

BÖLÜM 11

TEMPOROMANDİBULAR EKLEM VE ROMATOLOJİK HASTALIKLAR

Derya ZENGİN METLİ¹

GİRİŞ

Temporomandibular eklem başın tek hareketli eklemi olup vücuttaki en karmaşık eklemlerden biridir. Temporomandibular eklem (TME) dış kulak yolunun hemen önünde, temporal kemiğin altındaki fossa articularis ile mandibulanın kondili arasında yer alır. Sıkı fibröz doku, artiküler disk, bağ ve kaslardan oluşur (1). Mandibulada kaput mandibula ve kollum mandibula eklemine alt kemik bölümünü; temporal kemiğin skuamoz (pars squamosa) parçasındaki mandibular fossa (glenoid fossa) ve artiküler tüberkül (genial tüberkül) üst kemik bölümünü oluşturur (2,3). Hem menteşe hareketi hem de kayma (translasyon) hareketini birlikte yapan tek eklem olup kişiden kişiye ve aynı kişinin sağ ve sol eklemlerinde değişkenlik gösterebilen birleşik bir eklemdir (4,5).

Temporomandibular eklem disfonksiyonu (TMD) çiğneme kasları, temporomandibular eklem ve ilgili yapıları içeren karmaşık bir problemdir. Genellikle bir yüz yarısında ağrı, çiğneme kaslarında palpasyonla hassasiyet, eklemden gelen klik sesi veya ağız açmada kısıtlılık gibi semptomlar göstermektedir (6).

Epidemiyolojik açıdan bakıldığında TMD genel popülasyonda sık görülmektedir. 20-40 yaş aralığında daha sık görülmekle birlikte her yaş aralığında karşılaşılan bir durumdur. TMD kadın cinsiyette daha sık görülür ayrıca kadınlarda klik sesi ile sert ve yumuşak doku hassasiyetinin erkeklere oranla daha sık olduğu yapılan çalışmalarda bildirilmiştir. Kadın cinsiyette görülen yüksek prevalans oranları muhtemel biyolojik psikolojik ve veya sosyal farklılıklar; hormonal ve bağ dokusunun cinsiyetler arası farklı özellikleri ile ilişkilendirilmiştir (7). 20-40 yaş

¹ Uzm. Dr., Maltepe Üniversitesi, Tıp Fakültesi Hastanesi, Fizik Tedavi ve Rehabilitasyon, dr.deryazengin@gmail.com

sındaki ilişkinin değerlendirilmesi, TME tutulumunun ilerlemesi ve oluşabilecek olumsuz sonuçların daha erken önlenebilmesi açısından büyük önem arz etmektedir.

TME tutulumu ile giden romatolojik hastalıkların tedavisinde oral steroid tedavisi, DMARD, NSAİ ve metotreksat kullanımı tek ya da değişik kombinasyonlar halinde kullanılmaktadır. Farklı tedavilerin kombinasyonuna eklenen fizyoterapinin tedavi etkinliğini ve sonuçlarını iyileştireceği düşünülmektedir. Bu noktada diş hekimleri fizyatristerler ve romatologlar arasında interdisipliner yaklaşım ile romatolojik hastalıklarda TME tutulumu erken teşhis ve tedavisi gerçekleştirilmelidir.

KAYNAKLAR

1. Okeson JP. Management of Temporomandibular Disorders and Occlusion 7th Edition, Mosby, St.Louis, Missouri 2012
2. Yengin E. Temporomandibular rahatsızlıklarda teşhis ve tedavi. Dilek Ofset Matbaacılık, 1. Baskı, İstanbul: 2000.
3. Gallo LM. Modeling of temporomandibular joint function using MRI and jaw-tracking technologies--mechanics. Cells Tissues Organs 2005;180(1):54-68.
4. Kavuncu V. Temporomandibular Eklem Disfonksiyon Sendromu, Romatizmal hastalıkların tanısı ve tedavisi.2002; p: 791-802.
5. Milam SB. Pathophysiology and epidemiology of TMJ. J Musculoskel Neuron Interact, 3(4):382-390, 2003.
6. Laskin DM. Etiology of the pain-dysfunction syndrome. J Am Dent Assoc. 1969;79(1):147-53.
7. Pedroni CR, De Oliveira AS, Guaratini MI (2003) Prevalence study of signs and symptoms of temporomandibular disorders in university students. J Oral Rehabil 30(3): 283-289.
8. LeResche L, Mancl L, Sherman J, Gandara B, Dworkin S (2003) Changes in temporomandibular pain and other symptoms across the menstrual cycle. Pain 106(3): 253-261.
9. Yu S, Xing X, Liang S, Ma Z, Li F, et al. (2009) Locally synthesized estrogen plays an important role in the development of TMD. Med Hypotheses 72(6): 720-722.
10. Magnusson T, Egermark I, Carlsson G (2000) A Longitudinal Epidemiologic Study of Signs and Symptoms of Temporomandibular Disorders from 15-35 Years of Age. J Orofac Pain 14(4): 310-319.
11. Wang J, Chao Y, Wan Q, Zhu Z (2008) The possible role of estrogen in the incidence of temporomandibular disorders. Med Hypotheses 71(4): 564-567.
12. Nardini L, Pavan C, Arveda N, Ferronato G, Manfredini D (2012) Psychometric features of temporomandibular disorders patients in relation to pain diffusion, location, intensity and duration. J Oral Rehabil 39(10): 737-743
13. Goldstein BH. Temporomandibular disorders: a review of current understanding. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1999; 88: 379-85
14. Könönen, M., Wenneberg, B. & Kallenberg, A. Craniomandibular disorders in rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis. A clinical study. Acta Odontol. Scand. 50, 281–287, <https://doi.org/10.3109/00016359209012774> (1992).
15. Chalmers, I. M. & Blair, G. S. Rheumatoid arthritis of the temporomandibular joint. A clinical and radiological study using circular tomography. Q. J. Med. 42, 369–386 (1973).
16. Ramos-Remus, C. et al. Temporomandibular joint osseous morphology in a consecutive sample of ankylosing spondylitis patients. Ann. Rheum. Dis. 56, 103–107, <https://doi.org/10.1136/>

ard.56.2.103 (1997).

17. Wenneberg, B., Kopp, S. & Hollender, L. Te temporomandibular joint in ankylosing spondylitis. Correlations between subjective, clinical, and radiographic features in the stomatognathic system and effects of treatment. *Acta Odontol. Scand.* 42, 165–173
18. Helenius, L. M. et al. Clinical and radiographic findings of the temporomandibular joint in patients with various rheumatic diseases. A case-control study. *Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod.* 99, 455–463
19. Scriveri SJ, Keith DA, Kaban LB. Temporomandibular disorders. *N Engl J Med.* 2008;359(25):2693-2705
20. Lim PF, Smith S, Bhalang K, et al. Development of temporomandibular disorders is associated with greater bodily pain experience. *Clin J Pain.* 2010;26(2):116-120
21. Sanders AE, Maixner W, Nackley AG, et al. Excess risk of temporomandibular disorder associated with cigarette smoking in young adults. *J Pain.* 2012;13(1):21-31
22. Etiological factors of temporomandibular joint disorders Shalender Sharma, D. S. Gupta, U. S. Pal, Sunit Kumar Jurel
23. Reiter S, Goldsmith C, Emodi-Perlman A, et al. Masticatory muscle disorders diagnostic criteria: the American Academy of Orofacial Pain versus the research diagnostic criteria/temporomandibular disorders. *J Oral Rehabil.* 2012;39(12):941-947.
24. Stohler CS. Muscle-related temporomandibular disorders. *J Orofac Pain.* 1999;13(4):273-284
25. de Santis TO, Motta LJ, Biasotto-Gonzalez DA, MesquitaFerrari RA, Fernandes KP, de Godoy CH, et al. Accuracy study of the main screening tools for temporomandibular disorder in children and adolescents. *J Bodyw Mov Ther* 2014; 18: 87-91
26. Okeson JP, de Leeuw R. Differential diagnosis of temporomandibular disorders and other orofacial pain disorders. *Dent Clin North Am.* 2011; 55(1):105-120.
27. Zakrzewska JM. Differential diagnosis of facial pain and guidelines for management. *Br J Anaesth.* 2013;111(1):95-104
28. Wright EF, Clark EG, Paunovich ED, Hart RG. Headache improvement through TMD stabilization appliance and self-management therapies. *Cranio.* 2006;24:104-11.
29. Correlation between TM joint disease and rheumatic diseases detected on bone scintigraphy and clinical factors Ji Suk Shim,Chulhan Kim,Jae Jun Ryu, Sung Jae Choi *Scientific Reports* (2020) 10:4547
30. Yengin E. Temporomandibular rahatsızlıklarda teşhis ve tedavi. Dilek Ofset Matbaacılık, 1. Baskı, İstanbul: 2000
31. Atsü SS, Ayhan-Ardic F. Temporomandibular disorders seen in rheumatology practices: a review. *Rheumatol Int* 2006;26: 781-787
32. Okeson JP. Management of temporomandibular disorders and occlusion. 5th ed., Mosby, 2003.
33. Rheumatoid Arthritis in Temporo-Mandibular Joint: A Review G Savtekin, AÖ Şehirli1
34. Mc Neill C. History and evolution of TMD concepts. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1997, 83: 51-60
35. Laskin D.M. Temporomandibular disorders: the past, present, and future. *Odontology.* 2007 Jul;95(1):10-15
36. Michelotti A, De Wijer A, Steenks M, Farella M. Home-exercise regimes for the management of non-specific temporomandibular disorders. *Journal of Oral Rehabilitation* 2005; 32: 779-785
37. Ventura, L., Reid, P. & Jan, R. Approach to Patients with Suspected Rheumatic Disease. *Prim. Care* 45, 169–180 (2018)
38. Resnick, D. Common disorders of synovium-lined joints: pathogenesis, imaging abnormalities, and complications. *AJR Am. J. Roentgenol.* 151, 1079–1093, (1988).
39. Celiker, R., Gökçe-Kutsal, Y. & Eryilmaz, M. Temporomandibular joint involvement in rheumatoid arthritis. Relationship with disease activity. *Scand. J. Rheumatol.* 24, 22–25 (1995).
40. Lin, Y. C. et al. Temporomandibular joint disorders in patients with rheumatoid arthritis. *J. Chin. Med. Assoc.* 70, 527–534

41. Hiz, O., Ediz, L., Ozkan, Y. & Bora, A. Clinical and magnetic resonance imaging findings of the temporomandibular joint in patients with rheumatoid arthritis. *J. Clin. Med. Res.* 4, 323–331 (2012).
42. O'Connor, R. C., Saleem, S. & Sidebottom, A. J. Prospective outcome analysis of total replacement of the temporomandibular joint with the TMJ Concepts system in patients with inflammatory arthritic diseases. *Br. J. Oral Maxillofac. Surg.* 54, 604–609, (2016).
43. Whyte AM, McNamara D, Rosenberg I, Whyte AW. Magnetic resonance imaging in the evaluation of temporomandibular joint disc displacement—a review of 144 cases. *Int J Oral Maxillofac Surg* 2006; 35: 696–703.
44. AT Assaf, B Kahl-Nieke, JFeddersen and CR Habermann et al. (2013) Is high-resolution ultrasonography suitable for the detection of temporomandibular joint involvement in children with juvenile idiopathic arthritis? *Dentomaxillofacial Radiology* 42, 20110379 The British Institute of Radiology
45. Goldstein, H. A. & Bloom, C. Y. Detection of degenerative disease of the temporomandibular joint by bone scintigraphy: concise communication. *J. Nucl. Med.* 21, 928–930 (1980).
46. Suh, M. S., Lee, W. W., Kim, Y. K., Yun, P. Y. & Kim, S. E. Maximum Standardized Uptake Value of (99m)Tc Hydroxymethylene Diphosphonate SPECT/CT for the Evaluation of Temporomandibular Joint Disorder. *Radiology* 280, 890–896, (2016).
47. Küsel, A., Pedersen, T. K., Herlin, T. & Gelineck, J. Contrast enhanced magnetic resonance imaging as a method to diagnose early inflammatory changes in the temporomandibular joint in children with juvenile chronic arthritis. *J. Rheumatol.* 25, 1406–1412 (1998).
48. Pedersen, T. K., Grønhoj, J., Melsen, B. & Herlin, T. Condylar condition and mandibular growth during early functional treatment of children with juvenile chronic arthritis. *Eur. J. Orthod.* 17, 385–394, (1995).
49. Demirel A, Kirnap M. Traditional and Up-to-date Treatment in Rheumatoid Arthritis. 2010;19(Şekil 1):74–84.
50. JR EDH. Epstein1990. *N Engl J Med.* 1990;322(18):1277–89.
51. Cosgarea R, Tristiu R, Dumitru RB, Arweiler NB, Rednic S, Sirbu CI, et al. Effects of non-surgical periodontal therapy on periodontal laboratory and clinical data as well as on disease activity in patients with rheumatoid arthritis. *Clin Oral Investig.* 2019;23(1):141–51.
52. Lindqvist E, Eberhardt K, Bendtzen K, et al. Prognostic laboratory markers of joint damage in rheumatoid arthritis. *Ann Rheum Dis* 2005; 64:196
53. Combe B, Dougados M, Goupille P, et al. Prognostic factors for radiographic damage in early rheumatoid arthritis: a multiparameter prospective study. *Arthritis Rheum* 2001; 44:1736.
54. Amos RS, Constable TJ, Crockson RA, et al. Rheumatoid arthritis: relation of serum C-reactive protein and erythrocyte sedimentation rates to radiographic changes. *Br Med J* 1977; 1:195.
55. Davis MJ, Dawes PT, Fowler PD, et al. Comparison and evaluation of a disease activity index for use in patients with rheumatoid arthritis. *Br J Rheumatol* 1990; 29:111.
56. Rivador RLC, Chaves HV, Val DR, Freitas AR, Lemos JC, Rodrigues JAG, et al. A Lectin from the Green Seaweed *Caulerpa Cupressoides* Reduces Mechanical HyperNociception and Inflammation in the Rat Temporomandibular Joint During ZymosanInduced Arthritis. *Int Immunopharmacol* 2014;21:3443.
57. Celiker R, GokceKutsal Y, Eryilmaz M. Temporomandibular Joint Involvement in Rheumatoid Arthritis. Relationship with Disease Activity. *Scand J Rheumatol* 1995;24:225.
58. Celiker R, GokceKutsal Y, Eryilmaz M. Temporomandibular Joint Involvement in Rheumatoid Arthritis. Relationship with Disease Activity. *Scand J Rheumatol* 1995;24:225
59. Kurtoglu C, Kurkcu M, Sertdemir Y, Ozbek S, Gürbüz CC. Temporomandibular Disorders in Patients with Rheumatoid Arthritis: A Clinical Study. *Niger J Clin Pract* 2016;19:71520
60. Kent JN, Carlton DM, Zide MF. Rheumatoid Disease and Related Arthropathies: Surgical Rehabilitation of the Temporomandibular Joint. *Oral Surg Oral Med Oral Pathol* 1988;61:42339
61. Atsu SS, AyhanArdic F. Temporomandibular Disorders Seen in Rheumatology Practices: A Review. *Rheumatol Int* 2006;26:7817

62. Lin YC, Hsu ML, Yang JS, Liang TH, Chou SL, Lin HY. Temporomandibular Joint Disorders in Patients with Rheumatoid Arthritis. *J Chin Med Assoc* 2007;70:52734
63. BessaNogueira RV, Vasconcelos BC, Duarte AP, Góes PS, Bezerra TP. Targeted assessment of the temporomandibular joint in patients with rheumatoid arthritis. *J Oral Maxillofac Surg* 2008;66:180411.
64. Gilheaney Ó, Zgaga L, Harpur I, Sheaf G, Kiefer L, Béchet S, et al. Dysphagia. The Prevalence of Oropharyngeal Dysphagia in Adults Presenting with Temporomandibular Disorders Associated with Rheumatoid Arthritis: A Systematic Review and Metaanalysis. 2017
65. Guidelines for the management of rheumatoid arthritis: 2002 update. *ArthritisRheum* 2002; 46: 328-346.
66. O'Dell JR. Therapeutic strategies for rheumatoid arthritis. *N Engl J Med*2004; 350: 2591-2602.
67. Sokka T, Kautiainen H, Häkkinen A, Hannonen P. Radiographic progression is getting milder in patients with early rheumatoid arthritis. Results of 3 cohortsover 5 years. *J Rheumatol* 2004; 31:1073.
68. Smolen JS, Landewé R, Breedveld FC, et al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological diseasemodifying antirheumatic drugs: 2013 update. *Ann Rheum Dis* 2014; 73:492.
69. Ramos-Remus C, Major P, Gomez-Vargas A, et al. Temporomandibular joint osseous morphology in a consecutive sample of ankylosing spondylitis patients. *Ann Rheum Dis* 1997;56:103–7.
70. Locher MC, Felder M, Sailer HF. Involvement of the temporomandibular joints in ankylosing spondylitis (Bechterew's disease). *J Craniofac Surg* 1996;24:205–13.
71. Deesomchok Q, Tumrasvin T. Clinical study of Thai patients with ankylosing spondylitis. *J Clin Rheumatol* 1985;4:76–82.
72. Manemi RV, Fasanmade A, Revington PJ. Bilateral ankylosis of the jaw treated with total alloplastic replacement using the TMJ concepts system in a patient with ankylosing spondylitis. *Br J Oral and Maxillofac Surg* 2009;47:159–61.
73. Ghosh A, Kole A, Devi GI, et al. Treatment of ankylosing spondylitis with special reference to biologics: single centre experience. *J Indian Rheumatol Assoc* 2004;12:54–7
74. Davidson C, Wojtulewski JA, Bacon PA, et al. Temporo-mandibular joint disease in ankylosing spondylitis. *Ann Rheum Dis* 1975;34:87–91
75. CASE REPORT Temporomandibular joint involvement in ankylosing spondylitis Pallak Aro-ra,1 Janardhan Amarnath,2 Setru Veerabhadrapa Ravindra,3 Mandeep Rallan)
76. Aytekin E, Caglar NS, Ozgonenel L, et al. Home-based exercise therapy in patients with ankylosing spondylitis: effects on pain, mobility, disease activity, quality of life, and respiratory functions. *Clinical rheumatology* 2012;31:91-7
77. Wang CY, Chiang PY, Lee HS, Wei JC. The effectiveness of exercise therapy for ankylosing spondylitis: a review. *Int J Rheum Dis*. 2009 Sep;12(3):207-10.
78. Sari Ğ, Öztürk MA, Akkoç N. Treatment of ankylosing spondylitis. *Turk J Med Sci*. 2015;45(2):416-30
79. Baraliakos X, Brandt J, Listing J, Haibel H, Sörensen H, Rudwaleit M, et al. Outcome of patients with active ankylosing spondylitis after two years of therapy with etanercept: clinical and magnetic resonance imaging data. *Arthritis Rheum*. 2005 Dec 15;53(6):856-63. doi: 10.1002/art.21588. PMID: 16342093.
80. Derk, C.T., Jimenez, S.A. (2003). Systemic sclerosis: current views of its pathogenesis. *Autoimmun Rev*, 2 (4), 181-191.
81. Mayes, M.D.; Lacey, J.V., Jr.; Beebe-Dimmer, J.; Gillespie, B.W.; Cooper, B.; Laing, T.J.; Schottenfeld, D. Prevalence, incidence, survival, and disease characteristics of systemic sclerosis in a large US population. *Arthritis Rheum*. 2003, 48, 2246–2255.
82. Jelaska, A.; Arakawa, M.; Broketa, G.; Korn, J.H. Heterogeneity of collagen synthesis in normal and systemic sclerosis skin fibroblasts. Increased proportion of high collagen-producing cells

- in systemic sclerosis fibroblasts. *Arthritis Rheum.* 1996, 39, 1338–1346.
83. Jinnin, M. Mechanisms of skin fibrosis in systemic sclerosis. *J. Dermatol.* 2010, 37, 11–25.
 84. Chung, L.; Lin, J.; Furst, D.E.; Fiorentino, D. Systemic and localized scleroderma. *Clin. Dermatol.* 2006, 24, 374–392.
 85. Gupta, R.A.; Fiorentino, D. Localized scleroderma and systemic sclerosis: Is there a connection? *Best Pract. Res. Clin. Rheumatol.* 2007, 21, 1025–1036.
 86. Salem, B.; Rim, B.H.; Sihem, B.K.; Maher, B. Oral manifestations of systemic sclerosis. *Pan. Afr. Med. J.* 2013, 16, 114.
 87. Singh, P.P.; Kapoor, S.; Bither, S. Oral manifestations in progressive systemic sclerosis: Case report. *J. Dent. Oral Hyg.* 2011, 3, 89–94
 88. Haers, P.E.; Sailer, H.F. Mandibular resorption due to systemic sclerosis. Case report of surgical correction of a secondary open bite deformity. *Int. J. Oral Maxillofac. Surg.* 1995, 24, 261–267.
 89. Taveras, J.M. The interpretation of radiographs. In *Disorders of the Temporomandibular Joint*; Schwartz, L., Ed.; W.B. Saunders: Philadelphia, PA, USA, 1959; pp. 154–162.
 90. Aliko, A.; Ciancaglini, R.; Alushi, A.; Tafaj, A.; Ruci, D. Temporomandibular joint involvement in rheumatoid arthritis, systemic lupus erythematosus and systemic sclerosis. *Int. J. Oral Maxillofac. Surg.* 2011, 40, 704–709.
 91. Ferreira, E.L.; Christmann, R.B.; Borba, E.F.; Borges, C.T.; Siqueira, J.T.; Bonfa, E. Mandibular function is severely impaired in systemic sclerosis patients. *J. Orofac. Pain* 2010, 24, 197–202.
 92. Tecco, S.; Crincoli, V.; Di Bisceglie, B.; Saccucci, M.; Macri, M.; Polimeni, A.; Festa, F. Signs and symptoms of temporomandibular joint disorders in Caucasian children and adolescents. *Cranio* 2011, 29, 71–79.
 93. Sidebottom, A.J.; Salha, R. Management of the temporomandibular joint in rheumatoid disorders. *Br. J. Oral Maxillofac. Surg.* 2013, 51, 191–198.
 94. Nagy, G.; Kovács, J.; Zeher, M.; Czirják, L. Analysis of the oral manifestations of systemic sclerosis. *Oral Surg. Oral Med. Oral Pathol.* 1994, 77, 141–146.
 95. Fernández-Codina A, Walker KM, Pope JE. Treatment Algorithms for Systemic Sclerosis According to Experts. *Arthritis Rheumatol* 2018;70(11):1820-8.
 96. Kowal-Bielecka O, Fransen J, Avouac J, Becker M ve ark. Update of EULAR recommendations for the treatment of systemic sclerosis. *Ann Rheum Dis* 2017;76(8):1327-39.
 97. Brunner HI, Gladman DD, Ibanez D, Urowitz MD, Silverman ED. Difference in disease features between childhood-onset and adult-onset systemic lupus erythematosus. *Arthritis Rheum.* 2008;58:556–562.
 98. Morgan TA, Watson L, McCann LJ, Beresford MW. Children and adolescents with SLE: not just little adults. *Lupus.* 2013;22:1309–1319.
 99. Lim KL, Abdul-Wahab R, Lowe J, Powell RJ. Muscle biopsy abnormalities in systemic lupus erythematosus: correlation with clinical and laboratory parameters. *Ann Rheum Dis.* 1994;53:178–182
 100. Abdwani R, Rizvi SG, El-Nour I. Childhood systemic lupus erythematosus in Sultanate of Oman: demographics and clinical analysis. *Lupus.* 2008;17:683– 686.
 101. Hilario MO, Yamashita H, Lutti D, Len C, Terreri MT, Lederman H. Juvenile idiopathic inflammatory myopathies: the value of magnetic resonance imaging in the detection of muscle involvement. *Sao Paulo Med J.* 2000;118:35–40.
 102. Padeh S, Passwell JH. Intraarticular corticosteroid injection in the management of children with chronic arthritis. *Arthritis Rheum.* 1998;41:1210–1214
 103. Stichweh D, Pascual V. Systemic lupus erythematosus in children. *An Pediatr (Barc).* 2005;63:321–329
 104. Vargervik K. Morphologic evidence of muscle influence on dental arch width. *Am J Orthod.* 1979;76:21–28.
 105. Kiliaridis S, Georgiakaki I, Katsaros C. Masseter muscle thickness and maxillary dental arch width. *Eur J Orthod.* 2003;25:259–263.

106. Jonsson R, Lindvall AM, Nyberg G. Temporomandibular joint involvement in systemic lupus erythematosus. *Arthritis Rheum.* 1983;26:1506–1510.
107. Liebling MR, Gold RH. Erosions of the temporomandibular joint in systemic lupus erythematosus. *Arthritis Rheum.* 1981;24:948–950.
108. Gerbracht D, Shapiro L. Temporomandibular joint erosions in systemic lupus erythematosus. *Arthritis Rheum.* 1982;25:597.
109. Caramaschi P, Biasi D, Dal Forno I, Adami S. Osteonecrosis in systemic lupus erythematosus: an early, frequent, and not always symptomatic complication. *Autoimmune Dis.* 2012;2012:725249
110. Improvement P. Systemic Lupus Erythematosus. *Ann Intern Med.* 2020;172(11):81–96.
111. Rahman A, Underwood M, Carnes D. Fibromyalgia. *Bmj.* 2014;348:g1224
112. Oğuz H, Çakırbay H, Yanık B. Ağrılı Kas Sendromları. *Tıbbi Rehabilitasyon, Nobel Tıp Kitabevi, İstanbul.* 2015:1221-38
113. Ruparella PB, Shah DS, Ruparella K, et al. (2014) Bilateral TMJ Involvement in Rheumatoid Arthritis. *Case Rep Dent* 2014: 262430.
114. Sodhi A, Naik S, Pai A, et al. (2015) Rheumatoid arthritis affecting temporomandibular joint. *Contemp Clin Dent* 6: 124–127.
115. Chebbi R, Khalifa HB, Dhidah M (2016) Temporomandibular joint disorder in systemic sclerosis: a case report. *Pan Afr Med J* 25: 164.
116. Cordeiro PC, Guimaraes JP, de Souza VA, et al. (2016) Temporomandibular joint involvement in rheumatoid arthritis patients: association between clinical and tomographic data. *Acta Odontol Latinoam* 29: 123–129.
117. Ince DO, Ince A, Moore TL (2000) Effect of methotrexate on the temporomandibular joint and facial morphology in juvenile rheumatoid arthritis patients. *Am J Orthod Dentofacial Orthop* 118: 75–83.
118. Kopp S, Alstergren P, Ernestam S, et al. (2005) Reduction of temporomandibular joint pain after treatment with a combination of methotrexate and infliximab is associated with changes in synovial fluid and plasma cytokines in rheumatoid arthritis. *Cells Tissues Organs* 180: 22–30
119. Shaffer SM, Brisme JM, Sizer PS, Courtney CA. Temporomandibular disorders. Part 2: conservative management. *J Man Manip Ther* 2014; 22 (1): 13-23.)
120. Furto ES, Cleland JA, Whitman JM, Olson KA. Manual physical therapy interventions and exercise for patients with temporomandibular disorders. *Cranio* 2006; 24 (4): 283- 291
121. Güreşer G. Temporomandibular eklem hastalıkları. *Fiziksel Tıp Dergisi* 2003; 6(2) :37-45
122. Gezer İA, Levendoğlu F. Temporomandibular eklem rahatsızlıklarının sınıflandırılması, tanı ve tedavisi. *Genel Tıp Derg.* 2016; 26(1): 34-40