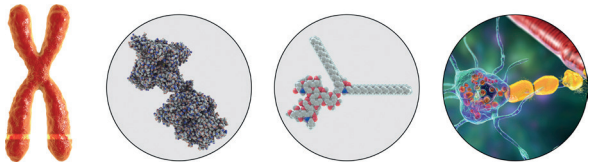

BÖLÜM 5 OPTİK NÖRİT

Tuba EKMEKYAPAR[1]

GİRİŞ

Optik nörit; optik sinirin demiyelinizan, enfeksiyöz yada enflamatuvar nedenlere bağlı olarak, çoğunlukla unilateral, göz hareketleri ile ağrılı, santral görme kaybı ve diskramotopsinin olduğu optik nöropatisidir (1,2). Bu hastaların tanısında öykü, nörooftalmolojik muayene, radyolojik ve serolojik yöntemler kullanılmaktadır. Gençlerde görülen tipik optik nörit olgularının; multipl skleroz (MS) hastalığı için bir öncü semptom olduğu yapılan çalışmalarla gösterilmiştir (3). Optik nöritin kliniği, tutulumu, tedaviye cevabı, nüks oranları ve biyobelirteçlerinin saptanması ile birçok atipik optik nörit ile ilişkili hastalık tanımlanmıştır. Bu bölümde optik nöritin tanımı, klinik prezentasyonları, serolojik incelemeleri, tipik ve atipik optik nörit spektrum hastalıkları ve tedavi yaklaşımları anlatılmıştır.

OPTİK NÖRİT

1884 yılında Nettleship tarafından optik nöritin klasik semptomları ilk kez tanımlanmıştır (1). Burada görme bozukluğunun tek göze sınırlı, sıklıkla şakaklarda ve orbitada lokalize, göz hareketleri ile artan ağrının eşlik ettiği, kalıcı hasar veya tam görme kaybının olabildiği, nörooftalmolojik bulguların başlangıçta normal veya kısmen saptanabildiği, optik diskin de birkaç hafta içinde atrofiye gittiği belirtilmiştir (1).

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KAYNAKLAR

1. Nettleship E. On cases of retro-ocular neuritis. Trans Ophthal Soc UK 1884;4:186–226.
2. Newman NJ. Optic neuropathy. Neurology 1996; 46: 315-322.
3. Optic Neuritis Study Group. Multiple sclerosis risk after optic neuritis: Final optic neuritis treatment trial follow-up. Arc Neurol. 2008;65:727-32.
4. Walsh T. Neuro ophtalmology clinical signs and symptoms, Third ed. Leg. Febiger 1992.
5. Acaroğlu G. Optik nevrit. Türkiye klinikleri J Med Sci. 2006;14:20-24.
6. Gilman S, Newman S. Manter and Gatz's Essentials of clinical neuroanatomy and neurophysiology. Dawis company. 1987.
7. Güven D. Retina ve optik sinirin anatomisi ve fizyolojisi. Türkiye Klinikleri J Ophthalmol-Special Topics.2009;2(3):6-12.
8. Sadun AA. Anatomy and Physiology of the Optic Nerve. In: Miller NR and Newman NJ. Walsh and Hoyt's Clinical Neuro-Ophthalmology. Fifthedition. Baltimore, Maryland, USA:Williams and Wilkins, 1998;57-83.
9. Selhorst J, Chen Y. The optic nerve. Semin Neurol. 2009; 29(1):29-35.
10. Daroff, R.B., Jankovic, J., Mazziotta, J.C., Pomeroy, S.L., 2015. Bradley's neurology in clinical practice e-book, 7 ed. Elsevier Health Sciences.
11. Biousse, V., Newman, N.J., 2016. Diagnosis and clinical features of common optic neuropathies. The Lancet Neurology 15(13), 1355-1367.
12. Alves JM, Seabra M, Braz L, Guimarães J. Optic neuropathy: A 15-year retrospective observational study. Mult Scler Relat Disord. 2020;44:102337.
13. Banwell B, Kennedy J, Sadovnick D, et al. Incidence of acquired demyelination of the CNS in Canadian children. Neurology 2009;72(3):232-39.
14. Melinda Y. Chang, MD, and Stacy L. Pineles, MD. Pediatric Optic Neuritis. Pediatric Neurology 2017;24(2):122-28.
15. Compston AS, Batchelor JR, Earl CJ, McDonald WI. Factors influencing the risk of Multiple Sclerosis developing in patient with optic neuritis. Brain. 1978;101:495-511.
16. Wikström J, Kahana E, Alter M et al. Optic Neuritis in Relation to Multiple Sclerosis. J Neurol 1976; 213: 87-95.
17. Balcer IJ. Clinical practice. Optic neuritis. N Engl J Med 2006;354:1273-80.
18. Kurtzke JF. Optic neuritis or multiple sclerosis. Arch Neurol 1985; 42:704-10.
19. Karti O, Karti DT, Kilic İH, Gokcay F, Celebisoy N. Baseline demografics, clinical features, and treatment protocols of 240 patients with optic neuropathy: experiences from a neuro-ophtalmological clinic in the Aegean region of Turkey. Int Ophthalmol. 2019;39 (1):155-166.
20. Bennett J. Optic Neuritis. Continuum (Minneap Minn). 2019 October;25(5):1236-1264.
21. Optic Neuritis Study Group. The clinical profile of optic neuritis. Experience of the Optic Neuritis Treatment Trial. Arch Ophthalmol 1991; 109(12):1673–1678.

22. Beck RW. The optic neuritis treatment trial: Three-year follow-up results. Arch Ophthalmol 1995;113:136–7.
23. Haerer AF. The neurologic examination. JB. Lippincot. Fifth Ed. 1992.
24. Wilhelm H, Schabet M. The diagnosis and treatment of optic neuritis. Dtsch Arztebl Int.2015;112:616-26.
25. Aydın O'Dwyer P. Pupilla. Nöro-oftalmoloji El kitabı. Aydın O'Dwyer P, Kansu T, Torun N (Ed.). Güneş Tıp Kitapevleri, 2008.
26. Tekeli O. Görme Alanı Defektleri. Nöro-oftalmoloji El kitabı. Aydın O'Dwyer P, Kansu T, Torun N (Ed.). Güneş Tıp Kitapevleri, 2008.
27. Halliday AM, McDonald WI, Mushin J. Delayed VER in optic neuritis.Lancet. 1972 ;1:982-985.
28. Aminoff MJ. Electrodiagnosis in Clinical Neurology. Forth Edition. Churchill Livingston, 1999.
29. Fraser C, Klistorner A, Graham S et al. Multifocal visual evoked potential latency analysis. predicting progression to multiple sclerosis. Arch Neurol 2006; 63: 847–850.
30. Gala F. Magnetic resonance imaging of optic nerve. Indian J Radiol Imaging. 2015;25(4):421-38.
31. Beck RW, Arrington J, Murtagh FR et al. Brain MRI in acute optic neuritis: experience of the Optic Neuritis Study Group. Arch Neurol 1993;8:841–46.
32. Optic Neuritis Study Group. High risk and low risk profiles for the development of multiple sclerosis within 10 years after optic neuritis. Experience of the Optic Neuritis Treatment Trial. Arch Ophthalmol 2003;121**:**944–49.
33. Frohman EM, Goodin D, Calabresi P et al. The utility of MRI in suspected MS. The Therapeutics and Technology Assessment Committee of the American Academy of Neurology. Neurology 2003;61:602-11.
34. Barton JJ, Cox TA, Digre KB. Acquired convergence-evoked pendular nystagmus in multiple sclerosis. J Neuro-ophthalmol 1999;19:34-38.
35. Sheng J, Li Q, Liu T, Wang X. Cerebrospinal fluid Dynamics along the optic nerve. Front. Neurol. 13:931523.
36. Optic Neuritis Study Group. The 5-year risk of MS after optic neuritis: experience of the optic neuritis treatment trial. Neurology 1997; 49:1404-13.
37. Tejeda-Velarde A, Costa-Frossard L, Sainzdela Maza S, Carrasco Á, Espiño M, Picón C, et al. Clinical usefulness of prognostic biomarkers in optic neuritis. Eur J Neurol 2018;25:614-8.
38. Swanton JK, Fernando KT, Dalton CM et al. Early MRI in optic neuritis: the risk for disability. Neurology 2009;72(6):542-550.
39. Lennon VA, Kryzer TJ, Pittock SJ, Verkman AS, Hinson SR. IgG marker of optic-spinal multiple sclerosis binds to the aquaporin-4 water channel. J Exp Med. 2005; 202:473–77.
40. Papadopoulos MC, Verkman AS. Aquaporin 4 and neuromyelitis optica. Lancet Neurol. 2012; 11(6):535-44.

41. Lennon VA, Wingerchuk DM, Kryzer TJ, Pittock SJ, Lucchinetti CF, Fujihara K, et al. A serum autoantibody marker of neuromyelitis optica: Distinction from multiple sclerosis. Lancet 2004;364:2106-12.
42. Sarkar P, Mehtani A, Gandhi HC, Dubey V, Temphurde PM, Gupta MK. Atypical optic neuritis: An overview. Indian Journal of Ophtalmology.2020; 69 (1): 27-35.
43. Hor JY, Asgari N, Nakashima I, Broadley SA, Leite MI, et al. Epidemiology of Neuromyelitis Optica Spectrum Disorder and Its Prevalence and Incidence Worldwide. Front Neurol. 2020; 11(501):1-13.
44. Song H, Zhou H, Yang M, Wang J, Liu H, Sun M, et al. Different characteristics of aquaporin-4 and myelin oligodendrocyte glycoprotein antibody-seropositive male optic neuritis in China. J Ophthalmol 2019;2019:4015075.
45. Chen JJ, Pittock SJ, Flanagan EP, Lennon VA, Bhatti MT. Optic neuritis in the era of biomarkers. Surv Ophthalmol 2020;65:12-7.
46. Takai Y, Misu T, Takahashi T, Nakashima I, Fujihara K. NMO spectrum disorders and anti AQP4 antibody. Brain Nerve. 2013; 65(4): 333-43.
47. Modvig S, Degn M, Roed H, Sørensen TL, Larsson HB, Langkilde AR, et al. Cerebrospinal fluid levels of chitinase 3-like 1 and neurofilament light chain predict multiple sclerosis development and disability after optic neuritis. Mult Scler 2015;21:1761-70.
48. Cong H, Jiang H, Peng J, Cui S, Liu L, Wang J, et al. Change of Th17 Lymphocytes and Treg/Th17 in Typical and Atypical Optic Neuritis. PLoS One 2016;11:e0146270.
49. Tian AY, Zhang RW, Shi XG, Yu HM. Alteration of T helper cell subsets in the optic nerve of experimental autoimmune encephalomyelitis. Int J Mol Med 2010; 25:869-74.
50. Fujimoto JG, Brezinski ME, Tearney GJ et al. Optical biopsy and imaging using optical coherence tomography. Nat Med 1995;1:970-972.
51. Oberwahrenbrock T, Schippling S, Ringelstein M, et al.: Retinal damage in multiple sclerosis disease subtypes measured by high- resolution optical coherence tomography. Mult Scler Int 2012; 2012: 530305.
52. Panicker G, Kaliaperumal S, Narayan S, Mani M. Glaucoma and optical coherence tomography changes in migraine: A comparative cross-sectional study. Indian J Ophthalmol. 2021;69(12): 3546-51.
53. Abel A, Mcclelland C, Lee MS. Critical review: Typical and atypical optic neuritis. Survey of Ophthalmology. 2019; 64(6) :770-79.
54. Compston A, Coles A. 2008. Multiple sclerosis. Lancet 372: 1502–17.
55. Tullman MJ. Overview of the epidemiology, diagnosis, and disease progression associated with multiple sclerosis. Am J Manag Care.2013;19:5-20.
56. Beck RW, Cleary PA, Anderson MM, et al. A randomized, controlled trial of corticosteroids in the treatment of acute optic neuritis. The Optic Neuritis Study Group. N Engl J Med 1992;326(9): 581– 588.
57. Gal RL, Vedula SS, Beck R. Corticosteroids for treating optic neuritis. Cochrane Database Syst Rev. 2015;(8):CD001430.

58. Fu J, Wang Y, Li H, Zhou H, Song H, Sun M, Xu Q, Tan S, Wei S. Efficacy of plasma exchange treatment for demyelinating optic neuritis associated with various serum antibodies: A prospective cohort study. Neurol Ther. 2022;11(2):797-813.
59. Raftopoulos R, Hickman SJ, Toosy A, et al. Phenytoin for neuroprotection in patients with acute optic neuritis: a randomised, placebo-controlled, phase 2 trial. Lancet Neurol 2016;15(3): 259– 269.
60. Devic E. Myélite subaiguë compliquée de névrite optique.1894. Le Bull. Méd. 8:1033-34.
61. Gault F. De la neuromyélite optique aiguë. Faculté de Médecine et de Pharmacie Alexandre Rey. Lyon.1894.
62. Trebst C, Jarius S, Berthele A, et al.: Update on the diagnosis and treatment of neuromyelitis optica: recommendations of the Neuro- myelitis Optica Study Group (NEMOS). J Neurol 2014; 261: 1–16.
63. Morrow MJ, Wingerchuk D: Neuromyelitis optica. J Neuroophthal- mol 2012; 32: 154–66.
64. Wingerchuk DM, Banwell B, Bennett JL, et al. International consensus diagnostic criteria for neuromyelitis optica spectrum disorders. Neurology. 2015;85(2):177e89.
65. Lana-Pexioto MA, Talim N. Neuromyelitis optica spectrum disorder and anti-MOG syndromes. Biomedicines. 2019;7(2):42.
66. Jurynczyk M, Messina S, Woodhall MR, et al. Clinical presentation and prognosis in MOG- antibody disease: a UK study. Brain 2017;140(12): 3128–3138.
67. Lee EJ, Lim YM, Kim S, Choi L, Kim H, Kim K, Kim HW, Lee JS, Kim KK. Clinical implication of serum biomarkers and patient age in inflammatory demiyelinating diseases. Annalsa of Clinical and Translational Neurology.2020; 7(6): 992-1001.
68. Watanabe M, Nakamura Y, Michalak Z, et al. GFAP and neurofilament light as biomarkers of disease activity and disability in NMOSD. Neurology. 2019.
69. Phuljhele S, Kedar S, Saxena R. Approach to optic neuritis: an update. Indian Journal of Ophtalmology. 2021;69(9): 2266-75.
70. Flanagan EP, Hinson SR, Lennon VA, et al. Glial fibrillary acidic protein immunoglobulin G as biomarker of autoimmune astrocytopathy: analysis of 102 patients. Ann Neurol 2017; 81:298–309.
71. Chen JJ, Aksamit AJ, McKeon A, et al. Optic disc edema in glial fibrillary acidic protein autoantibody-positive meningoencephalitis. J Neuroophthalmol 2018;38(3):276–281.
72. Kunchok A, Zekeridou A, Mckeon A. Autoimmune glial fibrillary acidic protein astrocytopathy. Current Opinion Neurology.2019; 32(3):452-58.
73. Kidd D, Burton B, Plant GT, Graham EM. Chronic relapsing inflammatory optic neuropathy (CRION). Brain 2003;126(pt 2):276–284.
74. Petzold A, Plant GT. Chronic relapsing inflammatory optic neuropathy: a systematic review of 122 cases reported. J Neurol 2014;261(1):17–26.
75. Vitali C, Bombardieri S, Jonsson R, et al. Classification criteria for Sjögren's syndrome: a revised version of the European criteria proposed by the American-European Consensus Group. Ann Rheum Dis 2002;61(6):554–558.

76. Massara A, Bonazza S, Castellino G, et al. Central nervous system involvement in Sjögren's syndrome: unusual, but not unremarkable-clinical, serological characteristics and outcomes in a large cohort of Italian patients. Rheumatology (Oxford) 2010;49(8):1540–1549.
77. Lin YC, Wang AG, Yen MY. Systemic lupus erythematosus-associated optic neuritis: clinical experience and literature review. Acta Ophthalmol 2009;87(2):204–210.
78. Jarius S, Jacobi C, de Seze J, et al. Frequency and syndrome specificity of antibodies to aquaporin-4 in neurological patients with rheumatic disorders. Mult Scler 2011;17(9): 1067–1073.
79. Asgari N, Jarius S, Laustrup H, et al. Aquaporin-4-autoimmunity in patients with systemic lupus erythematosus: a predominantly population-based study. Mult Scler 2018;24(3):331–339.
80. Llanos O, Hamzeh N. Sarcoidosis. Med Clin North Am. 2019;103(3): 527-34.
81. Leavitt RY, Fauci AS, Bloch DA, et al. The American College of Rheumatology L-1990 criteria for the classification of Wegener's granulomatosis. Arthritis Rheum 1990;33(8):1101–1107.
82. Ungprasert P, Matteson EL. Neurosarcoidosis. Rheum Dis Clin North Am 2017; 43(4):593–606.
83. Golnik KC. Infectious optic neuropathy. Semin Ophthalmol. 2002;17(1): 11–17.
84. Kahloun R, Abroug N, Ksiaa I, Mahmoud A, Zeghidi H, Zaouali S, Khairallah M. Infectious optic neuropathies: a clinical update. Eye Brain. 2015;7:59-81.
85. Diem R, Molnar F, Beisse F, Gross N, Drüschler K, Heinrich SP, Joachimsen L, Rauer S, Pielen A, Sühs K, Linker RA, et al. Treatment of optic neuritis with erythropoietin (TONE): a randomised, double-blind, placebo-controlled trial --- study protocol. BMJ Open. 2016 Mar 1;6(3):1-10.
86. Le Page E, Veillard D, Laplaud DA, et al. Oral versus intravenous high-dose methylprednisolone for treatment of relapses in patients with multiple sclerosis (COPOUSEP): A randomised, controlled, double-blind, non-inferiority trial. Lancet. 2015;386(9997):974e81.
87. Morrow SA, Fraser JA, Day C, et al. Effect of treating acute optic neuritis with bioequivalent oral vs intravenous corticosteroids: A randomized clinical trial. JAMA Neurol. 2018;75(6):690e6.
88. Menon V, Mehrotra A, Saxena R, Jaffery NF. Comparative evaluation of megadose methylprednisolone with dexamethasone for treatment of primary typical optic neuritis. Indian J Ophthalmol 2007;55:355–9.
89. Schilling S, Linker RA, Konig FB, et al.: Plasmaaustausch bei steroid resistenten Multiple-Sklerose-Schuben: Klinische Erfahrungen an 16 Patienten. Nervenarzt 2006; 77: 430–8.
90. Merle H, Olindo S, Jeannin S, et al.: Treatment of optic neuritis by plasma exchange (add-on) in neuromyelitis optica. Arch Ophthalmol 2012; 130: 858–62.
91. Cabre P, Mejdoubi M, Jeannin S, et al. Treatment of neuromyelitis optica with rituximab: a 2-year prospective multicenter study. J Neurol. 2018;265(4):917e25.

92. Wallach AI, Tremblay M, Kister I. Advances in the Treatment of Neuromyelitis Optica Spectrum Disorder. Neurol Clin. 2021; 39(1):35-49.
93. Jacobs LD, Beck RW, Simon JH, et al.: Intramuscular interferon beta-1a therapy initiated during a first demyelinating event in multiple sclerosis. CHAMPS Study Group. N Engl J Med 2000; 343: 898–904.
94. Kleiter I, Hellwig K, Berthele A, et al. Failure of natalizumab to prevent relapses in neuromyelitis optica. Arch Neurol. 2012;69(2):239e45.
95. Shimizu J, Hatanaka Y, Hasegawa M, et al. IFNb-1b may severely exacerbate Japanese optic-spinal MS in neuromyelitis optica spectrum. Neurology. 2010;75(16):1423e7.
96. Palace J, Leite MI, Nairne A, Vincent A. Interferon Beta treatment in neuromyelitis optica: Increase in relapses and aquaporin 4 antibody titers. Arch Neurol. 2010;67(8):1016e7.
97. Tselis A, Perumal J, Caon C, Hreha S, Ching W, Din M, *et al.* Treatment of corticosteroid refractory optic neuritis in multiple sclerosis patients with intravenous immunoglobulin. Eur J Neurol 2008;15:1163-7.
98. Rudick RA, Mi S, Sandrock AW, Jr.: LINGO-1 antagonists as therapy for multiple sclerosis: in vitro and in vivo evidence. Expert Opin Biol Ther 2008; 8: 1561–70.
99. Gresle MM, Liu Y, Kilpatrick TJ, Kemper D, Wu Q, Hu B, Fu Q, So K, Sheng G, Huang G, Pepinsky HB, Mi S. Blocking LINGO-1 in vivo reduces degeneration and enhances regeneration of the optic nerve. Mult Scler J Exp Transl Clin. 2016;19(2):1-13.
100. Demir CF, Taşcı İ. Multipl skleroz tedavisinde yeni ufuklar; Remiyelinizasyon ve nöroproteksiyon ilişkili tedaviler ve diğer tedavi yaklaşımları. Duman T, editör. Multipl Skleroz. 1. Baskı. Ankara: Türkiye Klinikleri; 2020; 152-158.