırık

Vaka 5: Travmatik serebral kontüzyon

Vaka 6: Parankimal ve subdural hematom, subaraknoid kanama

Vaka 7: Difüz Aksonal Hasar

Vaka 8: Düşük hızlı penetran kafa travması

Vaka 9: Dural sinüs trombozu, serebellar venöz enfarkt, parankimal hematom

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KAYNAKÇA

1. Piteau SJ, Ward MG, Barrowman NJ, Plint AC. Clinical and radiographic characteristics associated with abusive and nonabusive head trauma: a systematic review. *Pediatrics.* 2012;130(2): 315-323. https://doi.org/10.1542/peds.2011-1545.
2. Muñoz-Sánchez MA, Murillo-Cabezas F, Cayuela-Domínguez A, Rincón-Ferrari MD, Amaya-Villar R, León-Carrión J. Skull fracture, with or without clinical signs, in mTBI is an independent risk marker for neurosurgically relevant intracranial lesion: a cohort study. *Brain Inj.* 2009;23(1): 39-44. https://doi.org/10.1080/02699050802590346.
3. Zulfiqar M, Kim S, Lai JP, Zhou Y. The role of computed tomography in following up pediatric skull fractures. *Am J Surg.* 2017;214(3): 483-488. https://doi.org/10.1016/j.amjsurg.2016.07.020.
4. Miki S, Fujita K, Katayama W, Sato M, Kamezaki T, Matsumura A, Sakashita S. Encapsulated acute subdural hematoma mimicking acute epidural hematoma on computed tomography. *Neurol Med Chir (Tokyo).* 2012;52(11): 826-828. https://doi.org/10.2176/nmc.52.826.
5. Maxwell WL. Traumatic brain injury in the neonate, child and adolescent human: an overview of pathology." *Int J Dev Neurosci.* 2012;30(3): 167-183. https://doi.org/10.1016/j.ijdevneu.2011.12.008.
6. Gean AD, Fischbein NJ, Purcell DD, Aiken AH, Manley GT, Stiver SI. Benign anterior temporal epidural hematoma: indolent lesion with a characteristic CT imaging appearance after blunt head trauma. *Radiology.* 2012;257(1): 212-218. https://doi.org/10.1148/radiol.10092075.
7. De Souza M, Moncure M, Lansford T, Albaugh G, Tarnoff M, Goodman M, Endress R, Ross SE. Nonoperative management of epidural hematomas and subdural hematomas: is it safe in lesions measuring one centimeter or less? *J Trauma.* 2007;63(2): 370-372. https://doi.org/10.1097/TA.0b013e318124a95b.
8. Monea AG, Baeck K, Verbeken E, Verpoest I, Sloten JV, Goffin J, Depreitere B. The biomechanical behaviour of the bridging vein-superior sagittal sinus complex with implications for the mechanopathology of acute subdural haematoma. *J Mech Behav Biomed Mater.* 2014;32: 155-165. https://doi.org/10.1016/j.jmbbm.2013.12.007.
9. Sawauchi S, Abe T. The effect of haematoma, brain injury, and secondary insult on brain swelling in traumatic acute subdural haemorrhage. *Acta Neurochir (Wien).* 2008;150(6): 531-536. https://doi.org/10.1007/s00701-007-1497-2.
10. Smith WP Jr, Batnitzky S, Rengachary SS. Acute isodense subdural hematomas: a problem in anemic patients. *AJR Am J Roentgenol.* 1981;136(3): 543-546. https://doi.org/10.2214/ajr.136.3.543.
11. Kim KH. Predictors for functional recovery and mortality of surgically treated traumatic acute subdural hematomas in 256 patients. *J Korean Neurosurg Soc.* 2009;45(3): 143-150. https://doi.org/10.3340/jkns.2009.45.3.143.
12. Servadei F, Picetti E. Traumatic subarachnoid hemorrhage. *World Neurosurgery.* 2014;82(5): 597-598. https://doi.org/10.1016/j.wneu.2014.08.034
13. Yuh EL, Mukherjee P, Lingsma HF, Yue JK, Ferguson AR, Gordon WA, Valadka AB, Schnyer DM, Okonkwo DO, Maas AI, Manley GT; TRACK-TBI Investigators. Magnetic resonance imaging improves 3-month outcome prediction in mild traumatic brain injury. *Annals of Neurology.* 2013;73(2): 224-235. https://doi.org/10.1002/ana.23783
14. Aquino C, Woolen S, Steenburg SD. Magnetic resonance imaging of traumatic brain injury: a pictorial review. *Emergency Radiology.* 2015;22(1): 65-78. https://doi.org/ 10.1007/s10140-014-1226-0.
15. Iaccarino C, Schiavi P, Picetti E, Goldoni M, Cerasti D, Caspani M, Servadei F. Patients with brain contusions: predictors of outcome and relationship between radiological and clinical evolution. *Journal of Neurosurgery.* 2014;120(4): 908-918. https://doi.org/10.3171/2013.12.JNS131090.
16. DeQuesada IM 2nd, Chokshi FH. Neuroimaging of acute traumatic brain injury: emphasis on magnetic resonance imaging and prognostic factors. *Seminars in Roentgenology.* 2014;49(1): 64-75. https://doi.org/10.1053/j.ro.2013.10.003.
17. Mechtler LL, Shastri KK, Crutchfield KE. "Advanced neuroimaging of mild traumatic brain injury. *Neurologic Clinics.* 2014;32(1): 31-58. https://doi.org/10.1016/j.ncl.2013.08.002.
18. Liu J, Kou Z, Tian Y. Diffuse axonal injury after traumatic cerebral microbleeds: an evaluation of imaging techniques. *Neural Regeneration Research.* 2014;9(12): 1222-1230. https://doi.org/10.4103/1673-5374.135330.
19. Perez AM, Adler J, Kulkarni N, Strain JF, Womack KB, Diaz-Arrastia R, Marquez de la Plata CD. Longitudinal white matter changes after traumatic axonal injury. *Journal of Neurotrauma.* 2014;31(17): 1478-1485. https://doi.org/10.1089/neu.2013.3216.
20. Kazim SF, Shamim MS, Tahir MZ, Enam SA, Waheed S. Management of penetrating brain injury. *Journal of Emergencies, Trauma, and Shock.* 2011;4(3): 395-402. https://doi.org/10.4103/0974-2700.83871.
21. Grossbach AJ, Abel TJ, Smietana J, Dahdaleh N, Severson MA 3rd, Hasan D. Impalement brain injury from

steel rod causing injury to jugular bulb: case report and review of the literature. *Brain Injury.* 2014;28(12): 1617-1621. https://doi.org/10.3109/02699052.2014.934284.

22. Syrmos N, Ganau M, De Carlo A, Prisco L, Ganau L, Valadakis V, Grigoriou K, Iliadis C, Arvanitakis D. Dealing with the surgical and medical challenges of penetrating brain injuries. *Case Reports in Surgery.* 2013;2013: 209750. https://doi.org/10.1155/2013/209750.
23. Benifla M, Yoel U, Melamed I, Merkin V, Cohen A, Shelef I. Dural sinus obstruction following head injury: a diagnostic and clinical study. *Journal of Neurosurgery.* 2016;18(3): 253-262. https://doi.org/10.3171/2016.3.PEDS15690.
24. Dalgiç A, Seçer M, Ergüngör F, Okay O, Akdağ R, Ciliz D. Dural sinus thrombosis following head injury: report of two cases and review of the literature. *Turkish Neurosurgery.* 2008;18(1): 70-77.
25. Afshari FT, Yakoub KM, Zisakis A, Thomas A, Ughratdar I, Sturman S, Belli A. "Traumatic dural venous sinus thrombosis; a challenge in management of head injury patients. *Journal of Clinical Neuroscience.* 2018;18: 169-173. https://doi.org/10.1016/j.jocn.2018.08.047.

BÖLÜM 2

KONJENİTAL SEREBRAL MALFORMASYONLAR

Elif GÖZGEÇ1

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- McRae hattı: Foramen magnumun anterior hattının orta noktası (basion) ile posterior hattının orta noktasını (opistion) birleştiren çizgidir. Normalde odontoid proçes bu hattın altında kalır.
- Chamberlain hattı: Sert damak arka kenarından opistiona çizilen hattır. Odontoid proçesin bu hattı 5 mm'den fazla geçmesi tanı koydurur.
- McGregor hattı: Sert damak arka kenarından oksipital kemik en alt noktasına çizilen hattır. Odontoid proçesin bu hattı 7 mm'den fazla geçmesi tanı koydurur (20-22).

Tuzaklar

Platibazi kafatası tabanının anormal düzleşmesidir. Beraberinde baziler invajinasyon yoksa asemptomatiktir (3).

Tedavi ve Yaklaşım

Semptomatik olanlarda cerrahi tedavi uygulanır.

KAYNAKLAR

1. S. E. Byrd. Magnetic resonance imaging of supratentorial congenital brain malformations. *J Natl Med Assoc*. 1989;81: 873–881.
2. Tuncel E, Yazıcı Z. *Çocuk hastalıklarında radyolojik bulgular*. Nobel&Güneş. 2002.
3. Barkovich AJ. *Pediatric neuroimaging*, 3rd edition. Philadelphia: Lippincott Williams & Wilkins, 2000;p. 251-381.
4. Osborn AG, Blaser SI, Salzman KL, et al. *Diagnostic Imaging: Brain*, 1st ed. Elsevier LTD. Oxford. 2004;p. 1-74.
5. Aiken AH, Hoots JA, Saindane AM, et al. Incidence of cerebellar tonsillar ectopia in idiopathic intracranial hypertension: a mimic of the Chiari I malformation. *AJNR Am J Neuroradiol*. 2012;33 (10): 1901-1906. doi:10.3174/ajnr.A3068
6. El gammal T, Mark EK, Brooks BS. MR imaging of Chiari II malformation. *AJR Am J Roentgenol*. 1988;150 (1): 163-170.
7. Naidich TP, Mclone DG, Fulling KH. The chiari II malformation: part IV. The hindbrain deformity. *Neuroradiology* 1990;11:665-674.
8. Piper RJ, Pike M, Harrington R, et al. Chiari malformations: principles of diagnosis and management. *BMJ*. 2019;365:l1159. doi: 10.1136/bmj.l1159
9. Wolpert SM, Anderson M, Scott RM, et al. The Chiari II malformation MR imaging evaluation. *AJNR Am J Neuroradiol* 1987;8:783-791.
10. Babyn PS. Teaching *Atlas of Pediatric Imaging*. New York: Thieme Medical Publishers. 2006;p. 48-53.
11. Byrd SE, Osborn RE, Radkowski MA, et al. Disorders of the midline structures: holoprosencephaly, absence of corpus callosum, an Chiari malformations. *Semin Ultrasound CT MR*. 1988;9:201-205.
12. Bosemani T, Orman G, Boltshauser E et-al. Congenital abnormalities of the posterior fossa. *Radiographics*. 2015;35:200-220. doi:10.1148/rg.351140038
13. Ossenbach RK, Menezes AH. Diagnosis and management of the Dandy-Walker malformation. *Pediatr Neurosurg*1992;18:179-189.
14. Barkovich AJ. *Pediatric neuroimaging*, 3rd edition. Philadelphia: Lippincott Williams & Wilkins, 2000;p. 592-595.
15. Logan C, Asadi H, Kok HK, et al. Arachnoid Cysts - Common and Uncommon Clinical Presentations and Radiological Features. *J Neuroimaging Psychiatry Neurol.* 2016;1(2): 79-84.
16. Oh KY, Kennedy AM, Frias AE Jr, et al. Fetal schizencephaly: pre- and postnatal imaging with a review of the clinical manifestations. *Radiographics*. 2005;25(3):647-657.

17. Ghai S, Fong KW, Toi A, et al. Prenatal US and MR imaging findings of lissencephaly: review of fetal cerebral sulcal development. *Radiographics*. 2006;26(2):389-405.
18. Gebarski SS, Gebarski KS, Bowerman RA et-al. Agenesis of the corpus callosum: sonographic features. *Radiology*. 1984;151 (2): 443-448.
19. Ho ML, Moonis G, Ginat DT, et al. Lesions of the Corpus Callosum. *AJR Am J Roentgenol*. 2013;200(1):1-16. doi: 10.2214/AJR.11.8080
20. Smoker WR. Craniovertebral junction: normal anatomy, craniometry, and congenital anomalies. *Radiographics*. 1994;14 (2): 255-277. doi:10.1148/radiographics.14.2.8190952
21. Jain N, Verma R, Garga UC, et al. CT and MR imaging of odontoid abnormalities: A pictorial review. *Indian J Radiol Imaging*. 2016;26(1):108-119. doi: 10.4103/0971-3026.178358.
22. Dolan K. Cervicobasilar relationships. *Radiol Clin North Am* 1977;15:155-166.

BÖLÜM 3

NÖROKUTANÖZ SENDROMLAR

İlyas DÜNDAR[1]

Vaka 1: Nörofibromatozis Tip 1 (Beyin Tutulumu + Nörofibromlar)

Vaka 2: Nörofibromatozis Tip 1 (Beyin Tutulumu) + Ewing Sarkom

Vaka 3: Nörofibromatozis Tip 2 (Menenjiom + Sağ Vestibüler Schwannom + Optik Gliom)

Vaka 4: Tüberoskleroz (Beyin Tutulumu)

Vaka 5: Tüberoskleroz (Beyin Tutulumu) + Pankreas Orta Dereceli Nöroendokrin Tümör (Distal Pankreotektomi)

Vaka 6: Sturge-Weber Sendromu

Vaka 7: Sturge Weber Sendromu

Vaka 8: Von Hippel-Lindau Sendromu (Hemanjioblastom + Pankreatik Kist + Sol Böbrek RCC)

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Tuzaklar

MRG'de kistik lezyon ve kontrast tutan mural nodül ile tanınan serebellar hemanjiyoblastom VHL sendromuna eşlik edebildiği gibi sporadik de olabilir. Bu yüzden serebellar hemanjiyoblastom tanısı konan hastalarda diğer sistemlerin de taranması gerekir.

Tedavi ve yaklaşım

Kraniyospinal lezyonlar cerrahi olarak güvenli bir şekilde rezeke edilir ve sıklıkla küratiftir. SSS hemanjiyoblastomları farklı bölgelerde ve farklı zamanlarda büyüyebildiğinden, hastalar semptomatik olana kadar cerrahi yaklaşım yapılmaz. Asemptomatik lezyonlar yıllık görüntüleme ile izlenir. Büyük boyutlu tümörlerde tümör vaskülaritesini kontrol etmek için ameliyat öncesi arteriyel embolizasyon yapılmalıdır (22). Postoperatif dönemde SSS MRG ile yakın takip edilmeli ve diğer sistemler de tutulum açısından araştırılmalıdır.

Anahtar Kelimeler

nörokütanöz sendrom, nörofibromatozis, von recklinghausen hastalığı, cafe´ la lait lekeleri, legius sendromu, optik yol gliomları, nörofibrom, pleksiform nörofibrom, iris hamartomu, lisch nodülleri, tanımlanamayan parlak objeler, fokal sinyal alanları, vestibüler schwannom, menenjiom, ependimom, tüberoskleroz, bourneville hastalığı, kortikal tüber, subependimal nodül, subependimal dev hücreli astrositom, nöroendokrin tümör, sturge-weber sendromu, ensefalotrigeminal anjiyomatozis, serebral hemiatrofi, giral kalsifikasyonlar, oksipital kalsifikasyon, epilepsi, porto-şarap lekesi, leptomeningeal anjiyom, kalvaryal hipertrofi, CEC sendromu, PHACE sendromu, von hippel-lindau sendromu, serebellar hemanjiyoblastom, mural nodül, feokromositoma, paraganglioma, pankreatik kist, renal hücreli karsinom, MRG, BT

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1. Brems H, Chmara M, Sahbatou M, et al. Germline loss-of-function mutations in SPRED1 cause a neurofibromatosis 1–like phenotype. *Nat Genet.* 2007;39(9): 1120-1126. DOI:10.1038/ng2113
2. Basile U, Cavallaro G, Polistena A, et al. Gastrointestinal and retroperitoneal manifestations of type 1 neurofibromatosis. *J Gastrointest Surg.* 2010;14(1): 186-194. DOI:10.1007/s11605-009-0940-5
3. Gutmann DH, Aylsworth A, Carey JC, et al. The diagnostic evaluation and multidisciplinary management of neurofibromatosis 1 and neurofibromatosis 2. *Jama.* 1997;278(1): 51-57. DOI:10.1001/jama.1997.03550010065042
4. Bognanno JR, Edwards MK, Lee TA, at al. Cranial MR imaging in neurofibromatosis. *AJR Am J Roentgenol.* 1988;151(2): 381–388. DOI:10.2214/ajr.151.2.381
5. Levy AD, Patel N, Dow N, at al. Abdominal neoplasms in patients with neurofibromatosis type 1: radiologic-pathologic correlation. *Radiographics.* 2005;25(2): 455-480. DOI:10.1148/rg.252045176
6. Ullrich NJ. Neurocutaneous syndromes and brain tumors. *J Child Neurol.* 2016;31(12): 1399-1411.

DOI:10.1177/0883073815604220
7. Evans DGR. Neurofibromatosis 2 [Bilateral acoustic neurofibromatosis, central neurofibromatosis, NF2, neurofibromatosis type II]. *Genet Med.* 2009;11(9): 599-610. DOI:10.1097/GIM.0b013e3181ac9a27
8. Mautner V-F, Nguyen R, Kutta H, et al. Bevacizumab induces regression of vestibular schwannomas in patients with neurofibromatosis type 2. *Neuro-oncology.* 2010;12(1): 14-18. DOI:10.1093/neuonc/nop010
9. Curatolo P, Maria BL. Tuberous sclerosis. *Handb Clin Neurol*. Elsevier;2013: 323-331. DOI:10.1016/B978-0-444-52891-9.00038-5
10. DiPaolo D, Zimmerman RA. Solitary cortical tubers. *AJNR Am J Neuroradiol.* 1995;16(6): 1360-1364.
11. Larson A, Hedgire S, Deshpande V, et al. Pancreatic neuroendocrine tumors in patients with tuberous sclerosis complex. *Clin Genet.* 2012;82(6): 558-563. DOI:10.1111/j.1399-0004.2011.01805.x
12. Krishnan A, Kaza RK, Vummidi DR. Cross-sectional Imaging Review of Tuberous Sclerosis. *Radiol Clin North Am*. 2016;54(3):423-440.
13. Gobbi G. Coeliac disease, epilepsy and cerebral calcifications. *Brain Dev.* 2005;27(3): 189-200. DOI:10.1016/j.braindev.2004.05.003
14. Drolet BA, Dohil M, Golomb MR, et al. Early stroke and cerebral vasculopathy in children with facial hemangiomas and PHACE association. *Pediatrics.* 2006;117(3): 959-964. DOI:10.1542/peds.2005-1683
15. Comi AM. Update on Sturge–Weber syndrome: diagnosis, treatment, quantitative measures, and controversies. *Lymphat Res Biol.* 2007;5(4):257-64. DOI:10.1089/lrb.2007.1016
16. Bebin EM, Gomez MR. Prognosis in Sturge-Weber disease: comparison of unihemispheric and bihemispheric involvement. *J Child Neurol.* 1988;3(3): 181-184. DOI:10.1177/088307388800300306
17. Ayas ZÖ, Asil K, Öcal R. The clinico-radiological spectrum of Dyke-Davidoff-Masson syndrome in adults. *Neurol Sci.* 2017;38(10): 1823-1828. DOI:10.1007/s10072-017-3074-7
18. Rasmussen T, Olszewski J, Lloydsmith D. Focal seizures due to chronic localized encephalitis. *Neurology.* 1958;8(6): 435-445. DOI:10.1212/01.wnl.0000398013.26242.03
19. Choyke PL, Glenn GM, Walther M, at al. von Hippel-Lindau disease: genetic, clinical, and imaging features. *Radiology.* 1995;194(3): 629-642. DOI:10.1148/radiology.194.3.7862955
20. Poulsen MLM, Budtz″Jørgensen E, Bisgaard M. Surveillance in von Hippel″Lindau disease (VHL). *Clin Genet.* 2010;77(1): 49-59. DOI:10.1111/j.1399-0004.2009.01281.x
21. Ho VB, Smirniotopoulos JG, Murphy FM, at al. Radiologic-pathologic correlation: hemangioblastoma. *AJNR Am J Neuroradiol.* 1992;13(5):1343-52.
22. Lonser RR, Butman JA, Huntoon K, et al. Prospective natural history study of central nervous system hemangioblastomas in von Hippel-Lindau disease. *J Neurosurg.* 2014;120(5): 1055-62. DOI:10.3171/2014.1.JNS131431

BÖLÜM 4

VASKÜLER OKLÜZİV HASTALIKLAR

Fatih KILINÇ[1]

Vaka 1: Akut iskemik inme, MCA oklüzyonu

Vaka 2: Baziler arter oklüzyonu, vertebrobaziler inme

Vaka 3: Ekstrakranial ICA darlığı, hemodinamik enfarkt

Vaka 4: SAK sonrası vazospazm ve serebral iskemi

Vaka 5: Serebral venöz trombüs

Vaka 6: Santral sinir sistemi vasküliti

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Tuzaklar

Görüntüleme yöntemleri vaskülit tanısını destekler ancak kesin tanı koydurmaz.

Tedavi ve yaklaşım

Tedavide yüksek doz kortikosteroid ve gereklilik halinde immünsüpresif ilaçlar kullanılır.

Anahtar Kelimeler

Akut iskemik inme, vertebrobaziler inme, penumbra, iskemik kor, borderzone enfarkt, NIHSS, ASPECTS, vazospazm, gecikmiş serebral iskemi, MCA oklüzyonu, dens MCA, baziler arter oklüzyonu, serebral venöz tromboz, empty delta işareti, semptomatik ICA darlığı, bilateral talamik ödem, NASCET, trombolitik, trombektomi, IV tPA, vaskülit

KAYNAKÇA

1. Feigin VL, Lawes CM, Bennett DA, et al. Stroke epidemiology: a review of population-based studies of incidence, prevalence, and case-fatality in the late 20th century. *Lancet Neurol*. 2003;2(1):43-53. doi:10.1016/s1474-4422(03)00266-7
2. Potter CA, Vagal AS, Goyal M, et al. CT for Treatment Selection in Acute Ischemic Stroke: A Code Stroke Primer. *Radiographics*. 2019;39(6):1717-1738. doi:10.1148/rg.2019190142
3. Ramos-Cabrer P, Campos F, Sobrino T, et al. Targeting the ischemic penumbra. *Stroke*. 2011;42(1 Suppl):S7-S11. doi:10.1161/STROKEAHA.110.596684
4. Srinivasan A, Goyal M, Al Azri F, et al. State-of-the-art imaging of acute stroke. *Radiographics*. 2006;26 Suppl 1:S75-S95. doi:10.1148/rg.26si065501
5. Albers GW, Marks MP, Kemp S, et al. Thrombectomy for Stroke at 6 to 16 Hours with Selection by Perfusion Imaging. *N Engl J Med*. 2018;378(8):708-718. doi:10.1056/NEJMoa1713973
6. Powers WJ, Rabinstein AA, Ackerson T, et al. 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association [published correction appears in Stroke. 2018 Mar;49(3):e138] [published correction appears in Stroke. 2018 Apr 18;:]. *Stroke*. 2018;49(3):e46-e110. doi:10.1161/STR.0000000000000158
7. Caplan LR, Wityk RJ, Glass TA, et al. New England Medical Center Posterior Circulation registry. *Ann Neurol*. 2004;56(3):389-398. doi:10.1002/ana.20204
8. Savitz SI, Caplan LR. Vertebrobasilar disease. *N Engl J Med*. 2005;352(25):2618-2626. doi:10.1056/NEJMra041544
9. Mangla R, Kolar B, Almast J, et al. Border zone infarcts: pathophysiologic and imaging characteristics. *Radiographics*. 2011;31(5):1201-1214. doi:10.1148/rg.315105014
10. Deng F, Mu C, Yang L, et al. Carotid plaque magnetic resonance imaging and recurrent stroke risk: A systematic review and meta-analysis. *Medicine (Baltimore)*. 2020;99(13):e19377. doi:10.1097/MD.0000000000019377
11. Kandarpa K, Machan L, Durham JD *Handbook of Interventional Radiologic Procedures* (Fifth Edit), Wolters Kluwer, pp 71-92
12. Brott TG, Halperin JL, Abbara S, et al. 2011 ASA/ACCF/AHA/AANN/AANS/ACR/ASNR/CNS/SAIP/SCAI/SIR/SNIS/SVM/SVS guideline on the management of patients with extracranial carotid and vertebral artery disease. A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, and the American Stroke Association, American Association of Neuroscience Nurses, American Association of Neurological Surgeons, American College of Radiology,

American Society of Neuroradiology, Congress of Neurological Surgeons, Society of Atherosclerosis Imaging and Prevention, Society for Cardiovascular Angiography and Interventions, Society of Interventional Radiology, Society of NeuroInterventional Surgery, Society for Vascular Medicine, and Society for Vascular Surgery [published correction appears in Circulation. 2011 Jul 26;124(4):e146. Dosage error in article text] [published correction appears in Circulation. 2012 Jul 10;126(2):e26]. *Circulation*. 2011;124(4):e54-e130. doi:10.1161/CIR.0b013e31820d8c98

13. Lawton MT, Vates GE. Subarachnoid Hemorrhage. *N Engl J Med*. 2017;377(3):257-266. doi:10.1056/NEJMcp1605827
14. Lennihan L, Mayer SA, Fink ME, et al. Effect of hypervolemic therapy on cerebral blood flow after subarachnoid hemorrhage : a randomized controlled trial. *Stroke*. 2000;31(2):383-391. doi:10.1161/01.str.31.2.383
15. Rinkel GJ, Feigin VL, Algra A, et al. Calcium antagonists for aneurysmal subarachnoid haemorrhage. *Cochrane Database Syst Rev*. 2005;(1):CD000277. Published 2005 Jan 25. doi:10.1002/14651858.CD000277.pub2
16. Zwienenberg-Lee M, Hartman J, Rudisill N, et al. Effect of prophylactic transluminal balloon angioplasty on cerebral vasospasm and outcome in patients with Fisher grade III subarachnoid hemorrhage: results of a phase II multicenter, randomized, clinical trial. *Stroke*. 2008;39(6):1759-1765. doi:10.1161/STROKEAHA.107.502666
17. Canedo-Antelo M, Baleato-González S, Mosqueira AJ, et al. Radiologic Clues to Cerebral Venous Thrombosis. *Radiographics*. 2019;39(6):1611-1628. doi:10.1148/rg.2019190015
18. Saposnik G, Barinagarrementeria F, Brown RD Jr, et al. Diagnosis and management of cerebral venous thrombosis: a statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2011;42(4):1158-1192. doi:10.1161/STR.0b013e31820a8364
19. Abdel Razek AA, Alvarez H, Bagg S, et al. Imaging spectrum of CNS vasculitis. *Radiographics*. 2014;34(4):873-894. doi:10.1148/rg.344135028

BÖLÜM 5

NON OKLÜZİV VASKÜLER PATOLOJİLER

Seray Akçalar[1]

Vaka 1: Benign Perimezensefalik Subaraknoid Kanama

Vaka 2: Hipertansif lobar hematom

Vaka 3: Epidural hematom ve travmatik SAK

Vaka 4: Akut ve subakut subdural hematom

Vaka 5: Serebral arteriyovenöz malformasyon

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KAYNAKÇA

1. Marder CP, Narla V, Fink JR, et al. Subarachnoid hemorrhage: beyond aneurysms. AJR Am J Roentgenol. 2014; 202 (1): 25-37.
2. Aguilar MI, Brott TG. Up date in intracerebral hemorrhage. AJNR Am J Neuroradiol. 2016 Feb; 37(2): 297-304.
3. Boswell S, Thorell W, Gogela S, et al. Angiogram-negative subarachnoid hemorrhage: outcomes data and review of the literature. J Stroke Cerebrovasc Dis 2013;22:750–757.
4. Brant WE, Helms CA. (2007) Fundamentals of Diagnostic Radiology. Lippincott Williams & Wilkins.
5. Bullock MR, Chesnut R, Ghajar J et al. Surgical management of acute epidural hematomas. Neurosurgery. 2006 Mar; 58(3 Suppl):S7-15
6. Carroll JJ, Lavine SD, Meyers PM. Imaging of Subdural Hematomas. Neurosurg Clin N Am 2017; 28:179.
7. Cerebral Shankar JJ, Lum C, Chakraborty S, et al. Vascular malformations: Time-resolved CT angiography comparede to DSA. Neuroradiol J. 2015 Jun;28(3):310-315.
8. Derdeyn CP, Zipfel GJ, Albuquerque FC, et al. Management of Brain Arteriovenous Malformations: A Scientific Statement for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke. 2017 Aug;48(8):e200-e224.
9. I-Chang Su, Kuo-Chuan Wang, Shih-Hao Huang, et al. Differential CT features of acute lentiform subdural hematoma and epidural hematoma. Clin Neurol Neurosurg. 2010 Sep;112(7):552-556.
10. Flaherty ML, Haverbusch M, Kissela B, et al. Perimesencephalic subarachnoid hemorrhage: incidence, risk factors, and outcome. J Stroke Cerebrovasc Dis. 2005;14 (6): 267-271.
11. Flaherty ML, Woo D, Haverbusch M, et al. Racial variations in location and risk of intracerebral hemorrhage. Stroke. 2005;36(5):934–937
12. Flaherty ML, Woo D, Haverbusch M, et al. Racial variations in location and risk of intracerebral hemorrhage. Stroke. 2005;36(5):934–937
13. Geibprasert S, Pongpech S, Jiarakongmun P, et al. Radiologic assessment of brain arteriovenous malformations: what clinicians need to know. Radiographics. 30 (2): 483-501.
14. Gennarelli TA, Thibault LE. Biomechanics of acute subdural hematoma. J Trauma 1982; 22:680.
15. Gerard C, Busl KM. Treatment of acute subdural hematoma. Curr Treat Options Neurol. 2014 Jan;16(1):275.
16. Guo C, Liu L, Wang B, et al. Swirl sign in traumatic acute epidural hematoma: prognostic value and surgical management. Neurol Sci. 2017 Dec;38(12):2111-2116. doi: 10.1007/s10072-017-3121-4. Epub 2017 Sep 11.
17. Heit JJ, Iv M, Wintermark M. Imaging of Intracranial Hemorrhage. J Stroke. 2017 Jan;19(1):11-27.
18. Heit JJ, Pastena GT, Nogueira RG, et al. Angiography for Evaluation of Patients with CT Angiogram-Negative Subarachnoid Hemorrhage: An 11-Year Experience. AJNR Am J Neuroradiology 2016 Feb;37(2):297-304.
19. Irie F, Le Brocque R, Kenardy J, et al. Epidemiology of traumatic epidural hematoma in young age. J Trauma. 2011;71 (4): 847-853.
20. J.E. Delgado Almandoz, P.W. Schaefer, N.P. Forero, et al. Diagnostic Accuracy and Yield of Multidetector CT Angiography in the Evaluation of Spontaneous Intraparenchymal Cerebral Hemorrhage. (2009) American Journal of Neuroradiologys. 30 (6): 1213.
21. Ko BS, Lee JK, Seo BR, et al. Clinical analysis of risk factors related to recurrent chronic subdural hematoma. J Korean Neurosurg Soc. 2008 Jan;43(1):11-5. doi: 10.3340/jkns.2008.43.1.11. Epub 2008 Jan 20.
22. Lee KS, Bae WK, Bae HG, et al. The computed tomographic attenuation and the age of subdural hematomas. J Korean Med Sci. 1997;12(4):353–9.
23. Loes DJ, Smoker WR, Biller J, et al. Nontraumatic lobar intracerebral hemorrhage: CT/angiographic correlation. AJNR. American journal of neuroradiology. 8 (6): 1027-30. Neurohospitalist. 2011 Jul;1(3):148-59.
24. Ohtani R , Kazui S, Tomimoto H et al. Clinical and radiographic features of lobar cerebral hemorrhage: hypertensive versus non-hypertensive cases. Intern Med. 2003 Jul;42(7):576-80.
25. Osborn AG. (1994) Diagnostic neuroradiology. Mosby Inc.
26. Park HR, Lee KS, Shim JJ et al. Multiple Densities of the Chronic Subdural Hematoma in CT Scans. J Korean Neurosurg Soc. 2013 Jul;54(1):38-41.
27. Rinkel GJ, Wijdicks EF, Vermeulen M, et al. Nonaneurysmal perimesencephalic subarachnoid hemorrhage: CT and MR patterns that differ from aneurysmal rupture. AJNR Am J Neuroradiol. 1991;12 (5): 829-34.
28. Sahni R, Weinberger J. Management of intracerebral hemorrhage. Vasc Health Risk Manag. 2007;3(5):701-9.
29. Smith WP, Batnitzky S, Rengachary SS. Acute isodense subdural hematomas: a problem in anemic patients. AJR Am J Roentgenol. 1981;136(3):543–6.
30. Solomon RA, Connolly ES Jr. Arteriovenous Malformations of the Brain. N Engl J Med. 2017 May 11;376(19):1859-1866.

31. Spetzler RF, Martin NA. A proposed grading system for arteriovenous malformations. J. Neurosurg. 1986;65 (4): 476-83.
32. Su IC, Wang KC, Huang SH, Li CH, et al. Perimesencephalic hemorrhage:a nonaneurysmal and benign form of subarachnoid hemorrhage. Neurology. 1985 Apr;35(4):493-7.
33. Verma SK, Borkar SA, Singh PK, et al. Traumatic Posterior Fossa Extradural Hematoma: Experience at Level I Trauma Center. Asian J Neurosurg. 2018 Apr-Jun;13(2):227-2

BÖLÜM 6

DURAL VE LEPTOMENİNGEAL TUTULUM İLE SEYREDEN HASTALIKLAR

Ezra Çetinkaya[1]

Vaka 1: EBV Meningoensefalit

Vaka 2: Menenjiom

Vaka 3: Primer Diffüz Leptomeningeal Gliomatozis(PDLG)

Vaka 4: Akut iskemik inme

Vaka 5: Sarkoidoz

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yönelik girişimlere de ihtiyaç duyulabilir(52,57). Hasta takibi her hastaya özgü değişmeliyken, göz muayenesi, kontrastlı Beyin MRG ya da PET görüntüleme fayda sağlar(59).

KAYNAKÇA

1. Di Carlo P, Trizzino M, Titone L, et al. Unusual MRI findings in an immunocompetent patient with EBV encephalitis: a case report. *BMC Med Imaging*. 2011;11:6. Doi:10.1186/1471-2342-11-6.
2. Akkoc G, Kadayifci EK, Karaaslan A, et al. Epstein-Barr virus encephalitis in an immunocompetent child: a case report and management of Epstein-Barr virus encephalitis. *Case Rep Infect*. 2016;7549252.
3. Hagemann G, Mentzel HJ, Weisser H, et al. Multiple reversible MR signal changes caused by Epstein-Barr virus encephalitis. *AJNR Am J Neuroradiol* 2006;27: 1447–1449.
4. Soares BP, Provenzale JM. Imaging of herpesvirus infections of the CNS. *AJR Am J Roentgenol*. 2016; 206: 39–48.
5. Han J, Kang Z, Xie Y, et al. Acute diffuse edematous-hemorrhagic Epstein-Barr virus meningoencephalitis: A case report. *Medicine (Baltimore)*. 2019;98(51):e18070. Doi:10.1097/MD.0000000000018070.
6. Doja A, Bitnun A, Ford Jones EL, et al. Pediatric Epstein- Barr virüs-associated encephalitis: 10- year review, *J Child Neurol.* 2006, 21: 384-391. Doi:10.1177/08830738060210051101.
7. Morand P, Lecuit M, Piroth L, et al. Infectious Encephalitis: Management without Etiological Diagnosis 48 Hours after Onset. *Méd. Mal. Infect*. 2017;47: 236–251. Doi: 10.1016/j.medmal.2017.02.004.
8. Costa, B.K.D, Sato D.K. Viral encephalitis: A practical review on diagnostic approach and treatment. *J. Pediatr*. 2020;12-19. Doi:10.1016/j.jped.2019.07.006.
9. Gupta R.K, Soni N, Kumar S, et al. Imaging of central nervous system viral diseases. *J. Magn. Reson. Imaging*, 2012;35: 477-491. Doi:10.1002/jmri.22830.
10. Lyndon D, Lansley JA, Evanson J, et al. Dural masses: meningiomas and their mimics. *Insights Imaging* 10, 11, 2019. Doi.org/10.1186/s13244-019-0697-7.
11. Chourmouzi D, Potsi S, Moumtzouoglou A, et al. Dural lesions mimicking meningiomas: A pictorial essay. *World J Radiol*. 2012;4(3): 75- 82. Doi:10.4329/wjr.v4.i3.75.
12. Huang RY, Bi WL, Griffith B, et al. Imaging and diagnostic advances for intracranial meningiomas. *Neuro Oncol*. 2019;21(Supplement_1): 44–61. Doi:10.1093/neuonc/noy143.
13. Lang FF, Macdonald OK, Fuller GN, et al. Primary extradural meningiomas: a report on nine cases and review of the literature from the era of computerized tomography scanning, *J Neurosurg*. 2000;93(6): 940–950.
14. Parizel PM, Carpentier K, Van Marck V, et al. . Pneumosinus dilatans in anterior skull base meningiomas. Neuroradiology 2013;55: 307–311.
15. Zakhari N, Torres C, Castillo M, et al. Uncommon Cranial Meningioma: Key Imaging Features on Conventional and Advanced Imaging. Clin Neuroradiol 27, 2017; 135–144. Doi:10.1007/s00062-017-0583-y.
16. Kousi E, Tsougos I, Fountas K, et al. Distinct peak at 3.8 ppm observed by 3T MR spectroscopy in meningiomas, while nearly absent in high-grade gliomas and cerebral metastases. Mol Med Rep. 2012;5(4): 1011- 1018. Doi:10.3892/mmr.2012.773.
17. Yang S, Law M, Zagzag D, et al. Dynamic contrast-enhanced perfusion MR imaging measurements of endothelial permeability: differentiation between atypical and typical meningiomas. AJNR Am J Neuroradiol 2003;24: 1554–1559.
18. Tamrazi B, Shiroishi MS, Liu CS. Advanced Imaging of Intracranial Meningiomas. Neurosurg Clin N Am. 2016;27(2): 137- 143. Doi:10.1016/j.nec.2015.11.004.
19. Zhang H, Rödiger LA, Shen T, et al. Preoperative subtyping of meningiomas by perfusion MR imaging. Neuroradiology 50, 835, 2008. Doi:10.1007/s00234-008-0417-3.
20. Aslan K, Gunbey HP, Tomak L, et al. The diagnostic value of using combined MR diffusion tensor imaging parameters to differentiate between low- and high-grade meningioma. Br J Radiol. 2018;91(1088): Doi:10.1259/bjr.20180088.
21. Smith AB, Szakaly IH, Schroeder JW, et al. From the radiologic pathology archives: mass lesions of the dura: beyond meningioma-radiologic-pathologic correlation, Radiographics, 34,2014: 295-312.
22. Fogh SE, Johnson DR, Barker FG, et al. Case-Based Review: meningioma. Neurooncol Pract. 2016;3(2): 120- 134. Doi:10.1093/nop/npv063.
23. Starr CJ, Cha S, Meningioma mimics: five key imaging features to differentiate them from meningiomas. 2017, Clinical Radiology, 72 (9): 722-728.
24. Buerki RA, Horbinski CM, Kruser T, et al. An overview of meningiomas. Future Oncol. 2018;14(21):

2161- 2177. Doi:10.2217/fon-2018-0006.
25. Nigim F, Wakimoto H, Kasper EM, et al. Emerging Medical Treatments for Meningioma in the Molecular Era. Biomedicines. 2018;6(3): 86. Doi:10.3390/biomedicines6030086.
26. Rogers L, Barani I, Chamberlain M, et al. Meningiomas: knowledge base, treatment outcomes, and uncertainties. A RANO review. J Neurosurg. 2015;122(1): 4- 23. Doi:10.3171/2014.7.JNS131644.
27. Ishige S, Iwadate Y, Ishikura H, et al. Primary diffuse leptomeningeal gliomatosis followed with serial magnetic resonance images. Neuropathol 2007; 27: 290-294. Doi.org/10.1111/j.1440-1789.2007.00760.x.
28. Debono B, Derrey S, Rabehenoina C, Primary diffuse multinodular leptomeningeal gliomatosis: case report and review of the literature. *Surg Neurol.* 2006 Mar;65(3): 273-82; Doi:10.1016/j.surneu.2005.06.038.
29. Chellathurai A, Vaidya JS, Kathirvelu G, et al. Primary diffuse leptomeningeal oligodendrogliomatosis: A case report and literature review. *Indian J Radiol Imaging*. 2016;26(3): 337- 341. Doi:10.4103/0971-3026.190424.
30. Sulentic, V, Hajnsek S, Petelin Gadze Z, et al. Primary diffuse leptomeningeal gliomatosis: early diagnostic signs. *Neurological Sciences*, 2015 36(9): 1697–1699. Doi:10.1007/s10072-015-2225-y.
31. Jiang Y, Chen J, He J, et al. Parenchymal Infiltration in Primary Diffuse Leptomeningeal Gliomatosis: Dynamic Changes in Brain MRI. *Front Oncol.* 2017;7: 240. Published 2017 Oct 9. Doi:10.3389/fonc.2017.00240.
32. Riva M, Bacigaluppi S, Galli C, et al. Primary leptomeningeal gliomatosis: case report and review of the literature. *Neurol Sci.* 2005 Jun; 26(2):129-134.
33. Ahmad E, Mohamed M, Vrettos A. Primary Diffuse Leptomeningeal Gliomatosis: Radiological/Pathological Features. *Case Rep Neurol Med*. 2016;2016: 5016840. Doi:10.1155/2016/5016840.
34. Debono B, Derrey S, Rabehenoina C, et al. Primary diffuse multinodular leptomeningeal gliomatosis: case report and review of the literature. *Surgical Neurology.* 2006 Mar;65(3): 273-282; discussion 282. Doi: 10.1016/j.surneu.2005.06.038.
35. Hansen N, Wittig A, Hense J,et al. Long survival of primary diffuse leptomeningeal gliomatosis following radiotherapy and temozolomide: case report and literature review. *Eur J Med Res* 2011; 16: 415-419.
36. Sivák Š, Kantorová E, Kurča E, et al. Primary diffuse leptomeningeal gliomatosis as a rare cause of pain in cervical spine. *BMC Cancer*. 2016;16: 182. Published 2016 Mar 4. Doi:10.1186/s12885-016-2224-2.
37. Jabeen SA, Chowdary AH, Kandadai RM, et al. Primary diffuse leptomeningeal gliomatosis: An autopsy case report. *Ann Indian Acad Neurol*. 2014;17(2): 227- 230. Doi:10.4103/0972-2327.132647.
38. Adam G, Ferrier M, Patsoura S, et al. Magnetic resonance imaging of arterial stroke mimics: a pictorial review. *Insights Imaging*. 2018;9(5): 815- 831. Doi:10.1007/s13244-018-0637-y.
39. Vilela, P. Acute stroke differential diagnosis: Stroke mimics. *European Journal of Radiology*, 2017,96: 133–144. Doi:10.1016/j.ejrad.2017.05.008.
40. Rowley H, Vagal A. Stroke and Stroke Mimics: Diagnosis and Treatment. In: Hodler J, Kubik-Huch R, von Schulthess G. (eds) *Diseases of the Brain, Head and Neck, Spine* 2020–2023. IDKD Springer Series. Springer, Cham, Doi.org/10.1007/978-3-030-38490-6_3.
41. Yong AW, Morris Z, Shuler K, et al. Acute symptomatic hypoglycaemia mimicking ischaemic stroke on imaging: a systemic review. *BMC Neurol*. 2012: 12:139. Published 2012 Nov 21. Doi:10.1186/1471-2377-12-139.
42. Oppenheim C, Galanaud D, Samson Y, et al. Can diffusion weighted magnetic resonance imaging help differentiate stroke from stroke-like events in MELAS? *J Neurol Neurosurg Psychiatry*. 2000;69(2): 248- 250. Doi:10.1136/jnnp.69.2.248.
43. Jayaraman K, Rangasami R, Chandrasekharan A. Magnetic Resonance Imaging Findings in Viral Encephalitis: A Pictorial Essay. *J Neurosci Rural Pract.* 2018;9(4): 556- 560. Doi:10.4103/jnrp.jnrp_120_18.
44. Chen SJ, Tsai HH, Tsai LK, et al. Advances in cerebral amyloid angiopathy imaging. *Ther Adv Neurol Disord*. 2019;12: 1756286419844113. Published 2019 May 3. Doi:10.1177/1756286419844113.
45. Kamalian S, Kamalian S, Boulter DJet al. Stroke differential diagnosis and mimics: Part 1. *Appl Radiol*. 2015;44(11): 26-39.
46. Lin MP, Liebeskind DS. Imaging of Ischemic Stroke. Continuum (Minneap Minn). 2016;22(5, *Neuroimaging*): 1399- 1423. Doi:10.1212/CON.0000000000000376.
47. Kamalian S, Lev MH, Stroke Imaging. *Radiologic Clinics of North America*. 2019, 57(4): 717-732. Doi:10.1016/j.rcl.2019.02.001.
48. Sammarra I, Barbagallo G, Labate A, et al. Value of Multimodal Imaging Approach to Diagnosis of Neurosarcoidosis. *Brain Sci.* 2019;9(10): 243. Published 2019 Sep 21. Doi:10.3390/brainsci9100243.
49. Bathla G, Singh AK, Policeni B, et al. Imaging of neurosarcoidosis: common, uncommon, and rare. *Clinical Radiology*, 2016, 71(1), 96–106. Doi:10.1016/j.crad.2015.09.007.
50. Bathla G, Soni N, Endozo R, et al. Magnetic resonance texture analysis utility in differentiating intraparenchymal neurosarcoidosis from primary central nervous system lymphoma: a preliminary analysis. *The Neuroradiology Journal,* 2019, 197140091983017. Doi:10.1177/1971400919830173.

51. Bathla G, Watal P, Gupta S, et al. Cerebrovascular Manifestations of Neurosarcoidosis: An Underrecognized Aspect of the Imaging Spectrum, *American Journal of Neuroradiology,* July 2018, 39 (7): 1194-1200; DOI: https://doi.org/10.3174/ajnr.A5492.
52. Berri MA, Rouimi A. Neurosarcoïdose cérébrale [Cerebral neurosarcoidosis]. *Pan Afr Med J*. 2018;30: 67. Published 2018 May 28. doi:10.11604/pamj.2018.30.67.15632.
53. Caton MT Jr, Yau WW, Huang RY, et al. Teaching NeuroImages: Corkscrew medullary veins in active neurosarcoidosis, *Neurology,* Nov 2019, 93 (19): 1832-1833. DOI: 10.1212/WNL.0000000000008460.
54. Zamora C, Hung SC, Tomingas C, et al. Engorgement of Deep Medullary Veins in Neurosarcoidosis: A Common-Yet-Underrecognized Cerebrovascular Finding on SWI, *American Journal of Neuroradiology* Nov 2018, 39 (11): 2045-2050. DOI: 10.3174/ajnr.A5783.
55. Stern BJ, Royal W, Gelfand JM, et al. Definition and Consensus Diagnostic Criteria for Neurosarcoidosis. *JAMA Neurology*. 2018. Doi:10.1001/jamaneurol.2018.2295.
56. Aygun N, Shah G, Ghandi D, Neurosarcoidosis, *Pearls and pitfalls in Head and Neck and Neuroimaging: Variants and Other Difficult Diagnoses,* New York, Cambrigde University Press. 2013: 72-73.
57. Fritz D, van de Beek D, Brouwer MC, Clinical features, treatment and outcome in neurosarcoidosis: systematic review and meta-analysis. *BMC Neurology*, 2016, 16(1). Doi:10.1186/s12883-016-0741-x.
58. Pawate S, Moses H, Sriram S, Presentations and outcomes of neurosarcoidosis: a study of 54 cases. *QJM: An International Journal of Medicine,* 2009,102(7): 449–460. Doi:10.1093/qjmed/hcp042.
59. Ibitoye RT, Wilkins A, Scolding NJ. Neurosarcoidosis: a clinical approach to diagnosis and management. *J Neurol*. 2017;264(5): 1023- 1028. Doi:10.1007/s00415-016-8336-4.

BÖLÜM 7

HİDROSEFALİ VE DİĞER BOS BOZUKLUKLARI

Temel Fatih YILMAZ[1]

Vaka 1: Koroidal pleksus papillomu

Vaka 2: Normal basınçlı hidrosefali

Vaka 3: Aquaduktal web

Vaka 4: Chiari malformasyonuna sekonder hidrosefali

Vaka 5: Rinore, BOS kaçağı

Vaka 6: Komünikan hidrosefali

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Tanı

- Kommünikan hidrosefali

Ayırıcı Tanı

Atrofik hidrosefali

Normal basınçlı hidrosefali

Önemli Noktalar

Etiyolojik faktörler arasında subaraknoid kanama, menenjit, normal basınçlı hidrosefali ve leptomeningeal tutulum gösterilebilir. Beyin omurilik sıvısındaki azalmış rezorpsiyona sekonder olduğu düşünülmektedir (9).

Tuzaklar

Komünikan hidrosefaliyi parankimal hacim kaybı nedeniyle ventriküllerin ex vacuo dilatasyonu olan hastalarda görülen ventriküler genişlemeden ayırt etmek zor olabilir. Üçüncü ventrikül ve lateral ventriküllerin temporal hornlarındaki genişleme tanı için önemlidir çünkü ex vacuo dilatasyonu olan hastalarda bu bölgeler nispeten korunur (10).

Tedavi ve yaklaşım

Komünikan hidrosefali tedavisinde endoskopik yöntemlerin aksine genellikle ventrikülоperitoneal şant prosedürleri kullanılmaktadır.

KAYNAKÇA

1. Lin, H., Leng, X., Qin, C. *et al.* Choroid plexus tumours on MRI: similarities and distinctions in different grades. *Cancer Imaging* 19, 17 (2019).
2. Guermazi A, De Kerviler E, Zagdanski AM, Frija J. Diagnostic imaging of choroid plexus disease. *Clin Radiol*. 2000;55:503–16.
3. Mori E, Ishikawa M, Kato T, Kazui H, Miyake H, Miyajima M, Nakajima M, Hashimoto M, Kuriyama N, Tokuda T, Ishii K, Kaijima M, Hirata Y, Saito M, Arai H. Guidelines for management of idiopathic normal pressure hydrocephalus: second edition. (2012) *Neurologia medico-chirurgica*. 52 (11): 775-809
4. Hurley RA, Bradley WG, Latifi HT et-al. Normal pressure hydrocephalus: significance of MRI in a potentially treatable dementia. *J Neuropsychiatry Clin Neurosci*. 1999;11 (3): 297-300.
5. Flora N, Kulasekaran N, Mudali S K, Swaminathan T S, Compensated aquaduct of sylvius obstruction by web-a case report. *Indian J Radiol Imaging* 2005;15:19-20
6. Chiapparini L, Saletti V, Solero CL, et al. Neuroradiological diagnosis of Chiari malformations. *Neurol. Sci*. 2011;32 Suppl 3 (S3): S283-6.
7. Aiken AH, Hoots JA, Saindane AM et-al. Incidence of cerebellar tonsillar ectopia in idiopathic intracranial hypertension: a mimic of the Chiari I malformation. *AJNR Am J Neuroradiol*. 2012;33 (10): 1901-6

8. Guang Yong Chen, Long Ma, Mei Ling Xu et al. Spontaneous cerebrospinal fluid rhinorrhea: A case report and analysis. *Medicine (Baltimore)* 2018 Feb; 97(5): e9758
9. Kartal MG, Algin O. Evaluation of hydrocephalus and other cerebrospinal fluid disorders with MRI: An update. Insights Imaging. 2014;5 (4): 531-41
10. Yılmaz TF, Aralasmak A, Toprak et al. Evaluation of CSF flow metrics in patients with communicating hydrocephalus and idiopathic intracranial hypertension. *Radiol Med*. 2019 May;124(5):382-391.

BÖLÜM 8

EPİLEPSİ

Berrak Barutcu ASFUROĞLU[1]
Umut ASFUROĞLU[2]

Vaka 1: Disembriyoplastik Nöroendokrin Tümör (DNET)

Vaka 2: Tüberoskleroz

Vaka 3: Fokal kortikal displazi (FKD) Tip IIb

Vaka 4: Status Epileptikus (SE)

Vaka 5: Sol mezial temporal skleroz (MTS)

Vaka 6: Sturge Weber Sendromu (SWS)

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KAYNAKÇA

1. Bulakbasi N, Kocaoglu M, Sanal TH, et al. Dysembryoplastic neuroepithelial tumors: proton MR spectroscopy, diffusion and perfusion characteristics. *Neuroradiology*. 2007;49(10):805-12.
2. Cosson RS, Varlet P, Beuvon F, et al. Dysembryoplastic neuroepithelial tumors: CT, MR findings and imaging follow-up: a study of 53 cases. *Journal of neuroradiology*. 2001;28(4):230-40.
3. Raybaud C, Shroff M, Rutka JT, et al. Imaging surgical epilepsy in children. *Child's Nervous System*. 2006;22(8):786-809.
4. Kuroiwa T, Kishikawa T, Kato A, et al. Dysembryoplastic neuroepithelial tumors: MR findings. *Journal of computer assisted tomography*. 1994;18(3):352-6.
5. Osborn AG, Hedlund G, Salzman K. Osborn's Brain: Imaging. Pathology, and Anatomy (1 Har/Psc, p 1200). 2013.
6. Cossu M, Fuschillo D, Bramerio M, et al. Epilepsy surgery of focal cortical dysplasia–associated tumors. *Epilepsia*. 2013;54:115-22.
7. Shin JH, Lee HK, Khang SK, et al. Neuronal tumors of the central nervous system: radiologic findings and pathologic correlation. *Radiographics*. 2002;22(5):1177-89.
8. Bulakbasi N, Kocaoglu M, Örs F, et al. Combination of single-voxel proton MR spectroscopy and apparent diffusion coefficient calculation in the evaluation of common brain tumors. *American Journal of Neuroradiology*. 2003;24(2):225-33.
9. Ozlen F, Gunduz A, Asan Z, et al. Dysembryoplastic neuroepithelial tumors and gangliogliomas: clinical results of 52 patients. *Acta neurochirurgica*. 2010;152(10):1661-71.
10. Byun J, Hong SH, Kim Y-H, et al. Peritumoral edema affects the prognosis in adult pleomorphic xanthoastrocytoma: retrospective analysis of 25 patients. *World neurosurgery*. 2018;114:e457-e67.
11. Luzzi S, Elia A, Del Maestro M, et al. Dysembryoplastic neuroepithelial tumors: what you need to know. *World Neurosurg.* 2019;127:255-65.
12. Oğuz KK. Epilepside Görüntüleme. *Türkiye Klinikleri Radiology-Special Topics*. 2008;1(3):69-85.
13. Nguyen HS, Doan N, Gelsomino M, et al. Dysembryoplastic neuroectodermal tumor: an analysis from the surveillance, epidemiology, and end results program, 2004–2013. *World neurosurgery*. 2017;103:380-5.
14. McMurdo Jr SK, Moore SG, Brant-Zawadzki M, et al. MR imaging of intracranial tuberous sclerosis. *American Journal of Roentgenology*. 1987;148(4):791-6.
15. Baron Y, Barkovich AJ. MR imaging of tuberous sclerosis in neonates and young infants. *American Journal of Neuroradiology*. 1999;20(5):907-16.
16. Manoukian SB, Kowal DJ. Comprehensive imaging manifestations of tuberous sclerosis. *American Journal of Roentgenology*. 2015;204(5):933-43.
17. Umeoka S, Koyama T, Miki Y, et al. Pictorial review of tuberous sclerosis in various organs. *Radiographics*. 2008;28(7):e32.
18. Roth J, Roach ES, Bartels U, et al. Subependymal giant cell astrocytoma: diagnosis, screening, and treatment. Recommendations from the International Tuberous Sclerosis Complex Consensus Conference 2012. *Pediatric neurology*. 2013;49(6):439-44.
19. Jansen FE, Braun KP, van Nieuwenhuizen O, et al. Diffusion-weighted magnetic resonance imaging and identification of the epileptogenic tuber in patients with tuberous sclerosis. *Archives of neurology*. 2003;60(11):1580-4.
20. Kuzniewska B, Sadowski K, Urbanska K, et al. The level of microRNA 21 is upregulated by rapamycin in serum of tuberous sclerosis complex patients and subependymal giant cell astrocytoma (SEGA)-derived cell cultures. *Folia neuropathologica*. 2018;56(3):167-74.
21. Shepherd CW, Gomez MR, Lie J, et al, editors. Causes of death in patients with tuberous sclerosis. *Mayo Clinic Proceedings*; 1991: Elsevier.
22. Blümcke I, Thom M, Aronica E, et al. The clinicopathologic spectrum of focal cortical dysplasias: A consensus classification proposed by an ad hoc task force of the ILAE Diagnostic Methods Commission 1. *Epilepsia*. 2011;52(1):158-74.
23. Kabat J, Król P. Focal cortical dysplasia–review. *Polish journal of radiology*. 2012;77(2):35.
24. Barkovich AJ, Kuzniecky RI, Bollen AW, et al. Focal transmantle dysplasia: a specific malformation of cortical development. *Neurology*. 1997;49(4):1148-52.
25. Chung CK, Lee SK, Kim KJ. Surgical outcome of epilepsy caused by cortical dysplasia. *Epilepsia*. 2005;46:25-9.
26. Lerner JT, Salamon N, Hauptman JS, et al. Assessment and surgical outcomes for mild type I and severe type II cortical dysplasia: a critical review and the UCLA experience. *Epilepsia*. 2009;50(6):1310-35.
27. Osborn AG, Salzman KL, Jhaveri MD, et al. Diagnostic imaging: brain E-book: Elsevier Health Sciences; 2015.

28. Glauser T, Shinnar S, Gloss D, Alldredge B, et al. Evidence-based guideline: treatment of convulsive status epilepticus in children and adults: report of the Guideline Committee of the American Epilepsy Society. *Epilepsy currents*. 2016;16(1):48-61.
29. Cartagena A, Young G, Lee D, Mirsattari S. Reversible and irreversible cranial MRI findings associated with status epilepticus. *Epilepsy & Behavior*. 2014;33:24-30.
30. Cianfoni A, Caulo M, Cerase A, et al. Seizure-induced brain lesions: a wide spectrum of variably reversible MRI abnormalities. *European journal of radiology*. 2013;82(11):1964-72.
31. Korngut L, Young G, Lee D, et al. Irreversible brain injury following status epilepticus. *Epilepsy & Behavior*. 2007;11(2):235-40.
32. Samaniego EA, Stuckert E, Fischbein N, et al. Crossed cerebellar diaschisis in status epilepticus. *Neurocritical care*. 2010;12(1):88-90.
33. Cartagena AM, Young GB. Neuroimaging in Status Epilepticus. Continuous EEG Monitoring: Springer; 2017. p. 279-86.
34. Engel Jr J. Surgery for seizures. *New England Journal of Medicine*. 1996;334(10):647-53.
35. Babb T. Pathological findings in epilepsy. *Surgical treatment of the epilepsies*. 1987:511-40.
36. Babb TL, Brown WJ, Pretorius J, et al. Temporal lobe volumetric cell densities in temporal lobe epilepsy. *Epilepsia*. 1984;25(6):729-40.
37. Dam AM. Hippocampal neuron loss in epilepsy and after experimental seizures. *Acta Neurologica Scandinavica*. 1982;66(6):601-42.
38. Bronen RA. Epilepsy: the role of MR imaging. *AJR American journal of roentgenology*. 1992;159(6):1165-74.
39. Muro GJ, Karis JP. Neuroimaging in temporal lobe epilepsy. CNS Spectrums. 1997;2(7):31-42.
40. Oppenheim C, Dormont D, Biondi A, et al. Loss of digitations of the hippocampal head on high-resolution fast spin-echo MR: a sign of mesial temporal sclerosis. *American journal of neuroradiology*. 1998;19(3):457-63.
41. Engel Jr J. Mesial temporal lobe epilepsy: what have we learned? *The neuroscientist*. 2001;7(4):340-52.
42. Di Rocco C, Tamburrini G. Sturge–Weber syndrome. *Child's nervous system*. 2006;22(8):909.
43. Lin DD, Barker PB, Kraut MA, et al. Early characteristics of Sturge-Weber syndrome shown by perfusion MR imaging and proton MR spectroscopic imaging. *American journal of neuroradiology*. 2003;24(9):1912-5.
44. Thomas-Sohl KA, Vaslow DF, Maria BL. Sturge-Weber syndrome: a review. *Pediatric neurology*. 2004;30(5):303-10.
45. Davis L. Current Pediatric Diagnosis and Treatment. Edited by William W. Hay, Jr, Anthony R. Hayward, Myron Levin, and Judith M. Sondheimer. 1415 pp. New York, McGraw Hill, 2003. *Am Board Family Med*; 2003.

BÖLÜM 9

DEMİYELİNİZAN VE DİSMİYELİNİZAN HASTALIKLAR

Zakir Sakcı[1]

Vaka 1: Multipl Skleroz

Vaka 2: Tümefaktif Multipl Skleroz, Servikal tutulum

Vaka 3: Akut Dissemine Ensefalomiyelit (ADEM)

Vaka 4: Nöromiyelitis optika, Optik nörit

Vaka 5: Canavan Hastalığı

Vaka 6: Alexander Hastalığı

Vaka 7: X'e bağlı Adrenolökodistrofi

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yon görülür. T2 ağırlıklı MRG'de orta derece hiperintens olup kontrast tutmaz. ALD'de proton MR spektroskopi NAA pikinde azalma, kolin pikinde artma miyoinozitol pikinde azalma ve laktat pikinde artma görülür (18–20).

Tuzaklar

Neonatal hipoglisemide korpus kallozum splenium, peritrigonal beyaz cevher ve oksipital korteks tutulabilir. Postkontrast görüntülerde kontrastlanma izlenmez. Aleksander hastalığında peritrigonal beyaz cevherden ziyade frontal periventriküler beyaz cevher tutulur. Postkontrast serilerde kontrastlanma görülebilir.

Tedavi ve yaklaşım

Lorenzo'nun yağı semptomların gelişmesini geciktirebilir. Kemik iliği transplantasyonu ve kök hücre tedavisi denenebilir. Tedavi sonrası metabolik stabilizasyon ve kısmen geri dönüş görülebilir (20).

KAYNAKÇA

1. Filippi M, Rocca MA. MR Imaging of Multiple Sclerosis. *Radiology*. [Online] Radiology; 2011;259(3): 659–681. Available from: doi:10.1148/radiol.11101362 [Accessed: 26th July 2020]
2. Filippi M, Rocca MA. Conventional MRI in Multiple Sclerosis. *Journal of Neuroimaging*. [Online] John Wiley & Sons, Ltd; 2007;17(SUPPL. 1): 3S-9S. Available from: doi:10.1111/j.1552-6569.2007.00129.x [Accessed: 26th July 2020]
3. Thompson AJ, Banwell BL, Barkhof F, Carroll WM, Coetzee T, Comi G, et al. Diagnosis of multiple sclerosis: 2017 revisions of the McDonald criteria. *The Lancet Neurology*. [Online] Lancet Publishing Group; 2018;17(2): 162–173. Available from: doi:10.1016/S1474-4422(17)30470-2 [Accessed: 26th July 2020]
4. Roosendaal SD, Barkhof F. Imaging Phenotypes in Multiple Sclerosis. *Neuroimaging Clinics of North America*. [Online] W.B. Saunders; 2015;25(1): 83–96. Available from: doi:10.1016/j.nic.2014.09.008 [Accessed: 26th July 2020]
5. De Stefano N, Smith SA. Spinal cord imaging in multiple sclerosis: Filling the gap with the brain. *Neurology*. [Online] Lippincott Williams and Wilkins; 2014;83(15): 1306–1307. Available from: doi:10.1212/WNL.0000000000000873 [Accessed: 26th July 2020]
6. Makary MS, Kirsch CF. Tumefactive demyelinating disease with isolated spinal cord involvement. *Acta Radiologica Short Reports*. [Online] SAGE Publications; 2014;3(5): 204798161453932. Available from: doi:10.1177/2047981614539324 [Accessed: 26th July 2020]
7. Bester M, Petracca M, Inglese M. Neuroimaging of Multiple Sclerosis, Acute Disseminated Encephalomyelitis, and Other Demyelinating Diseases. *Seminars in Roentgenology*. [Online] Semin Roentgenol; 2014;49(1): 76–85. Available from: doi:10.1053/j.ro.2013.09.002 [Accessed: 26th July 2020]
8. Karussis D. The diagnosis of multiple sclerosis and the various related demyelinating syndromes: A critical review. *Journal of Autoimmunity*. [Online] Academic Press; 2014;48–49: 134–142. Available from: doi:10.1016/j.jaut.2014.01.022 [Accessed: 26th July 2020]
9. Callen DJA, Shroff MM, Branson HM, Li DK, Lotze T, Stephens D, et al. Role of MRI in the differentiation of ADEM from MS in children. *Neurology*. [Online] Lippincott Williams and Wilkins; 2009;72(11): 968–973. Available from: doi:10.1212/01.wnl.0000338630.20412.45 [Accessed: 26th July 2020]
10. Kim HJ, Paul F, Lana-Peixoto MA, Tenembaum S, Asgari N, Palace J, et al. MRI characteristics of neuromyelitis optica spectrum disorder. *Neurology*. [Online] Lippincott Williams and Wilkins; 2015;84(11): 1165–1173. Available from: doi:10.1212/WNL.0000000000001367 [Accessed: 26th July 2020]
11. Jacob A, McKeon A, Nakashima I, Sato DK, Elsone L, Fujihara K, et al. Current concept of neuromyelitis

optica (NMO) and NMO spectrum disorders. *Journal of Neurology, Neurosurgery & Psychiatry*. [Online] BMJ Publishing Group; 2013;84(8): 922–930. Available from: doi:10.1136/jnnp-2012-302310 [Accessed: 26th July 2020]

12. Kawachi I, Nishizawa M. [Characteristic features of radiological findings in multiple sclerosis and neuromyelitis optica]. *Nihon rinsho. Japanese journal of clinical medicine*. [Online] 2014;72(11): 1976–1982. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25518380 [Accessed: 26th July 2020]
13. Baslow MH, Guilfoyle DN. Canavan disease, a rare early-onset human spongiform leukodystrophy: Insights into its genesis and possible clinical interventions. *Biochimie*. [Online] Biochimie; 2013;95(4): 946–956. Available from: doi:10.1016/j.biochi.2012.10.023 [Accessed: 26th July 2020]
14. Guo F, Bannerman P, Mills Ko E, Miers L, Xu J, Burns T, et al. Ablating N-acetylaspartate prevents leukodystrophy in a Canavan disease model. *Annals of Neurology*. [Online] John Wiley and Sons Inc.; 2015;77(5): 884–888. Available from: doi:10.1002/ana.24392 [Accessed: 26th July 2020]
15. Gómez-Pinedo U, Duran-Moreno M, Sirerol-Piquer S, Matias-Guiu J. Myelin changes in Alexander disease. *Neurología (English Edition)*. [Online] Elsevier BV; 2018;33(8): 526–533. Available from: doi:10.1016/j.nrleng.2017.01.006 [Accessed: 26th July 2020]
16. Brenner M, Messing A. A new mutation in GFAP widens the spectrum of Alexander disease. *European Journal of Human Genetics*. [Online] Nature Publishing Group; 2015;23(1): 1–2. Available from: doi:10.1038/ejhg.2014.99 [Accessed: 26th July 2020]
17. Messing A, Brenner M, Feany MB, Nedergaard M, Goldman JE. Alexander Disease. *Journal of Neuroscience*. [Online] J Neurosci; 2012;32(15): 5017–5023. Available from: doi:10.1523/JNEUROSCI.5384-11.2012 [Accessed: 26th July 2020]
18. Siddiqui S, Pawar G, Hogg JP. MRI in X-linked adrenoleukodystrophy. *Neurology*. [Online] Lippincott Williams and Wilkins; 2015;84(2): 211–211. Available from: doi:10.1212/WNL.0000000000001122 [Accessed: 26th July 2020]
19. de Beer M, Engelen M, van Geel BM. Frequent occurrence of cerebral demyelination in adrenomyeloneuropathy. *Neurology*. [Online] Lippincott Williams and Wilkins; 2014;83(24): 2227–2231. Available from: doi:10.1212/WNL.0000000000001074 [Accessed: 26th July 2020]
20. Engelen M, Kemp S, Poll-The B-T. X-Linked Adrenoleukodystrophy: Pathogenesis and Treatment. *Current Neurology and Neuroscience Reports*. [Online] Current Medicine Group LLC 1; 2014;14(10): 486. Available from: doi:10.1007/s11910-014-0486-0 [Accessed: 26th July 2020]

BÖLÜM 10

METABOLİK VE TOKSİK HASTALIKLAR

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Ayırıcı Tanı

Alexander hastalığı, Canavan hastalığı ve Glutarik asidüri, ayırıcı tanıda düşünülebilir. Bu hastalıklarda MRG'de subkortikal kist yoktur ve hepsinde bazal gangliyon tutulumu görülür (13).

Önemli Noktalar

Van Der Knaap hastalığı megalensefalik lökoensefalopati ve subkortikal kistlerle karakterize, MLC 1 geni mutasyonuna bağlı kalıtsal otozomal resesif bozukluktur. Klinik olarak makrosefali, motor gelişim geriliği ve nöbetlerle karakterizedir. İlerleyen dönemlerde kademeli ataksi ve piramidal bulgular eklenir. Zihinsel kapasiteler genellikle korunur, ancak hafif bozulma olabilir. Tanı için klinik özellikler ve MRG bulgularının kombinasyonu gereklidir (13). Hastaların çoğu erken ergenlikte tekerlekli sandalyeye bağımlı hale gelir. 2. ya da 3. dekadda ölüm görülür (14).

Tipik MRG bulguları 6. aydan itibaren görülebilir. Periventriküler bölgenin korunduğu beyaz cevher tutulumu izlenir, gri cevher tutulmaz. Temporal ve frontoparietal bölgede bilateral subkortikal kistler görülür (14).

Tuzaklar

Beyaz cevher tutulum şiddeti ile hastalığın klinik seyri arasında uyumsuzluk bulunur. Klinik bulgular yavaş seyirlidir (14).

Tedavi ve yaklaşım

Van Der Knaap hastalığının kesin bir tedavisi yoktur. Nöbetleri önlemek için antiepileptikler ve motor bozukluğa yönelik fizyoterapi uygulanır (14).

KAYNAKÇA

1. Steenweg ME, Salomons GS, Yapici Z, et al. L-2-Hydroxyglutaric aciduria: pattern of MR imaging abnormalities in 56 patients. *Radiology.* 2009;251(3): 856-865. DOI:10.1148/radiol.2513080647.
2. Canda E, Köse M, Yazıcı H, et al. Clinical, Neuroimaging, and Genetic Features of the Patients with L-2-Hydroxyglutaric Aciduria. *J Pediatr Res*. 2018;5(1): 39-43. DOI:10.4274/jpr.59454.
3. Poll-The BT, Gärtner J. Clinical diagnosis, biochemical findings and MRI spectrum of peroxisomal disorders. *Biochim Biophys Acta.* 2012;1822(9): 1421-1429. DOI:10.1016/j.bbadis.2012.03.011.
4. Eichler F, Duncan C, Musolino PL, et al. Hematopoietic Stem-Cell Gene Therapy for Cerebral Adrenoleukodystrophy. *N Engl J Med.* 2017;377(17): 1630-1638. DOI:10.1056/NEJMoa1700554.
5. Kölker S, Christensen E, Leonard JV, et al. Diagnosis and management of glutaric aciduria type I--revised recommendations. *J Inherit Metab Dis*. 2011;34(3): 677-694. DOI:10.1007/s10545-011-9289-.
6. Neumaier-Probst E, Harting I, Seitz A, et al. Neuroradiological findings in glutaric aciduria type I (glutaryl-CoA dehydrogenase deficiency). *J Inherit Metab Dis.* 2004;27(6): 869-876. DOI:10.1023/B:BOLI.0000045771.66300.2a.

7. Hoshino H, Kubota M. Canavan disease: clinical features and recent advances in research. *Pediatr Int.* 2014;56(4): 477-483. DOI:10.1111/ped.12422.
8. Traeger EC, Rapin I. The Clinical Course of Canavan Disease. *Pediatr Neurol.* 1998;18(3): 207-212. DOI:10.1016/s0887-8994(97)00185-
9. Kim TS, Kim IO, Kim WS, et al. MR of childhood metachromatic leukodystrophy. *AJNR Am J Neuroradiol.* 1997;18(4): 733-738.
10. Gieselmann V, Krägeloh-Mann I. Metachromatic leukodystrophy--an update. *Neuropediatrics.* 2010;41(1): 1-6. DOI:10.1055/s-0030-1253412.
11. Muthusamy K, Sudhakar SV, Thomas M, et al. Revisiting Magnetic Resonance Imaging Pattern of Krabbe Disease- Lessons From an Indian Cohort. *J Clin Imaging Sci.* 2019;9: 25. DOI:10.25259/JCIS-18-2019.
12. Kwon JM, Matern D, Kurtzberg J, et al. Consensus Guidelines for Newborn Screening, Diagnosis and Treatment of Infantile Krabbe Disease. *Orphanet J Rare Dis.* 2018;13(1): 30. DOI:10.1186/s13023-018-0766-x.
13. Batla A, Pandey S, Nehru R. Megalencephalic leukoencephalopathy with subcortical cysts: A report of four cases. *J Pediatr Neurosci.* 2011;6(1): 74-77. DOI:10.4103/1817-1745.84416.
14. Dash PK, Raj DH, Sahu H. Megalencephalic Leucoencephalopathy With Subcortical Cysts: Subcortical Diffuse Leucoencephalopathy Associated With White Matter Cystic Degeneration. *BMJ Case Rep.* 2015;2015: bcr2015211921. DOI:10.1136/bcr-2015-211921.

BÖLÜM 11

NÖRODEJENERATİF HASTALIKLAR

Yusuf CAN[1]

Vaka 1: Alzheimer Hastalığı (AH)

Vaka 2: Multipl beyaz cevher iskemileri, kronik laküner iskemi odakları ve bununla ilişkili vasküler demans

Vaka 3: Huntington hastalığı

Vaka 4: Creutzfeldt-Jacob hastalığı

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En yaygın görüntüleme bulgusu tipik olarak frontal, temporal ve parietal loblarda hızlı ilerleyici atrofi görülmesidir. Nadir tiplerde oksipital (Heidenhain varyantı) ve serebellar (Oppenheimer-Brownell varyantı) hemisferlerde atrofi görülebilir (19, 20). Bunun yanında diğer spesifik görüntüleme bulgularından ilki, talamik pulvinarlarda difüzyon kısıtlanması, ikincisi talamik pulvinarlar ve dorsomedial talamuslarda T2 sinyal artışına bağlı 'hokey sopası' görünümünün olmasıdır (21). Diğer nadir bulgular ise serebral kortekslerde yamalı giriform T2 hiperintensitesi ve globus palliduslarda T1 sinyal artışı olmasıdır (22).

FDG PET/BT'de klasik bir görünüm tanımlanmamıştır.

Amiloid PET incelemede amiloid depozisyonu görülmez (16).

Tuzaklar

FDG PET/BT görüntüleme bulgusu olmasa da bazı olgularda Kortikobazal dejenerasyon ve Lewy cisimcikli demans yanlış tanısına neden olabilecek fokal hipometabolizma görülebilir. Bu olgularda klinik ve görüntülemede hızlı progresyon olması CJH lehine tanı koydurur (16).

Tedavi ve Yaklaşım

Günümüzde küratif tedavi yöntemi yoktur. Olguların çoğunda ortalama 7 aylık yaşam beklentisi olan ölümcül bir hastalıktır.

Anahtar Kelimeler

Demans, nörodejeneratif, beyin, MRG, amiloid görüntüleme, FDG PET/BT, medial temporal lob atrofisi, Alzheimer, lewy cisimciği, vasküler demans, huntington, Creutzfeldt-Jacob hastalığı, prion hastalığı,

KAYNAKÇA

1. Geldmacher DS, Whitehouse PJ, Jr. Differential diagnosis of Alzheimer's disease. *Neurology*. 1997;48(5 Suppl 6):S2-9.
2. Martin-Macintosh EL, Broski SM, Johnson GB, et al. Multimodality Imaging of Neurodegenerative Processes: Part 1, The Basics and Common Dementias. *AJR American Journal of Roentgenology*. 2016;207(4):871-82.
3. Gauthier S, Reisberg B, Zaudig M, et al. Mild cognitive impairment. *The Lancet*. 2006;367(9518):1262-70.
4. Scheltens P, Launer LJ, Barkhof F, et al. Visual assessment of medial temporal lobe atrophy on magnetic resonance imaging: interobserver reliability. *Journal of Neurology*. 1995;242(9):557-60.
5. Vernooij MW, Smits M. Structural neuroimaging in aging and Alzheimer's disease. *Neuroimaging Clinics of North America*. 2012;22(1):33-55, vii-viii.
6. Landau SM, Harvey D, Madison CM, et al. Associations between cognitive, functional, and FDG-PET measures of decline in AD and MCI. *Neurobiology of Aging*. 2011;32(7):1207-18.
7. Wolk DA, Price JC, Saxton JA, et al. Amyloid imaging in mild cognitive impairment subtypes. *Annals of Neurology*. 2009;65(5):557-68.

8. Miller-Thomas MM, Sipe AL, Benzinger TL, et al. Multimodality Review of Amyloid-related Diseases of the Central Nervous System. *Radiographics : A Review Publication of the Radiological Society of North America, Inc*. 2016;36(4):1147-63.
9. Galton CJ, Patterson K, Xuereb JH, et al. Atypical and typical presentations of Alzheimer's disease: a clinical, neuropsychological, neuroimaging and pathological study of 13 cases. *Brain*. 2000;123(3):484-98.
10. Prins ND, Scheltens P. White matter hyperintensities, cognitive impairment and dementia: an update. *Nature Reviews Neurology*. 2015;11(3):157-65.
11. Bhogal P, Mahoney C, Graeme-Baker S, et al. The common dementias: a pictorial review. *European Radiology*. 2013;23(12):3405-17.
12. Ballard CG, Burton EJ, Barber R, et al. NINDS AIREN neuroimaging criteria do not distinguish stroke patients with and without dementia. *Neurology*. 2004;63(6):983-8.
13. Gurol ME, Viswanathan A, Gidicsin C, et al. Cerebral amyloid angiopathy burden associated with leukoaraiosis: a positron emission tomography/magnetic resonance imaging study. *Annals of Neurology*. 2013;73(4):529-36.
14. Roman G, Pascual B. Contribution of neuroimaging to the diagnosis of Alzheimer's disease and vascular dementia. *Archives of Medical Research*. 2012;43(8):671-6.
15. Martin-Macintosh EL, Broski SM, Johnson GB, et al. Multimodality Imaging of Neurodegenerative Processes: Part 2, Atypical Dementias. *AJR American Journal of Roentgenology*. 2016;207(4):883-95.
16. Macerollo A, Perry R, Stamelou M, et al. Susceptibility-weighted imaging changes suggesting brain iron accumulation in Huntington's disease: an epiphenomenon which causes diagnostic difficulty. *European Journal of Neurology*. 2014;21(2):e16-7.
17. Comunale JP, Jr., Heier LA, et al. Juvenile form of Huntington's disease: MR imaging appearance. *AJR American Journal of Roentgenology*. 1995;165(2):414-5.
18. Ho VB, Chuang HS, Rovira MJ, et al. Juvenile Huntington disease: CT and MR features. *AJNR American Journal of Neuroradiology*. 1995;16(7):1405-12.
19. Appleby BS, Appleby KK, Crain BJ, et al. Characteristics of established and proposed sporadic Creutzfeldt-Jakob disease variants. *Archives of Neurology*. 2009;66(2):208-15.
20. Kropp S, Schulz-Schaeffer WJ, Finkenstaedt M, et al. The Heidenhain variant of Creutzfeldt-Jakob disease. *Archives of Neurology*. 1999;56(1):55-61.
21. Kallenberg K, Schulz-Schaeffer WJ, Jastrow U, et al. Creutzfeldt-Jakob disease: comparative analysis of MR imaging sequences. *AJNR American Journal of Neuroradiology*. 2006;27(7):1459-62.
22. Caobelli F, Cobelli M, Pizzocaro C, et al. The role of neuroimaging in evaluating patients affected by Creutzfeldt-Jakob disease: a systematic review of the literature. *Journal of Neuroimaging : Official Journal of the American Society of Neuroimaging*. 2015;25(1):2-13.

BÖLÜM 12

BAŞ BOYUN ENFEKSİYON VE İNFLAMASYONLARI

Cansu ÖZTÜRK[1]

Vaka 1: Retrofarengeal apse

Vaka 2: Süpüratif lenfadenit (intranodal apse), retrofarengeal ödem

Vaka 3: Mastoidit+serebellar apse

Vaka 4: Peritonsiller apse

Vaka 5: Tüberküloz (tbc) menenjit+tüberkülom

Vaka 6: Sol parotis gland; akut süpüratif parotitis

Vaka 7: Sağ submandibuler gland; sialolitiazis+sialoadenit

Vaka 8: Ludwig angina+boyun sağ yarı flegmon+apse

Vaka 9: Lakrimal gland psödotümör/idiopatik orbital enflamasyonu

Vaka 10: Akut serebellit

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Tuzaklar

Akut serebellit olgularının ilk başvuruları acil servislere olmaktadır, bu nedenle karşımıza öncelikle beyin BT ile gelmeleri mümkündür. Her ne kadar beyin BT'de ışın sertleşme artefaktları nedeniyle posterior fossa değerlendirilmesi güç olsa da serebellar hipodansite varlığı uyarıcı olmalıdır.

Tedavi ve yaklaşım

Çoğunlukla kendi kendini sınırlayan bir durumdur, tedavi için konsensusa varılmış bir protokol yoktur, etiyoloji ve kafa içi basınç artışına yönelik tedaviler uygulanır. Bu amaçla; steroid, mannitol ve antiviral/antibiyotik tedavisi verilebilir. Komplike olgularda (hidrosefali, tonsiller herniasyon vb.) cerrahi dekompresyon ve drenaj gerekebilir.

KAYNAKÇA

1. Hoang JK, Branstetter BF 4th, Eastwood JD, et al. Multiplanar CT and MRI of collections in the retropharyngeal space: is it an abscess?. *AJR Am J Roentgenol.* 2011;196(4):W426-W432. doi:10.2214/AJR.10.5116.
2. Kamalian S, Avery L, Lev MH, et al. Nontraumatic Head and Neck Emergencies. *Radiographics.* 2019;39(6):1808-1823. doi:10.1148/rg.2019190159
3. Shefelbine SE, Mancuso AA, Gajewski BJ, et al. Pediatric retropharyngeal lymphadenitis: differentiation from retropharyngeal abscess and treatment implications. *Otolaryngol Head Neck Surg.* 2007;136(2): 182-188. doi: 10.1016/j.otohns.2006.03.002.
4. Hakim A, Oertel M, Wiest R. Pyogenic brain abscess with atypical features resembling glioblastoma in advanced MRI imaging. *Radiol Case Rep*. 2017;12(2):365-370. doi:10.1016/j.radcr. 2016.12.007
5. Capps EF, Kinsella JJ, Gupta M, et al. Emergency imaging assessment of acute, nontraumatic conditions of the head and neck. *Radiographics* 2010;30(5):1335-1352. doi:10.1148/rg.305105040
6. Khatri GD, Krishnan V, Antil N, et al. Magnetic resonance imaging spectrum of intracranial tubercular lesions: one disease, many faces. *Pol J Radiol.* 2018; 83: e524-e535. doi:10.5114/pjr.2018.81408
7. Andronikou S, Smith B, Hatherhill M, et al. Definitive neuroradiological diagnostic features of tuberculous meningitis in children. *Pediatr Radiol.* 2004;34(11):876-885. doi:10.1007/s00247-004-1237-1
8. Uysal G, Köse G, Güven A, et al. Magnetic resonance imaging in diagnosis of childhood central nervous system tuberculosis. *Infection*. 2001;29(3):148-153. doi:10.1007/s15010-001-2014-9
9. Schaller MA, Wicke F, Foerch C, et al. Central Nervous System Tuberculosis: Etiology, Clinical Manifestations and Neuroradiological Features. *Clin Neuroradiol.* 2019;29(1):3-18. doi:10.1007/s00062-018-0726-9
10. Gadodia A, Bhalla AS, Sharma R, et al. Bilateral parotid swelling: a radiological review. *Dentomaxillofac Radiol.* 2011;40(7):403-414. doi:10.1259/dmfr/17889378
11. Madani G, Beale T. Inflammatory conditions of the salivary glands. *Semin Ultrasound CT MR.* 2006;27(6):440-451. doi:10.1053/j.sult.2006.09.005
12. Cunqueiro A, Gomes WA, Lee P, et al. CT of the Neck: Image Analysis and Reporting in the Emergency Setting. *Radiographics.* 2019;39(6):1760-1781. doi:10.1148/rg.2019190012
13. Brucker JL, Gentry LR. Imaging of head and neck emergencies. *Radiol Clin North Am.* 2015;53(1):215-252. doi:10.1016/j.rcl.2014.09.007
14. La'porte SJ, Juttla JK, Lingam RK. Imaging the floor of the mouth and the sublingual space. *Radiographics. 2011;31(5):1215-1230.* doi:10.1148/rg.315105062
15. Marchal F, Dulguerov P. Sialolithiasis management: the state of the art. *Arch Otolaryngol Head Neck Surg. 2003;129(9):951-956.* doi:10.1001/archotol.129.9.951
16. Kubal, Wayne Scott. Face and Neck Infections: What the Emergency Radiologist Needs to Know. *Radiol Clin North Am.* 2015;53(4):827-846. doi:10.1016/j.rcl.2015.02.007
17. Pakdaman, Michael N., Sepahdari AR. et al. Orbital inflammatory disease: Pictorial review and differential diagnosis. *World J Radiol.* 2014;6(4):106-115. doi:10.4329/wjr.v6.i4.106

18. Sepahdari AR, Aakalu VK, Setabutr P, et al. Indeterminate orbital masses: restricted diffusion at MR imaging with echo-planar diffusion-weighted imaging predicts malignancy. *Radiology*. 2010;256(2):554-564. doi:10.1148/radiol.10091956
19. Politi LS, Forghani R, Godi C, et al. Ocular adnexal lymphoma: diffusion-weighted mr imaging for differential diagnosis and therapeutic monitoring. *Radiology*. 2010;256(2):565-574. doi:10.1148/radiol.10100086
20. Kornreich L, Shkalim-Zemer V, Levinsky Y, et al. Acute Cerebellitis in Children: A Many-Faceted Disease. *J Child Neurol.* 2016;31(8):991-997. doi:10.1177/0883073816634860
21. Lancella L, Esposito S, Galli ML, et al. Acute cerebellitis in children: an eleven year retrospective multicentric study in Italy. *Ital J Pediatr*. 2017;43(1):54. doi:10.1186/s13052-017-0370-z

BÖLÜM 13

EKSTRAAKSİYEL TÜMÖRLER

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Tedavi ve yaklaşım

Karakteristik özellikleri rezeksiyonunu zorlaştırmaktadır. Total rezeksiyon postoperatif aseptik menenjit, hidrosefali ve tümör rekürrensi riskini etmesine rağmen agresif cerrahi kraniyal sinir ya da iskemik defisitler ile ilişkili olabilir.

KAYNAKÇA

1. Buetow MP, Buetow PC, Smirniotopoulos JG. Typical, atypical, and misleading features in meningioma. *Radiographics* 1991; 11: 1087-106.
2. Toh CH, Castillo M, Wong AM. Differentiation between classic and atypical meningiomas with use of diffusion tensor imaging. *AJNR Am J Neuroradiol* 2008; 29: 1630-5.
3. Louis DN, Perry A, Reifenberger G. The 2016 World Health Organization Classification of Tumors of the Central Nervous System: a summary. *Acta Neuropathol*. 2016 Jun;131(6):803-20.
4. O'Leary S, Adams WM, Parrish RW. Atypical imaging appearances of intracranial meningiomas. *Clin Radiol* 2007; 62: 10-7.
5. Tokgoz N, Oner YA, Kaymaz M. Primary intraosseous meningioma: CT and MRI appearance. *AJNR Am J Neuroradiol* 2005; 26: 2053-56.
6. Saloner D, Uzelac A, Hetts S. Modern meningioma imaging techniques. *J Neurooncol* 2010; 99: 333-40.
7. Osawa T, Tosaka M, Nagaishi M. Factors affecting peritumoral brain edema in meningioma: special histological subtypes with prominently extensive edema. *J Neurooncol* 2013; 111: 49-57.
8. Yue Q, Isobe T, Shibata Y. New observations concerning the interpretation of magnetic resonance spectroscopy of meningioma. *Eur Radiol* 2008; 18: 2901-11.
9. Majós C, Alonso J, Aguilera C. Utility of proton MR spectroscopy in the diagnosis of radiologically atypical intracranial meningiomas. *Neuroradiology* 2003; 45: 129-36.
10. Zhang H, Rödiger LA, Shen T. Perfusion MR imaging for differentiation of benign and malignant meningiomas. *Neuroradiology* 2008; 50: 525-30.
11. Hakyemez B, Yildirim N, Erdogan C. Meningiomas with conventional MRI findings resembling intraaxial tumors: can perfusion-weighted MRI be helpful in differentiation? *Neuroradiology* 2006; 48: 695-702.
12. Osborn AG. Tumor of the meninges. In: *Osborn's brain imaging, pathology, and anatomy*. Altona, Manitoba: Amirsys; 2013. p.583-95.
13. Grossman SA, Krabak MJ. Leptomeningeal carcinomatosis. *Cancer Treat Rev* 1999; 25: 103-19.
14. Clarke JL, Perez HR, Jacks LM. Leptomeningeal metastases in the MRI era. *Neurology* 2010; 74: 1449-54.
15. Altundag K, Bondy ML, Mirza NQ. Clinicopathologic characteristics and prognostic factors in 420 metastatic breast cancer patients with central nervous system metastasis. *Cancer* 2007; 110: 2640-7.
16. Hukin J, Siffert J, Cohen H. Leptomeningeal dissemination at diagnosis of pediatric low-grade neuroepithelial tumors. *Neuro Oncol.* 2003; 5: 188-96.
17. Guermazi A, Lafitte F, Miaux Y. The dural tail sign--beyond meningioma. *Clin Radiol* 2005; 60: 171-88.
18. Drevelegas A. Extra-axial brain tumors. *Eur Radiol* 2005; 15: 453-67.
19. Topcu Çakır B, Tekşam M. Ekstraaksiyel beyin tümörleri. *Trd Sem 2016*; 4: 82-120
20. Bonneville F, Savatovsky J, Chiras J. Imaging of cerebellopontine angle lesions: an update. part 1: enhancing extra-axial lesions. *Eur Radiol* 2007; 17: 2472-82.
21. Duvoisin B, Fernandes J, Doyon D. Magnetic resonance findings in 92 acoustic neuromas. *Eur J Radiol* 1991; 13: 96-102.
22. Sriskandan N, Connor SE. The role of radiology in the diagnosis and management of vestibular schwannoma. *Clin Radiol* 2011; 66: 357-65.
23. Paz-Fumagalli R, Daniels DL, Millen SJ. Dural "tail" associated with an acoustic schwannoma in MR imaging with gadopentetate dimeglumine. *AJNR Am J Neuroradiol* 1991; 12: 1206.
24. Kennedy RJ, Shelton C, Salzman KL . Intralabyrinthine schwannomas: diagnosis, management, and a new classification system. *Otol Neurotol* 2004; 25: 160-7.
25. Sharma BS, Ahmad FU, Chandra PS. Trigeminal schwannomas: experience with 68 cases. *J Clin Neurosci*. 2008, 15(7):738-43.
26. Moffat D, De R, Hardy D. Surgical management of trigeminal neuromas: a report of eight cases. J Laryngol Otol 2006, 120(8); 631-37
27. Stone JA, Cooper U, Castillo M. Malignant Schwannoma of the Trigeminal nerve *AJNR* 2001; 22: 505-7.
28. Guthrie BL, Ebersold MJ, Scheithauer BW. Meningeal hemangiopericytoma: histopathological features,

treatment, and long-term follow-up of 44 cases. *Neurosurgery* 1989; 25: 514-22.
29. Mena H, Ribas JL, Pezeshkpour GH. Hemangiopericytoma of the central nervous system: a review of 94 cases. *Hum Pathol* 1991; 22: 84-91.
30. Fountas KN, Kapsalaki E, Kassam M. Management of intracranial meningeal hemangiopericytomas: outcome and experience. *Neurosurg Rev* 2006; 29: 145-53.
31. Chiechi MV, Smirniotopoulos JG, Mena H. Intracranial haemangiopericytomas: MR and CT features. *AJNR* 1996; 17: 1365-371.
32. Oprişan A, Popescu BO. Intracranial cysts: An imagery diagnostic challenge. *Sci World J* 2013; 2013:172154.
33. Chen CY, Wong JS, Hsieh SC. Intracranial epidermoid cyst with hemorrhage: MR imaging findings. *AJNR Am J Neuroradiol* 2006;27: 427-9.

BÖLÜM 14

İNTRAAKSİYEL SUPRATENTORİAL TÜMÖRLER

Ali Murat KOÇ[1]

Vaka 1: Glioblastom, NSO, DSÖ Evre 4

Vaka 2: Adenokarsinom metastazı

Vaka 3: Difüz Büyük B Hücreli Lenfoma (Primer Santral Sinir Sistemi Lenfoması)

Vaka 4: Oligodendrogliom, NOS, DSÖ Evre II

Vaka 5: Disembriyoplastik Nöroepitelyal Tümör (DNET) ve Fokal kortikal displazi (FCD)

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Tedavi ve yaklaşım

DNET tedavisinin temel amacı epileptik ataklar ve bunların neden olduğu hasarı önlemektir. Tedavide seçenek cerrahi eksizyon olup, cerrahi tedavi kararı hastanın kliniğine göre verilir. Cerrahi yapılması planlanan olgularda, eşlik edebilecek kortikal displazilerin de değerlendirilmesi tedavi sonrasında ataksız bir yaşam için önem arz etmektedir.(15)

KAYNAKÇA

1. Osborn, A. (2017). *Osborn's Brain* (2nd edition). Elsevier.
2. Chen R, Smith-Cohn M, Cohen AL, et al. Glioma Subclassifications and Their Clinical Significance. *Neurotherapeutics*. 2017;14(2):284-97. Epub 2017/03/11. doi: 10.1007/s13311-017-0519-x. PubMed PMID: 28281173; PMCID: PMC5398991.
3. Louis DN, Perry A, Reifenberger G, et al. The 2016 World Health Organization Classification of Tumors of the Central Nervous System: a summary. Acta Neuropathol. 2016;131(6):803-20. Epub 2016/05/10. doi: 10.1007/s00401-016-1545-1. PubMed PMID: 27157931.
4. Chaumeil MM, Lupo JM, Ronen SM. Magnetic Resonance (MR) Metabolic Imaging in Glioma. *Brain Pathol*. 2015;25(6):769-80. Epub 2015/11/04. doi: 10.1111/bpa.12310. PubMed PMID: 26526945.
5. Smits M, van den Bent MJ. Imaging Correlates of Adult Glioma Genotypes. *Radiology*. 2017;284(2):316-31. Epub 2017/07/21. doi: 10.1148/radiol.2017151930. PubMed PMID: 28723281.
6. van den Bent MJ. Chemotherapy for low-grade glioma: when, for whom, which regimen? *Curr Opin Neurol*. 2015;28(6):633-938. Epub 2015/09/24. doi: 10.1097/WCO.0000000000000257. PubMed PMID: 26397230.
7. Pope WB. Brain metastases: neuroimaging. *Handbook of clinical neurology*. 2018;149:89-112. Epub 2018/01/09. doi: 10.1016/b978-0-12-811161-1.00007-4. PubMed PMID: 29307364; PMCID: PMC6118134.
8. Muccio CF, Tedeschi E, Ugga L, Cuocolo R, Esposito G, Caranci F. Solitary Cerebral Metastases vs. High-grade Gliomas: Usefulness of Two MRI Signs in the Differential Diagnosis. *Anticancer Res*. 2019;39(9):4905-9. Epub 2019/09/15. doi: 10.21873/anticanres.13677. PubMed PMID: 31519594.
9. Lin X, DeAngelis LM. Treatment of Brain Metastases. *J Clin Oncol.* 2015;33(30):3475-84. Epub 2015/08/19. doi: 10.1200/JCO.2015.60.9503. PubMed PMID: 26282648; PMCID: PMC5087313 online at www.jco.org. Author contributions are found at the end of this article.
10. Brandao LA, Castillo M. Lymphomas-Part 1. *Neuroimaging clinics of North America*. 2016;26(4):511-36. Epub 2016/10/08. doi: 10.1016/j.nic.2016.06.004. PubMed PMID: 27712792.
11. von Baumgarten L, Illerhaus G, Korfel A, Schlegel U, Deckert M, Dreyling M. The Diagnosis and Treatment of Primary CNS Lymphoma. *Deutsches Arzteblatt international*. 2018;115(25):419-26. Epub 2018/07/13. doi: 10.3238/arztebl.2018.0419. PubMed PMID: 29999484; PMCID: PMC6056710.
12. Smits M. Imaging of oligodendroglioma. *Br J Radiol*. 2016;89(1060):20150857. Epub 2016/02/06. doi: 10.1259/bjr.20150857. PubMed PMID: 26849038; PMCID: PMC4846213.
13. Koeller KK, Rushing EJ. From the archives of the AFIP: Oligodendroglioma and its variants: radiologic-pathologic correlation. *Radiographics* : a review publication of the Radiological Society of North America, Inc. 2005;25(6):1669-88. Epub 2005/11/15. doi: 10.1148/rg.256055137. PubMed PMID: 16284142.
14. Johnson DR, Diehn FE, Giannini C, Jenkins RB, Jenkins SM, Parney IF, Kaufmann TJ. Genetically Defined Oligodendroglioma Is Characterized by Indistinct Tumor Borders at MRI. *American Journal of Neuroradiology.* 2017;38(4):678-84. doi: 10.3174/ajnr.A5070.
15. Isler C, Erturk Cetin O, Ugurlar D, et al. Dysembryoplastic neuroepithelial tumours: clinical, radiological, pathological features and outcome. Br J Neurosurg. 2018;32(4):436-41. Epub 2018/05/25. doi: 10.1080/02688697.2018.1476671. PubMed PMID: 29792345.

BÖLÜM 15

İNTRAAKSİYEL İNFRATENTORİAL BÖLGE TÜMÖRLERİ

Ezel YALTIRIK BİLGİN[1]

Vaka 1: Medulloblastom.

Vaka 2: Pilositik astrositom

Vaka 3: Hemanjioblastom

Vaka 4: Ependimom

Vaka 5: Orta hat gliomu

Vaka 6: Akciğer küçük hücreli karsinomu, soliter beyin metastazı

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KAYNAKÇA

1. D'Arco F, Khan F, Mankad K et al. Differential diagnosis of posterior fossa tumours in children: new insights. *Pediatric Radiology.* 2018;48: 1955-1963.
2. Raaf J, Kernohan JW, Relation of abnormal collections of cells in posterior medullary velum of cerebellum to origin of medulloblastoma. *Archives of Neurology & Psychiatry*. 1944;52: 163–169.
3. Osborn AG. *Diagnostic Imaging: BRAIN* (first edition). Utah: Amirsys.2004. (pp:6:92-96).
4. Smoll NR, Drummond J. The incidence of medulloblastomas and primitive neurectodermal tumours in adults and children. *Journal of Clinical Neuroscience*. 2012;19: 1541–1544.
5. Kool M, Korshunov A, Remke M et al. Molecular subgroups of medulloblastoma: an international meta-analysis of transcriptome, genetic aberrations, and clinical data of WNT, SHH, Group 3, and Group 4 medulloblastomas. *Acta Neuropathol*. 2012;123: 473-484.
6. DeSouza RM, Jones BR, Lowis SP et-al. Pediatric medulloblastoma - update on molecular classification driving targeted therapies. *Front Oncol*. 2014;4: 176.
7. Majós C, Alonso J, Aguilera C, et al. Adult primitive neuroectodermal tumor: Proton MR spectroscopic findings with possible application for differential diagnosis. *Radiology.* 2002;225: 556–566.
8. Moreno-Torres A, Martínez-Pérez I, Baquero M, et al. Taurine detection by proton magnetic resonance spectroscopy in medulloblastoma: Contribution to noninvasive differential diagnosis with cerebellar astrocytoma. *Neurosurgery.* 2004;55: 824-829.
9. AlRayahi J, Zapotocky M, Ramaswamy V, et al. Pediatric Brain Tumor Genetics: What Radiologists Need to Know. *Radiographics.* 2018;38: 2102-2122.
10. Koeller KK, Rushing EJ. From the archives of the AFIP: pilocytic astrocytoma: radiologic-pathologic correlation. *Radiographics*. 2004;24: 1693-1708.
11. Theeler BJ, Ellezam B, Sadighi ZS, et al. Adult pilocytic astrocytomas: clinical features and molecular analysis. *Neuro Oncol*. 2014;16(6): 841–847.
12. Listernick R, Louis DN, Packer RJ, et al. Opticpathway gliomas in children with neurofibromatosis 1:Consensus statement from the NF 1 Optic Pathway GliomaTask Force. *Ann Neurol.* 1997;41: 143-149.
13. Beni-Adani L, Gomori M, Spektor S, et al. Cyst Wall Enhancement in Pilocytic Astrocytoma: Neoplastic or Reactive Phenomena. *Pediatr Neurosurg.* 2000;32: 234-239.
14. Albers AC, Gutmann DH. Gliomas in patients with neurofibromatosis type 1. *Expert Rev Neurother.* 2009;9: 535-539.
15. Abdollahzadeh M, Hoffman HJ, Blazer SI, et al. Benign cerebellar astrocytoma in childhood: Experience at the Hospital for Sick Children 1980-1992. *Childs Nerv Syst.* 1994;10: 380-383.
16. Farrukh HM. Cerebellar hemangioblastoma presenting as secondary erythrocytosis and aspiration pneumonia. *West. J. Med*. 1996;164(2): 169-171.
17. Sun L, Heng L, Wuchao L, et al. CT and MRI Features of a Solid Hemangioblastoma of Cerebellar Vermis in a Child: A Case Report. *Journal of Pediatric Neuroradiology*. 2015;4: 19-23.
18. Slater A, NialL M, Huson S. The Natural History of Cerebellar Hemangioblastomas in von Hippel-Lindau Disease. *American Journal of Neuroradiology* 2003;24(8):1570-1574.
19. Choyke PL, Glenn GM, Walther MM, et al. Von Hippel-Lindau disease: genetic, clinical and imaging features. *Radiology* 1995;194: 629–642.
20. Lee SR, Sanches J, Mark AS, et al. Posterior fossa hemangioblastomas: MR imaging. *Radiology.* 1989;171: 463–468.
21. Ho VB, Smirniotopoulos JG, Murphy FM, et al. Radiologic-pathologic correlation: hemangioblastoma. *Am J Neuroradiol*. 1992;13: 1343-1352.
22. Cervio A, Villalonga JF, Mormandi R, et al. Surgical treatment of cerebellar hemangioblastomas. *Surg Neurol Int.* 2017;8: 163.
23. Grossman R.I. *Neuroradiology requisites.* (Sekond edit). Philadelphia: ELSEVIER.2003.
24. Yuh EL, Barkovich AJ, Gupta N. Imaging of ependymomas: MRI and CT. *Childs Nerv Syst.* 2009;25(10):1203–1213.
25. Ambekar S, Ranjan M, Prasad C, et al. Fourth ventricular ependymoma with a distant intraventricular metastasis: Report of a rare case. *J Neurosci Rural Pract*. 2013;4: 121–124.
26. Smith A, Smirniotopoulos J, Horkanyne-Szakaly I. From the Radiologic Pathology Archives: Intraventricular Neoplasms: Radiologic-Pathologic Correlation. *Radiographics*. 2013;33 (1): 21-43.
27. Duffner PK, Krischer JP, Sanford RA, et al. Prognostic factors in infantsand very young children with intracranial ependymomas. *Pediatr Neurosurg*. 1998;28(4): 215-222.
28. Quattrocchi CC, Errante Y, Rossi Espagnet MC, et al. Magnetic resonance imaging differential diagnosis of brainstem lesions in children. *World J Radiol*. 2016;8(1):1–20.
29. Paci M, Wein TH, Bekhor S. An unusual case of retro-orbitalpain with diplopia. *Can J Neurol Sci* 2010;37:

888-889.
30. Yu D, Han G, Liu H, et al. Treatment of adult brainstem glioma with combined antiangiogenic therapy: a case report and literature review. *Onco Targets Ther*. 2019;12: 1333–1339.
31. Louis DN, Perry A, Reifenberger G, et al. The 2016 World Health Organization Classification of Tumors of the Central Nervous System: a summary. *Acta Neuropathol*. 2016;131 (6): 803-820.
32. Aboian MS, Solomon DA, Felton E, et al. Imaging Characteristics of Pediatric Diffuse Midline Gliomas with Histone H3 K27M Mutation. *American Journal of Neuroradiology.* 2017; 38 (4): 795-800.
33. Jennings MT, Sposto R, Boyett JM, et al. Preradiation chemotherapy in primary high-risk brainstem tumors: phase II study CCG-9941 of the Children's Cancer Group. *J Clin Oncol.* 2002;20(16): 3431-3437.
34. Bertolini F, Spallanzani A, Fontana A, et al. Brain metastases: an overview. *CNS Oncol*. 2015;4(1): 37–46.
35. Fink KR, Fink JR. Imaging of brain metastases. *Surg Neurol Int.* 2013;4: 209–219.
36. Arnold SM, Patchell RA. Diagnosis and management of brain metastases. Hematol. *Oncol. Clin. N. Am*. 2001;15(6):1085–1107.
37. Schellinger PD, Meinck HM, Thron A. Diagnostic accuracy of MRI compared with CCT in patients with brain metastases. *J. Neurooncol*. 1999;44(3): 275–281.
38. Sealy RC. Radicals in melanin biochemistry. *Meth. Enzymol*. 1984;105: 479-483.
39. Pope WB. Brain metastases: neuroimaging. *Handb Clin Neurol*. 2018;149: 89–112.
40. Tsougos I, Svolos P, Kousi E et al. Differentiation of glioblastoma multiforme from metastatic brain tumor using proton magnetic resonance spectroscopy, diffusion and perfusion metrics at 3 T. *Cancer Imaging.* 2012;12: 423–436.
41. Lin X, DeAngelis LM. Treatment of Brain Metastases. *J Clin Oncol.* 2015;33: 3475–3484.

BÖLÜM 16

TEDAVİYE İKİNCİL DEĞİŞİKLİKLER

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Tedavi ve yaklaşım

OHSS sekonder enfarkt etiyolojisine göre tedavi planlaması yapılır. Venöz tromboza bağlı bir durum varsa antikoagülan tedavi hemen başlanılmadır. Arteriyel kaynaklı enfarkt var ise trombolitik tedavi başlanılmalıdır.

KAYNAKÇA

1. Kessler AT, Bhatt AAJIii. Brain tumour post-treatment imaging and treatment-related complications. *Insights into Imaging* 2018;9(6):1057-1075.
2. Sarbu N, Shih RY, Jones RV, et al. White matter diseases with radiologic-pathologic correlation. *RadioGraphics* 2016;36(5):1426-1447.
3. McTyre E, Scott J, Chinnaiyan P.Whole brain radiotherapy for brain metastasis. *Surgical neurology international*. 2013;4(Suppl 4):S236-244.
4. Ebi J, Sato H, Nakajima M,et al.Incidence of leukoencephalopathy after whole-brain radiation therapy for brain metastases. *Int J Radiat Oncol Biol Phys*. 2013;85(5):1212-1217.
5. Cummings M, Dougherty DW, Mohile NA, et al. Severe radiation-induced leukoencephalopathy: Case report and literature review *Adv Radiat Oncol.* 2016;1(1):17-20.
6. Valk PE, Dillon WP. Radiation injury of the brain. *Am J Neuroradiol.*1991;12(1):45-62.
7. Shah R, Vattoth S, Jacob R, et al. Radiation necrosis in the brain: imaging features and differentiation from tumor recurrence. *Radiographics* 2012;32(5):1343-1359.
8. Kessler AT, Bhatt AA. Brain tumour post-treatment imaging and treatment-related complications. *Insights into imaging*. 2018;9(6):1057-1075.
9. Wang LL, Leach JL, Breneman JC, et al. Critical role of imaging in the neurosurgical and radiotherapeutic management of brain tumors. *Radiographics*, 2014;34(3):702-721.
10. Kumar AJ, Leeds NE, Fuller GN, et al. Malignant gliomas: MR imaging spectrum of radiation therapy- and chemotherapy-induced necrosis of the brain after treatment. *Radiology.* 2000;217(2):377-384.
11. Mullins ME, Barest GD, Schaefer PW, et al. Radiation necrosis versus glioma recurrence: conventional MR imaging clues to diagnosis. Am J *Neuroradiol.* 2005;26(8):1967-1972.
12. Deuschl C, Kirchner J, Poeppel TD,et al. (11)C-MET PET/MRI for detection of recurrent glioma. *Eur J Nucl Med Mol Imaging* 2018;45(4):593-601.
13. Siu A, Wind JJ, Iorgulescu JB, et al.Radiation necrosis following treatment of high grade glioma--a review of the literature and current understanding. *Acta Neurochirurgica.* 2012;154(2):191-201
14. Chakravarti A, Erkkinen MG, Nestler U, et al. Temozolomide-mediated radiation enhancement in glioblastoma: a report on underlying mechanisms. *Clinical Cancer Research*. 2006;12(15):4738-4746.
15. Hygino da Cruz LC, Jr., Rodriguez I, Domingues RC, et al. Pseudoprogression and pseudoresponse: imaging challenges in the assessment of posttreatment glioma. *Am J Neuroradiol*. 2011;32(11):1978-1985.
16. Brandsma D, Stalpers L, Taal W, et al.Clinical features, mechanisms, and management of pseudoprogression in malignant gliomas. *The Lancet Oncology.* 2008;9(5):453-461.
17. Brandes AA, Franceschi E, Tosoni A, et al. MGMT promoter methylation status can predict the incidence and outcome of pseudoprogression after concomitant radiochemotherapy in newly diagnosed glioblastoma patients. *Journal Of Clinical Oncology*. 2008;26(13):2192-2197.
18. Brandes AA, Tosoni A, Franceschi E, et al. Recurrence pattern after temozolomide concomitant with and adjuvant to radiotherapy in newly diagnosed patients with glioblastoma: correlation With MGMT promoter methylation status. *Journal Of Clinical Oncology.* 2009;27(8):1275-1279.
19. de Wit MC, de Bruin HG, Eijkenboom W, et al. Immediate post-radiotherapy changes in malignant glioma can mimic tumor progression. *Neurology.* 2004;63(3):535-537.
20. Schlemmer HP, Bachert P, Henze M, et al. Differentiation of radiation necrosis from tumor progression using proton magnetic resonance spectroscopy. *Neuroradiology.* 2002;44(3):216-222.
21. Weybright P, Sundgren PC, Maly P, et al. Differentiation between brain tumor recurrence and radiation injury using MR spectroscopy. *Am J Roentgenol*. 2005;185(6):1471-1476.
22. Leonoudakis D, Braithwaite SP, Beattie MS, et al. TNFalpha-induced AMPA-receptor trafficking in CNS neurons; relevance to excitotoxicity? *Neuron Glia Biology*. 2004;1(3):263-273.
23. Kita T, Tanaka T, Tanaka N, et al. The role of tumor necrosis factor-alpha in diffuse axonal injury following fluid-percussive brain injury in rats. *Int J Legal Med* 2000;113(4):221-228.

24. Prow NA, Irani DN. The inflammatory cytokine, interleukin-1 beta, mediates loss of astroglial glutamate transport and drives excitotoxic motor neuron injury in the spinal cord during acute viral encephalomyelitis. *Journal of neurochemistry.* 2008;105(4):1276-1286.
25. Starkey J, Kobayashi N, Numaguchi Y, et al. Cytotoxic Lesions of the Corpus Callosum That Show Restricted Diffusion: Mechanisms, Causes, and Manifestations. *Radiographics* 2017;37(2):562-576.
26. Galnares-Olalde J, Vázquez-Mézquita A, Gómez-Garza G, et al. Cytotoxic lesions of the corpus callosum caused by thermogenic dietary supplements. *Am J Neuroradiol*. 2019;40(8):1304-1308.
27. Malhotra HS, Garg RK, Vidhate MR, et al. Boomerang sign: Clinical significance of transient lesion in splenium of corpus callosum. *Ann Indian Acad Neurol* 2012;15(2):151-157.
28. Starkey J, Kobayashi N, Numaguchi Y, et al. Cytotoxic lesions of the corpus callosum that show restricted diffusion: mechanisms, causes, and manifestations. *Radiographics*2017;37(2):562-576.
29. Whelan III JG, Vlahos NFJF, sterility. The ovarian hyperstimulation syndrome. *Fertil Steril.* 2000;73(5):883-896.
30. Kaiser UBJNEJoM. The pathogenesis of the ovarian hyperstimulation syndrome. *N Engl J Med* 2003;349(8):729-732.
31. Yang S, Yuan J, Qin W, et al. The Clinical Characteristics of Acute Cerebrovascular Accidents Resulting from Ovarian Hyperstimulation Syndrome. *Eur Neurol* . 2017;77(5-6):221-230.
32. Stewart JA, Hamilton PJ, Murdoch AP. Thromboembolic disease associated with ovarian stimulation and assisted conception techniques. *Human Reproduction* 1997;12(10):2167-2173.

BÖLÜM 17

SİNONAZAL KAVİTE HASTALIKLARI

İsa ÇAM[1]
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Vaka 1: Olfaktör Nöroblastom (Estezionöroblastom)

Vaka 2: Nazoetmoidal ensefalosel

Vaka 3: Paranazal-orbital osteom

Vaka 4: Maksiller sinüs adenokarsinomu

Vaka 5: Akut invaziv fungal sinüzit

Vaka 6: Sinonazal Diffüz Büyük B hücreli lenfoma

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KAYNAKÇA

1. Thompson LD. Olfactory neuroblastoma. *Head Neck Pathol.* 2009;3:252–259.
2. Lund VJ, Howard D, Wei W, Spittle M. Olfactory neuroblastoma: Past, present, and future? *Laryngoscope.* 2003;113:502-527.
3. Derdeyn CP, Moran CJ, Wippold FJ 2nd, et al. MRI of esthesioneuroblastoma. *J Comput Assist Tomogr.* 1994;18:16–21.
4. Regenbogen VS, Zinreich SJ, Kim KS, et al. Hyperosteotic esthesio neuroblastoma: CT and MR findings. *J Comput Assist Tomogr* .1988;12:52–56.
5. Mahapatra AK, Aqrawal D. Anterior Encephaloceles: a series of 103 casesover 32 years. *J ClinNeurosci.* 2006;13:536–539.
6. David DJ. Cephaloceles: classification, pathology, and management-a review. *J Craniofac Surg.* 1993;4:192–202.
7. Dinesh B. Frontal Encephalocele – A Rare Case Report withReview of Literature. *Sch J Med Case Rep.* 2016; 4:822-824.
8. Chahed H, Hachicha H, Bachraoui R, et al. Paranasal sinus osteomas: diagnosis and treatment. *Revue de stomatologie, de chirurgie maxillo-faciale et de chirurgie orale.* 2016;117:306-310.
9. Bhallil S, Qudidi S, Oudidi A Bhallil S, et al. Orbital osteoma: three case reports. *Bull Soc belge Ophtalmol.* 2006;300:73-79.
10. Larrea-Oyarbide N, Valmaseda-Castellón E, Berini-Aytés L, et al. Osteomas of the cranio facial region. Review of 106 cases. *J Oral Pathol Med.* 2008;37:38-42.
11. Nielsen GP, Rosenberg AE. Update on bone forming tumors of the head and neck. *Head and neck pathology.* 2007;1:87-93.
12. Pavel Dulguerova, Abdelkarim S. Allalb. New developments in the nasal and paranasal sinus cancers are reviewed. C*urrent Opinion in Otolaryngology&Head and Neck Surgery.* 2006;14:67-72.
13. Som PM, Brandwein-Gensler MS, Kassel EE, et al. *Tumors and tumor-like conditions of the sinonasal cavities.* In: Curtin DC, editor. Head and neck imaging. 5th edition. St Louis (MO): Mosby; 2011. p. 253–408.
14. Dulguerov P, Jacobsen MS, Allal AS, et al. Nasal and paranasal sinus carcinoma: are we making progress? A series of 220 patients and a systematic review. *Cancer.* 2001;92:3012-3029.
15. Takahashi H, Hinohira Y, Hato N, et al. Clinical features and outcomes of four patients with invasive fungal sinusitis. *Auris Nasus Larynx.* 2011;38:289-294.
16. de Shazo RD, O'Brien M, Chapin K, et al. A new classification and diagnostic criteria for invasive fungal sinusitis. *Arch Otolaryngol Head Neck Surg.* 1997;123:1181-1188.
17. Soler ZM, Schlosser RJ. The role of fungi in diseases of the nose and sinuses. *Am J Rhinol Allergy.* 2012;26:351-358.
18. Valera FC, do Lago T, Tamashiro E, et al. Prognosis of acute invasive fungal rhinosinusitis related to underlying disease. *Int J Infect Dis.* 2011;15:841-844.
19. Gillespie MB, O'Malley BW. An algorithmic approach to the diagnosis and management of invasive fungal rhinosinusitis in the immunocompromised patient. *Otolarygol Clin North Am.* 2000;3:323-334.
20. Cavalot AL, Ricci E, Nazionale G, et al. Primary non- Hodgkin's lymphoma of the nasal cavity. Clinical case report and discussion. *Acta Otolaryngol.* 2000;120:545-550.
21. Quraishi MS, Bessell EM, Clark D, et al. Non- Hodgkin's lymphoma of the sinonasal tract. *Laryngoscope.* 2000; 110:1489-1492.
22. Herd MK. Lymphoma presenting in the neck: current concepts in diagnosis. *Br J Oral Maxillofac Surg.* 2012;50:309-313.
23. Serifoglu İ, Oz İİ, Damar M, et al. Diffusion weigthed imaging in the head and neck region: usefulness of apparent diffusion coefficient values for characterization of lesions. *Diagn Interv Radiol.* 2015;21:208-214.
24. Lu NN, Li YX, Wang WH, et al. Clinical behavior and treatment outcome of primary nasal diffuse large B-cell lymphoma. *Cancer.* 2012;118:1593-1598.

BÖLÜM 18

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KAYNAKÇA

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2. Gao, R., Isoda, H., Tanaka, T. et al. Dynamic gadolinium-enhanced MR imaging of pituitary adenomas: usefulness of sequential sagittal and coronal plane images. *European journal of radiology*, 2001, 39.3: 139-146.
3. Molitch, Mark E. Diagnosis and treatment of pituitary adenomas: a review. *Jama*, 2017, 317.5: 516-524.
4. Micko, A. S., Woehrer, A., Wolfsberger et al. Invasion of the cavernous sinus space in pituitary adenomas: endoscopic verification and its correlation with an MRI-based classification. *Journal of neurosurgery*, 2015, 122.4: 803-811.
5. Osborn AG, Salzman KL, Barkovich AJ. Diagnostic Imaging: Brain. 2nd edition. *Lippincott Williams & Wilkins. (2009)* ISBN:1931884722
6. De Sousa, S. M., Earls, P., & McCormack, A. I. et al. Pituitary hyperplasia: case series and literature review of an under-recognised and heterogeneous condition. *Endocrinology, diabetes & metabolism case reports*, 2015, 2015.1.
7. Ostrov, S. G., Quencer, R. M., Hoffman, J. C., et al. Hemorrhage within pituitary adenomas: how often associated with pituitary apoplexy syndrome?. *American Journal of Roentgenology*, 1989, 153.1: 153-160.
8. Bonneville, F., Cattin, F., Marsot-Dupuch, K., et al. T1 signal hyperintensity in the sellar region: spectrum of findings. *Radiographics*, 2006, 26.1: 93-113.
9. Albani, A., Ferraù, F., Angileri, F., et al. Multidisciplinary management of pituitary apoplexy. *International journal of endocrinology*, 2016, 2016.
10. Byun, W. M., Kim, O. L., & sug Kim, D. MR imaging findings of Rathke's cleft cysts: significance of intracystic nodules. *American Journal of Neuroradiology*, 2000, 21.3: 485-488.
11. Park, M., Lee, S. K., Choi, J. et al. Differentiation between cystic pituitary adenomas and Rathke cleft cysts: a diagnostic model using MRI. *American Journal of Neuroradiology*, 2015, 36.10: 1866-1873.
12. Roelfsema, F., Biermasz, N. R., & Pereira, A. M. Clinical factors involved in the recurrence of pituitary adenomas after surgical remission: a structured review and meta-analysis. *Pituitary*, 2012, 15.1: 71-83.
13. Silbergleit, R., Junck, L., Gebarski, S. et al. Idiopathic intracranial hypertension (pseudotumor cerebri): MR imaging. *Radiology*, 1989, 170.1: 207-209.
14. Jordan, R. M., Kendall, J. W., & Kerber, C. W. The primary empty sella syndrome: analysis of the clinical characteristics, radiographic features, pituitary function and cerebrospinal fluid adenohypophysial hormone concentrations. *The American journal of medicine*, 1977, 62.4: 569-580.
15. Chiloiro, S., Giampietro, A., Bianchi, A. et al. Diagnosis of endocrine disease: primary empty sella: a comprehensive review. *European journal of endocrinology*, 2017, 177.6: R275-R285.
16. Razek, A. A., & Castillo, M. Imaging lesions of the cavernous sinus. *American journal of neuroradiology*, 2009, 30.3: 444-452.
17. Watts, J., Box, G., Galvin, A. et al. Magnetic resonance imaging of meningiomas: a pictorial review. *Insights into imaging*, 2014, 5.1: 113-122.
18. Pichierri, A., Santoro, A., Raco, A. et al. Cavernous sinus meningiomas: retrospective analysis and proposal of a treatment algorithm. *Neurosurgery*, 2009, 64.6: 1090-1101.
19. Hoffman, H. J. Surgical management of craniopharyngioma. *Pediatric neurosurgery*, 1994, 21.Suppl. 1: 44-49.
20. Zada, G., Lin, N., Ojerholm, E. et al. Craniopharyngioma and other cystic epithelial lesions of the sellar region: a review of clinical, imaging, and histopathological relationships. *Neurosurgical Focus*, 2010, 28.4: E4.
21. Garrè, M. L., & Cama, A. Craniopharyngioma: modern concepts in pathogenesis and treatment. *Current opinion in pediatrics*, 2007, 19.4: 471-479.

BÖLÜM 19

ORBİTA VE GÖRME YOLLARI PATOLOJİLERİ

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Kaslarda izlenen volüm artışının derecesi hastalığın tutulumu ve optik sinir sıkışmasının derecesi ile ilişkilidir(17). Patoloji nedeniyle orbital apeks düzeyinde sinir sıkışması optik nöropati ile sonuçlanır. MRG inceleme daha yüksek yumuşak doku kontrastı ve çoklu planların olması nedeniyle BT' de tanımlanan bulguları daha demonstratif şekilde ortaya koyar. T1 ağırlıklı görüntülerde tutulum diğer kas dokularla izointens, yağ infiltrasyonu derecesine bağlı bazen yağ baskısız sekanslarda yüksek sinyalli izlenmektedir. T2 ağırlıklı görüntülerde enflamasyona sekonder ekstraoküler kaslarda sinyal artışı izlenir. Postkontrast görüntülerde ise kontrast madde artışı gözlenir.

Tuzaklar

Radyolojik ayırıcı tanısında, ekstraoküler kasların tendonlarının tutulmaması ve simetrik tutulum olması nedeniyle diğer orbital tutulumlu patolojilerden kolayca ayrımı yapılabilir.

Tedavi ve Yaklaşım

Hastalık genellikle 2-5 yılda kendini sınırlar. Tedavi genellikle, kornea ülseri, kozmetik sorunlar ve optik sinir kompresyonu için yapılır. Tedavide hasta durumuna göre steroid ile medikal tedavi, radyoterapi veya cerrahi dekompresyon yapılır.

KAYNAKÇA

1. Chang AE, Karnell LH, Menck HR. The National Cancer Data Base report on cutaneous and noncutaneous melanoma: a summary of 84,836 cases from the past decade. The American College of Surgeons Commission on Cancer and the American Cancer Society.*Cancer*. 1998;83(8):1664-78.
2. Singh AD, Turell ME, Topham AK. Uveal melanoma: trends in incidence, treatment, and survival. *Ophthalmology.* 2011;118(9):1881-5.
3. LeBedis CA, Sakai O. Nontraumatic orbital conditions: diagnosis with CT and MR imaging in the emergent setting. *Radiographics.* 2008;28(6):1741-53.
4. Sepahdari AR, Aakalu VK, Kapur R, et al. MRI of orbital cellulitis and orbital abscess: the role of diffusion-weighted imaging. *AJR Am J Roentgenol.* 2009;193(3):W244-50.
5. Tsirouki T, Dastiridou AI, Ibanez Flores N, et al. Orbital cellulitis. Surv *Ophthalmol*. 2018;63(4):534-53.
6. Hamed-Azzam S, AlHashash I, Briscoe D, et al. Common Orbital Infections ~ State of the Art ~ Part I.*J Ophthalmic Vis Res*. 2018;13(2):175-82.
7. Wright JE, McDonald WI, Call NB. Management of optic nerve gliomas.*Br J Ophthalmol*. 1980;64(8):545-52.
8. Millar WS, Tartaglino LM, Sergott RC, et al. *MR of malignant optic glioma of adulthood.AJNR Am J Neuroradiol*. 1995;16(8):1673-6.
9. Müller-Forell WS. *Imaging of Orbital and Visual Pathway Pathology*. 2005.
10. Levin LA, Albert DM. *Ocular disease mechanisms and management*. Edinburgh: Saunders Elsevier; 2010.415-423
11. Asheim J, Spickler E. CT demonstration of dacryolithiasis complicated by dacryocystitis. *AJNR Am J Neuroradiol*. 2005;26(10):2640-1.
12. Larheim TA, Westesson P-L. *Maxillofacial imaging*. Berlin; New York: Springer; 2008.
13. Som PM, Curtin HD. *Head and neck imaging*. St. Louis, Mo.: Mosby; 2003.
14. Aerts I, Lumbroso-Le Rouic L, Gauthier-Villars M, et al. Retinoblastoma. *Orphanet J Rare Dis*. 2006;1:31.

15. Kaste SC, Jenkins JJ, 3rd, Pratt CB, et al. Retinoblastoma: sonographic findings with pathologic correlation in pediatric patients. *AJR Am J Roentgenol*. 2000;175(2):495-501.
16. Glatt HJ. Optic nerve dysfunction in thyroid eye disease: a clinician's perspective. Radiology. 1996;200(1):26-7.
17. Parmar H, Ibrahim M. Extrathyroidal manifestations of thyroid disease: thyroid ophthalmopathy.*Neuroimaging Clin N Am*. 2008;18(3):527-36, viii-ix.

BÖLÜM 20

TEMPORAL KEMİK VE KULAK PATOLOJİLERİ

Fuldem MUTLU[1]

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Schwannomlar ile karşılaştırıldığında daha düşük T2 sinyal intensitesi gösterirler ve prekontrast BT imajlarda daha yüksek attenuasyondadırlar. Kalsifikasyon olması ve diploik mesafede infiltrasyon görülmesi menenjiomlar için güvenilir bulgulardır. Paraganglioma kemik destrüksiyonu, sinir kılıfı tümörleri foramende skalloping yaparken menenjiomlar karakteristik hiperosteozis yaparlar (33).

Tedavi ve yaklaşım

Multidisipliner yaklaşımla cerrahi olarak çıkartılır.

Anahtar Kelimeler

Otitis media, Kolesteatom, Hemotimpanium, Kulak ağrısı, Kulak akıntısı, Radyoloji, YRBT, Otomastoidit, Sekretuar otit, BT, MR, Serumen, Difüzyon MR, Nonechoplanar Single Shot Turbo Spin Echo (SSTSE), Ossiküler erozyon, Malign otitis eksterna, Nekrotizan otitis eksterna, Yabancı cisim, İletim tipi işitme kaybı, Sensörinöral, Eksternal akustik kanal, Temporal kemik, Longitudinal fraktür, Transvers fraktür, Fasial kanal, Otik kapsül, Travma, Petröz apeks, Psödofraktür, Pöschl, Stenvers, Osiküler dislokasyon, Fasial sinir hasarı, BT Angiografi, MR Angiografi, Vestibüler schwannoma, MR sisternografi, Superior semisirküler kanal dehissansı, Tullio fenomeni, Progresif işitme kaybı, Genişlemiş vestibüler aquadukt, Postoperatif görüntüleme, Transplante yağ, Rezidüel/Rekürren kolesteatom, Non EPI/DW, Paraganglioma, Juguler foramen, Menenjiom, Sentrifugal büyüme, En plaque, Mastoidektomi, Timpanik membran, ADC, Serebellopontin bölge, İntrameatal, Ekstrameatal, Tegmen timpani, Enfeksiyon, Labirintis ossifikans

KAYNAKÇA

1. Bhalla AS, Singh A, Jana M. Chronically Discharging Ears: Evalution with High Resolution Computed Tomography**.** *Pol J Radiol.* 2017; 82:478-489.
2. Trojanowska A, Trojanowski B, Rozinska K et al. External and middle ear diseases: radiological diagnosis based on clinical signs and symptoms. *Insights Imaging*. 2012; 3:33–48
3. Platzek I, Kitzler HH, Gudziol V et al. Magnetic resonance imaging in acute mastoiditis. *Acta Radiol Short Rep*. 2014; 3(2): 2047981614523415.
4. Balogh K, Rubin E, Farber JL. (1998). *The head and neck. Pathology, 3rd edn.* (s. 1300–1334). Philadelphia: Lippincott-Raven.
5. Mafee MF, Levin BC et al. Cholesteatoma of middle ear and mastoid: a comparison of CT scan and operative findings. *Otolarngol Clin North Am*. 1998; 21:265–293.
6. Johnson DW, Voorhees RL. Cholesteatoma of temporal bone: role of computed tomography. *Radiology*. 1983; 148:733–737.
7. Martin N, Sterkers O, Nahum M. Chronic inflammatory disease of the middle ear cavities: Gd-DTPA-enhanced MR imaging. *Radiology*. 1990; 176:399–405.
8. Joel D, Swartz H, Harnsberger . *Imaging of temporal bone.* (1997). Stuttgart: Thieme Medical Publishers.
9. Vaid S, Kamble Y, Vaid N et al. Role of Magnetic Resonance Imaging in Cholesteatoma:The Indian Experience *Indian J Otolaryngol Head Neck Surg.* 2013; 65:485–492.

10. Le Bihan D, Turner R. Intravoxel incoherent motion imaging using spin echoes. *Magn Reson Med*. 1991; 19:221–227.
11. Bergui M, Zhong J, Bradac GB et al. Diffusionweighted images of intracranial cyst-like lesions. *Neuroradiology*. 2001; 43:824–829.
12. Williams MT, Ayache D, Alberti C et al. Detection of postoperative residual cholesteatoma with delayed contrast-enhanced MRimaging: initial findings. *Eur Radiol*. 2003; 13:169–174.
13. Kamalian S, Avery L, Lev M. Nontraumatic Head and Neck Emergencies. *RadioGraphics*. 2019; 39(6):1808-1823.
14. Bhat V, Aziz A, Bhandary SK, Aroor R et al. Malignant Otitis Externa - A Retrospective Study of 15 Patients Treated in a Tertiary Healthcare Center. *J IntAdvOtol*. 2015; 11:72-76.
15. Heim SW, Maughan KL. Foreign bodies in the ear, nose, and throat. *Am Fam Physician*. 2007; 76(8):1185-1189.
16. Svider PF, Vong A, Sheyn A, et al. What are we putting in our ears? a consumer product analysis of aural foreign bodies. *Laryngoscope*. 2015; 125(3):709-714.
17. Davies PH, Benger JR. Foreign bodies in the nose and ear: a review of techniques for removal in the emergency department. *J Accid Emerg Med*. 2000; 17(2):91-94.
18. Cannon CR, Jahrsdoerfer RA. Temporal bone fractures: review of 90 cases. *Arch Otolaryngol*. 1983; 109(5):285–288.
19. Juliano AF, Ginat D, Moonis G, et al. Imaging Review of the Temporal Bone: Part II. Traumatic, Postoperative, and Noninflammatory Nonneoplastic Conditions. *Radiology* 2015; 276:3.
20. Fujikawa A, Tachiazawa N, Takaya M, et al. Temporal Bone Trauma: Typical CT and MRI Appearances and Important Points for Evaluation. *Radiographics*. 2020; 40:1148–1162.
21. Lin E, Crane B. The management and imaging of vestibular schwannomas. AJNR Am J Neuroradiol. 2017; 38(11):2034-2043.
22. Metwali H, Samii M, Samii A, et al. The peculiar cystic schwannoma: A single-center experience. *World Neurosurg*. 2014 ;82(6):1271-1275.
23. Kanzaki J, Tos M, Sanna M. et al. New and modified reporting systems from the consensus meeting on systems for reporting results in vestibular schwannoma. *Otol Neurotol*. 2003; 24(4):642-649.
24. Silk PS, Lane JI, Driscoll CL. Surgical approaches to vestibular schwannomas: what the radiologist needs to know. *Radiographics*. 2009; 29 (7):1955-70.
25. Yew A, Zarinkhou G, Spasic M et-al. Characteristics and management of superior semicircular canal dehiscence. *J Neurol Surg B Skull Base*. 2012; 73 (06): 365-70.
26. Belden CJ, Weg N, Minor LB et-al. CT evaluation of bone dehiscence of the superior semicircular canal as a cause of sound- and/or pressure-induced vertigo. *Radiology*. 2003; 226 (2): 337-43.
27. Minor LB. Clinical manifestations of superior semicircular canal dehiscence. *Laryngoscope*. 2005; 115 (10): 1717-27.
28. Goldfeld M, Glaser B, Nassir E et-al. CT of the ear in Pendred syndrome. *Radiology*. 2005; 235 (2):537-40.
29. Ho ML, Moonis G, Halpin CF. Spectrum of Third Window Abnormalities: Semicircular Canal Dehiscence and Beyond. *AJNR Am J Neuroradiol.* 2017; 38:2–9.
30. Wang J, Huang X, Chen H, et al. Sudden deafness with large vestibular aqueduct (case report and literatures review). 2002; 16:515–517.
31. AjalloueyanM. Experience with surgical management of cholesteatomas. *Arch Otolaryngol Head Neck Surg* 2006;132:931–33.
32. Inagawa T, Kamiya K, Hosoda I, et al. Jugular foramen meningioma. *Surg Neurol* 1989; 31:295–9.
33. Molony TB, Brackmann DE, Lo WW. Meningiomas of the jugular foramen. *Otolaryngol Head Neck Surg* 1992; 106:128–136.

BÖLÜM 21

SUPRAHYOİD BOYUN PATOLOJİLERİ

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KAYNAKÇA

1. Regezi JA, Sciubba J, Jordan J, Oral Pathology: Clinical Pathologic Correlations. 4th ed. Philadelphia: *Saunders Elsevier*; 2003. p. 196-198
2. Okuyucu Ş, Gülmez Mİ, Özler GS, et al. Bukkal bölgeden kaynaklanan pleomorfik adenom: olgu sunumu. *KÜ Tıp Fak Derg* 2014; 16: 44-48.
3. Sharma, S. Pleomorphic adenoma of hard palate: a case report and review of literature. IJSS 2015; 1:12-14. https://doi: 10.5114/wo.2013.33438
4. Howlett DC, Menezes LJ, Lewis K et al. Sonographically guided core biopsy of a parotid mass. *AJR Am J Roentgenol*. 2007;188 (1): 223-227. Https://doi:10.2214/AJR.05.1549.
5. Alaani A, Griffiths H, Minhas SS et al. Parapharyngeal abscess: diagnosis, complications and management in adults. Eur Arch Otorhinolaryngol. 2005;262 (4): 345-350. doi:10.1007/s00405-004-0800-6.
6. Croche Santander B, Prieto Del Prado A, et al. Retropharyngeal and parapharyngeal abscess: experience in a tertiary-care center in Seville during the last decade]. *An Pediatr (Barc).* 2011;75 (4): 266-272. doi: 10.1016/j.anpedi.2011.03.010.
7. Capps EF, Kinsella JJ, Grupta M et al. Emergency imaging assessment of acute, nontraumatic conditions of the head and neck. *Radiographics*.2010;30(5):1335-1352.Doi:10.1148/rg.305105040
8. Davidovic LB, Djukic VB, Vasic DM et al. Diagnosis and treatment of carotid body paraganglioma: 21 years of experience at a clinical center of Serbia. *World J Surg Oncol*. 2005;3 (1): 10. DOI:10.1186/1477-7819-3-10.
9. Lee KY, Oh YW, Noh HJ et al. Extra Adrenal paragangliomas of the body: imaging features. *AJR Am J Roentgenol*. 2006;187 (2): 492-504. DOI:10.2214/AJR.05.0370.
10. Arya S, Rao V, Juvekar S et al. Carotid body tumors: objective criteria to predict the Shamblin group on MR imaging. *AJNR Am J Neuroradiol*. 2008;29 (7): 1349-1354. DOI:10.3174/ajnr. A1092.
11. Mac Donald-Jankowski DS, Yeung RW, et al. Computed tomography of odontogenic myxoma. *Clin Radiol*. 2004;59(3):281-287. DOI:10.1016/j.crad.2003.09.024.
12. J.A. Chuchurru, R. Luberti, J.C. Cornicelli, F.V. Domingues Myxoma of the mandible with unusual radiographic appearance J *Oral Maxillofac Surg*, 1985;43): 987-990. DOI: 10.1016/0278-2391(85)90018-7.
13. Miranda Rius J, Nadal A, Lahor E, et al. Unusual presentation of localized gingival enlargement associated with a slow-growing odontogenic myxoma. *Int J Oral Sci* 2013; 5: 172–175. DOI: 10.1038/ijos.2013.27.
14. Lustmann J, Regev E, Melamed Y. Sialolithiasis: a survey on 245 patients and a review of the literature.*Int J Oral Maxillofac Surg*. 1990; 19:135–138.DOI: 10.1016/s0901-5027(05)80127-4.
15. Marchal F, Dulguerov P. Marchal F, Dulguerov P. Marchal F, Dulguerov P. Int *J Oral Maxillofac Surg*. 1990; 19:135–138.DOI: 10.1016/s0901-5027(05)80127-4.
16. Oteri G, Procopio RM, Cicciù M. Giant salivary gland calculi (GSGC): report of two cases. *Open Dent* J. 2011; 5:90–95. DOI: 10.2174/1874210601105010090.
17. Coste AH, Shermetaro C. Cyst, Branchial Cleft. Treasure Island, FL:StatPearls Publishing; 2018.
18. Agaton-Bonilla FC, Gay-Escoda C. Diagnosis and treatment of branchial cleft cysts and fistulae. A retrospective study of 183 patients. Int J *Oral Maxillofac Surg* 1996; 25:449–452. DOI: 10.1016/s0901-5027(96)80081-6.
19. Yilmaz I, Cakmak O, Ozgirgin N, et al. Complete fistula of the second branchial cleft: case report of catheter-aided total excision. *Int J Pediatr Otorhinolaryngol* 2004; 68:1109–1113. DOI: 10.1016/j.ijporl.2004.04.016

BÖLÜM 23

KONJENİTAL SPİNAL ANOMALİLER

Büşra ŞEKER1
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Önemli Noktalar

Vertebra formasyon kusuru ya da vertebral segmentasyon ve füzyon anomalisi vertebral formasyonun parsiyel veya komplet yetersizliği sonucu oluşmaktadır. Parsiyel formasyon yetersizliği sonucu kama şeklinde vertebra, komplet formasyon yetersizliği sonucu ise vertebra aplazisi, hemivertebra, kelebek vertebra anomalileri oluşmaktadır (12). En sık torakolomber bölgede görülmektedir. Deforme vertebra korpuslarını içeren keskin açılı, tek eğrili veya fokal skolyoz izlenmektedir. Görüntülemede radyografi vertebral anomaliler ve eşlik eden skolyozu (dengeli-dengesiz) değerlendirmede faydalıdır. BT'de sagittal ve koronal vertebral yarıklarının, hemivertebra ve kelebek vertebranın aksiyel planda değerlendirilmesi güç olabileceği için sagittal ve koronal reformatların oluşturulması faydalı olacaktır. Posterior elemanların disrafizmi ise en iyi aksiyel planda değerlendirilmektedir. Üç boyutlu BT reformat görüntüleri ise cerrahi planlama için faydalıdır. MR ise vertebra anomalileri yanı sıra eşlik eden spinal kord anomalilerinin değerlendirilmesinde faydalıdır. Vertebra korpus anomaliler agenezi, hemivertebra (dorsal-ventral), koronal kleft, kelebek vertebra, blok vertebra ve hipoplastik vertebra olarak sınıflandırılabilir. Klinik olarak hastalar asemptomatik olabilir ya da g bağlı semptomatik hale gelebilmektedirler (4).

Tuzaklar

Eşlik edebilecek sendromlar (VATER/VACTERL, Aicardi sendromu, kleidokranial dizostozis, kloakal ekstrofi, Goldenhar sendromu, Gorlin sendromu, Jarcho-Levin sendromu, Juberg-Hayward sendromu, Klipper Feil sendromu, OEIS kompleksi, Alagille sendromu) ve bunların görüntüleme bulguları raporlamada dikkate alınmalıdır (4).

Tedavi ve yaklaşım:

Hafif vakalarda hastalar takip edilmektedir. Orta ve ağır vakalarda ise kifoskolyoz gelişimini durdurmak için cerrahi füzyon yapılmaktadır (4).

KAYNAKÇA

1. Karin MU, Theresa G, Martin CF et al. US of the Spinal Cord in Newborns: Spectrum of Normal Findings, Variants, Congenital Anomalies, and Acquired Diseases. RadioGraphics. 2000; 20:923–938.
2. Barkovich AJ (2018). Congenital Anomalies of Spine. Erin Simon Schwartz ve A. James Barkovich (Ed.), *Pediatric Neuroimaging Sixth Edition* içinde (s.1311-1401). Philadelphia: Wolters Kluwer.
3. Tortori-Donati P, Rossi A, Cama A. Spinal Dysraphism:A Review of Neuroradiological Features with Embryyological Correlations and Proposal for a New Classification. Neuroradiology (2000) 42:471-491.
4. Ross, JS. (2016).*Diagnośtic Imaging Omurga.* (Evrim Özmen,Halil Arslan, Çev. Ed.). Ankara: Güneş Tıp Kitabevi.
5. J. J. Savage, J. N. Casey, I. T. McNeill et al. Neurenteric cysts of the spine. J Craniovert Jun Spine 2010, 1:11.

6. Herve D, Lionel A, Dominique W et al. Retrorectal Developmental Cysts in Adults: Clinical and Radiologic-Histopathologic Review, Differential Diagnosis,and Treatment. RadioGraphics 2001; 21:575–584
7. Pablo CD, Juan B, Julie HM. Currarino Syndrome in a Fetus, Infant, Child, and Adolescent: Spectrum of Clinical Presentations and Imaging Findings. 2016 Canadian Association of Radiologists.
8. Hee Mang Y, Sun-ju B, Jae-Yeon H et al. Sacrococcygeal teratomas in newborns: acomprehensive review for the radiologists. Acta Radiologica 2018, Vol. 59(2) 236–246.
9. David MS, Risa AF, David WR et al. Color Doppler Aided Prenatal Diagnosis of a Type 1 Cystic Sacrococcygeal Teratoma Simulating a Meningomyelocele. Am J Perinatol 1997; 14(1): 13-15.
10. Daryl E. Warder. Tethered cord syndrome and occult spinal dysraphism. Neurosurg Focus 10 (1):Article 1, 2001.
11. Stephanie LR, Mohannad I, Charles AR et al. Congenital Spine and Spinal Cord Malformations—Pictorial Review. AJR 2010;194:26–37.
12. Kumar R, Guinto FC, Madewell JE et al. The Vertebral Body: Radiographic Configurations in Various Congenital and Acquired Disorders. Radiographics. 1988;8 (3): 455-485.

BÖLÜM 24

SPİNAL BÖLGE ENFLAMMATUAR ve ENFEKSİYÖZ DURUMLAR

Fatma CAN[1]

Vaka 1: Transvers miyelit

Vaka 2: Multipl Skleroz

Vaka 3: Guillan-Barre Sendromu

Vaka 4: Araknoidit (Tip2) (adeziv araknoidit)

Vaka 5: Enfeksiyoz diskit

Vaka 6: Epidural Apse

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alanda kitle etkisi ve homojen kontrastlanma gösterirler. Kitle etkisi apseye göre daha azdır (19).

Tedavi ve yaklaşım

Tedavi acil cerrahi drenaj ve dekompresyonu içerir. Etken patojen izole edilene kadar geniş spektrumlu antibiyotikler kullanılabilir (18).

KAYNAKÇA

1. Jacob A, Weinshenker BG. An Approach to the Diagnosis of Acute Transverse Myelitis. *Semin Neurol* 2008; 28(1): 105-120. doi: 10.1055/s-2007-1019132
2. Goh C, Desmond PM, Phal PM. MRI in transverse myelitis. *J Magn Reson Imaging.* 2014 Dec;40(6):1267-79. doi: 10.1002/jmri.24563.
3. Dutra BG, da Rocha AJ, Nunes RH, Maia ACM Júnior. Neuromyelitis Optica Spectrum Disorders: Spectrum of MR Imaging Findings and Their Differential Diagnosis. *Radiographics.* 2018 Jan-Feb;38(1):169-193. doi:10.1148/rg.2018170141.
4. Awad A, Stüve O. Idiopathic transverse myelitis and neuromyelitis optica: clinical profiles, pathophysiology and therapeutic choices. *Curr Neuropharmacol*. 2011 Sep; 9(3): 417–428. doi: 10.2174/157015911796557948
5. Moccia M, Ruggieri S, Ianniello A, Toosy A, Pozzilli C, Ciccarelli O. Advances in spinal cord imaging in multiple sclerosis. *Ther Adv Neurol Disord*. 2019 Apr 22;12:1756286419840593. doi: 10.1177/1756286419840593.
6. Kearney H, Miller DH, Ciccarelli O. Spinal cord MRI in multiple sclerosis--diagnostic, prognostic and clinical value. *Nat Rev Neurol.* 2015 Jun;11(6):327-38. doi: 10.1038/nrneurol.2015.80.
7. McNamara C, Sugrue G, Murray B, MacMahon PJ. Current and Emerging Therapies in Multiple Sclerosis: Implications for the Radiologist, Part 2-Surveillance for Treatment Complications and Disease Progression. *AJNR Am J Neuroradiol.* 2017 Sep;38(9):1672-1680. doi: 10.3174/ajnr.A5148.
8. Alkan O, Yildirim T, Tokmak N, Tan M. Spinal MRI findings of guillain-barré syndrome. *J Radiol Case Rep.* 2009;3(3):25-8.doi: 10.3941/jrcr.v3i3.153.
9. Meena AK, Khadilkar SV, Murthy JM. Treatment guidelines for Guillain–Barré Syndrome. *Ann Indian Acad Neurol*. 2011 Jul; 14(Suppl1): S73–S81. doi: 10.4103/0972-2327.83087
10. Dahnert W. (2003). *Radiology Review Manual* (Fifth Edition). PA: Lippincott Williams @Wilkins. ISBN: 0-7817-4822-4. P187-188
11. Gürbüz MS, Erdoğan B, Yüksel MO, Somay H. Postlumbar puncture arachnoiditis mimicking epidural abscess. *BMJ Case Rep*. 2013 Nov 6;2013. pii: bcr2013200169. doi: 10.1136/bcr-2013-200169.
12. Anderson TL, Morris JM, Wald JT, Kotsenas AL. Imaging Appearance of Advanced Chronic Adhesive Arachnoiditis: A Retrospective Review. *AJR Am J Roentgenol.* 2017 Sep;209(3):648-655. doi: 10.2214/AJR.16.16704.
13. Ross JS,Masaryk TJ,Modic MT et al. MR imaging of lumbar arachnoiditis. *AJR Am J Roentgenol.* 1987 Nov;149(5):1025-32.
14. Hong SH, Choi JY, Lee JW et al. MR Imaging Assessment of the Spine: Infection or an Imitation? *Radiographics.* 2009 Mar-Apr;29(2):599-612. doi: 10.1148/rg.292085137.
15. Yeom JA, Lee IS, Suh HB, Song YS, Song JW. Magnetic Resonance Imaging Findings of Early Spondylodiscitis: Interpretive Challenges and Atypical Findings. *Korean J Radiol.* 2016 Sep-Oct;17(5):565-80. doi: 10.3348/kjr.2016.17.5.565.
16. Acharya J, Gibbs WN. Imaging spinal infection, *Radiology of Infectious Diseases* Volume 3, Issue 2, June 2016, Pages 84-91. doi.org/10.1016/j.jrid.2016.03.001
17. Prodi E, Grassi R, Iacobellis F, Cianfoni A. Imaging in Spondylodiskitis. *Magn Reson Imaging Clin N Am* 24 (2016) 581–600. doi: 10.1016/j.mric.2016.04.005
18. DeSanto J, Ross JS. Spine Infection/ Inflammation. *Radiol Clin N Am*. 2011 Jan;49(1):105-27. doi: 10.1016/j.rcl.2010.07.018.
19. Prodi E, Grassi R, Iacobellis F, Cianfoni A. Imaging in Spondylodiskitis. *Magn Reson Imaging Clin N Am*. 2016 Aug;24(3):581-600. doi: 10.1016/j.mric.2016.04.005.

BÖLÜM 25

OMURGANIN DEJENERATİF HASTALIKLARI

Eray ATLI[1]

Vaka 1: İntervertebral disk dejenerasyonu, yükseklik kaybı ve disk dehidrasyonu, anüler fissür

Vaka 2: Posteriyor santral, sağ paramediyan-subartiküler ve sol ekstraforaminal (far lateral) protrüzyon.

Vaka 3: Foraminal ekstrüzyon ve sekestrasyon, sinir köküne foramende bası.

Vaka 4: İntervertebral diskte taşma, schmorl nodülü, intervertebral disklerde dehidrasyon ve yükseklik kaybı.

Vaka 5: Osteofit, disk osteofit kompleksleri, skleroz (Modik tip III değişiklik), schmorl nodülü, dejeneratif değişiklikler, santral kanalda darlık, longutidünal ligamanda ossifikasyon (diffüz idiyopatik iskelet hiperostozis, DISH).

Vaka 6: Modik tip I değişikliği.

Vaka 7: Modik tip I ve II değişiklik.

Vaka 8: Modik tip III değişikliği ve Dejeneratif değişiklikler

Vaka 9: Faset eklemde artropati, foraminal daralma, sağ faset eklem ile ilişkili kist.

Vaka 10: Servikal unkovertebral dejeneratif artropati, disk aralığında daralma, faset artropati, anterolistezis.

Vaka 11: Dejenerasyon zemininde edinilmiş spinal darlık

Vaka 12: Anterolistezis, dejenerasyon, osteofit, pars interartikülaris defekti (spondilolizis), lomber lordozda düzleşme, retrolistezis, anterolistezis,

Vaka 13: Anterolistezis, osteofit, pars interartikülaris defekti (spondilolizis), anterolistezis

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Lizisin şiddeti ve listezisin derecesi ile yol açtığı semptomlara bağlı olarak tedavi değişir, listezisin derecesi yükseldikçe cerrahi tedavi oranı artmaktadır, grade 1 listezis çoğunlukla konzervatif, nadiren cerrahi tedavi; grade 2 ve üstündeki listezis olgularında nadiren konzervatif, çoğunlukla cerrahi tedavi tercih edilir.

Anahtar Kelimeler

İntervertebral disk dejenerasyonu, intervertebral disk dehidrasyonu, anüler fissür, disk herniyasyonu, protrüzyon, ekstrüzyon, disk taşması(bulging), dejeneratif omurga hastalığı, osteofit, disk osteofit kompleksi, stabilite, instabilite, endplate ve subkondral kemik iliği sinyal değişiklikleri, Modik tip I, vertebra korpusunda subkondral enflamasyon, Modik tip II, vertebra korpusunda subkondral yağlanma, Modik tip III, vertebra korpusunda subkondral skleroz, faset artropatisi, faset kisti, faset eklemde osseöz hipertrofi, unkovertebral eklem dejenerasyonu, foraminal stenoz, edinilmiş spinal kanal darlığı, spondilolistezis, anterolistezis, retrolistezis, spondilozis, pars interartikülaris defekti

KAYNAKÇA

1. Resnick D. Degenerative diseases of the vertebral column. *Radiology.* 1985;156:3-14.
2. Sanelli PC, Schaefer PW, Loevner LA. *Nörogörüntüleme: Esaslar.* (Kader Karlı Oğuz, Çev. Ed.). Ankara: Dünya Tıp Kitapevi;(2015)
3. Fardon DF, Williams AL, Dohring EJ, et al. Lumbar disc nomenclature: version 2.0: Recommendations of the combined task forces of the North American Spine Society, the American Society of Spine Radiology and the American Society of Neuroradiology. *Spine J*. 2014;14:2525-2545.
4. Belanger TA, Rowe DE. Diffuse idiopathic skeletal hyperostosis: musculoskeletal manifestations. J Am Acad Orthop Surg. 2001;9:258-267.
5. Rahme R, Moussa R. The modic vertebral endplate and marrow changes: pathologic significance and relation to low back pain and segmental instability of the lumbar spine. *AJNR Am J Neuroradiol*. 2008;29:838-842.
6. Radiopaedia.org. Spinal stenosis. (15/03/2020 tarihinde https://radiopaedia.org/articles/spinal-stenosis-1 adresinden ulaşılmıştır).
7. Radiopaedia.org. Spondylolisthesis. (19/03/2020 tarihinde https://radiopaedia.org/articles/spondylolisthesis-1 adresinden ulaşılmıştır).
8. Radiopaedia.org. Spondylolisthesis grading system. (19/03/2020 tarihinde https://radiopaedia.org/articles/spondylolisthesis-grading-system?lang=us adresinden ulaşılmıştır).