

GİRİŞ

Protez kapak endokarditi (PKE) kalp kapağı replasmanının yüksek ölüm oranlarıyla ilişkili ciddi bir komplikasyondur. PKE, hem biyoprotez hem mekanik kalp kapağı olan hastalarda izlenebilir. Epidemiyolojik çalışmalara göre gelişmiş ülkelerde tüm infektif endokardit vakalarının %10 ila %30 kadarını PKE meydana getirir (1-4). Kapak protezi olan hastaların yüzde 1 ila 6'sında görülür (5). Genel olarak, cerrahi kapak replasmanı yapılan hastalarda PKE, aortik ve mitral bölgelerde eşit sıklıkta meydana gelir (6-9).

ERKEN ENFEKSİYON

Erken PKE'de (cerrahi sonrası ilk 60 gün), mikroorganizmalar protez kapağı doğrudan intraoperatif kontaminasyon yoluyla veya cerrahi sonrası erken dönemde hematogen yayılım yoluyla enfekte eder. Kapak implantasyonundan hemen sonra kapak sütür halkası, kardiyak anulus ve asma sütürleri henüz endotel ile kaplanmamıştır; bu nedenle, organizmaların protez-halka arayüzüne ve dikiş yolları boyunca perivalvüler dokuya doğrudan erişimi kolaylaşmıştır. Bu yapılar, organizmaların yapışabileceği fibronektin ve fibrinojen gibi konakçı proteinlerle kaplıdır. Perivalvüler apseler, protez kapaklarda özellikle yaygındır, çünkü halka, özellikle erken PKE'de hem mekanik hem de biyoprostetik kapakları içeren birincil enfeksiyon bölgesidir (10).

¹ Arş. Gör., Fırat Üniversitesi Hastanesi, erkan.cecen@firat.edu.tr, ORCID iD: 0009-0003-1132-1352

² Uzm. Dr., Elazığ Fethi Sekin Şehir Hastanesi, Kardiyoloji Kliniği, mehdikarasu@yahoo.com, ORCID iD: 0000-0003-1713-3451



KAYNAKLAR

1. Fowler VG Jr, Miro JM, Hoen B, et al: Staphylococcus aureus endocarditis: A consequence of medical progress. *JAMA* 293:3012, 2005.
2. Martin-Davila P, Fortun J, Navas E, et al: Nosocomial endocarditis in a tertiary hospital: An increasing trend in native valve cases. *Chest* 128:772, 2005.
3. Wang A, Athan E, Pappas PA, et al: Contemporary clinical profile and outcome of prospective valve endocarditis. *JAMA* 297:1354, 2007.
4. Habib G, Tribouilloy C, Thuny F, et al: Prosthetic valve endocarditis: Who needs surgery? A multicentre study of 104 cases. *Heart* 91 :954, 2005.
5. Vongpatanasin W, Hillis LD, Lange RA. Prosthetic heart valves. *N Engl J Med* 1996; 335:407.
6. Grover FL, Cohen DJ, Oprian C, et al. Determinants of the occurrence of and survival from prosthetic valve endocarditis. Experience of the Veterans Affairs Cooperative Study on Valvular Heart Disease. *J Thorac Cardiovasc Surg* 1994; 108:207.
7. Ivvert TS, Dismukes WE, Cobbs CG, et al. Prosthetic valve endocarditis. *Circulation* 1984; 69:223.
8. Calderwood SB, Swinski LA, Waternaux CM, et al. Risk factors for the development of prosthetic valve endocarditis. *Circulation* 1985; 72:31.
9. Bloomfield P, Wheatley DJ, Prescott RJ, Miller HC. Twelve-year comparison of a Bjork-Shiley mechanical heart valve with porcine bioprostheses. *N Engl J Med* 1991; 324:573.
10. Carpenter JL, Perivalvular extension of infection in patients with infectious endocarditis. *Rev Infect Dis.* 1991;13(1):127.
11. Fauchier L, Bisson A, Herbert J, et al. Incidence and outcomes of infective endocarditis after transcatheter aortic valve implantation versus surgical aortic valve replacement. *Clin Microbiol Infect* 2020; 26:1368.
12. Kolte D, Goldsweig A, Kennedy KF, et al. Comparison of Incidence, Predictors, and Outcomes of Early Infective Endocarditis after Transcatheter Aortic Valve Implantation Versus Surgical Aortic Valve Replacement in the United States. *Am J Cardiol* 2018; 122:2112.
13. Butt JH, Ihlemann N, De Backer O, et al. Long-Term Risk of Infective Endocarditis After Transcatheter Aortic Valve Replacement. *J Am Coll Cardiol* 2019; 73:1646.
14. Moriyama N, Laakso T, Biancari F, et al. Prosthetic valve endocarditis after transcatheter or surgical aortic valve replacement with a bioprosthesis: results from the FinnValve Registry. *EuroIntervention* 2019; 15:e500.
15. Wang A, Athan E, Pappas PA, et al. Contemporary clinical profile and outcome of prosthetic valve endocarditis. *JAMA* 2007; 297:1354.
16. Karchmer AW, Longworth DL: Infections of intracardiac devices. *Cardiol Clin* 21 :253, 2003.
17. Karchner AW, Longworth DL: Infections of intracardiac devices, *Infect Dis Clin North Am* 16:477; Rivas P, Alonso J, et al: The impact of hospital-acquired infections on the microbial etiology and prognosis of late-onset prosthetic valve endocarditis. *Chest* 128:1174, 2006; Wang A, Athan E, Pappas P, et al: Contemporary clinical profile and outcome of prosthetic valve endocarditis. *JAMA* 297:1354, 2007'den alınan veriler.
18. Ben Ismail M, Hannachi N, Abid F, et al. Prosthetic valve endocarditis. A survey. *Br Heart J* 1987; 58:72.
19. Masur H, Johnson WD Jr. Prosthetic valve endocarditis. *J Thorac Cardiovasc Surg* 1980; 80:31.
20. Tornos P, Sanz E, Permanyer-Miralda G, et al. Late prosthetic valve endocarditis. Immediate and long-term prognosis. *Chest* 1992; 101:37.
21. Keyser DL, Biller J, Coffman TT, Adams HP Jr. Neurologic complications of late prosthetic valve endocarditis. *Stroke* 1990; 21:472.
22. Habib G, Lancellotti P, Antunes MJ, et al. 2015 ESC Guidelines for the management of infective endocarditis: The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC). Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM). *Eur Heart J* 2015; 36:3075.



23. Baddour LM, Wilson WR, Bayer AS, et al. Infective Endocarditis in Adults: Diagnosis, Antimicrobial Therapy, and Management of Complications: A Scientific Statement for Healthcare Professionals From the American Heart Association. *Circulation* 2015; 132:1435.
24. Lindner JR, Case RA, Dent JM, et al. Diagnostic value of echocardiography in suspected endocarditis. An evaluation based on the pretest probability of disease. *Circulation* 1996; 93:730.
25. Nishimura RA, Otto CM, Bonow RO, et al. 2014 AHA/ACC guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol* 2014; 63:e57.
26. Holland TL, Arnold C, Fowler VG Jr. Clinical management of *Staphylococcus aureus* bacteremia: a review. *JAMA* 2014; 312:1330.
27. Colen TW, Gunn M, Cook E, Dubinsky T. Radiologic manifestations of extra-cardiac complications of infective endocarditis. *Eur Radiol* 2008; 18:2433.
28. Duval X, Jung B, Klein I, et al. Effect of early cerebral magnetic resonance imaging on clinical decisions in infective endocarditis: a prospective study. *Ann Intern Med* 2010; 152:497.
29. Meshaal MS, Kassem HH, Samir A, et al. Impact of routine cerebral CT angiography on treatment decisions in infective endocarditis. *PLoS One* 2015; 10:e0118616.
30. Chakraborty T, Scharf E, DeSimone D, et al. Variable Significance of Brain MRI Findings in Infective Endocarditis and Its Effect on Surgical Decisions. *Mayo Clin Proc* 2019; 94:1024.
31. Ahn Y, Joo L, Suh CH, et al. Impact of Brain MRI on the Diagnosis of Infective Endocarditis and Treatment Decisions: Systematic Review and Meta-Analysis. *AJR Am J Roentgenol* 2022; 218:958.
32. John MD, Hibberd PL, Karchmer AW, et al. *Staphylococcus aureus* prosthetic valve endocarditis: optimal management and risk factors for death. *Clin Infect Dis* 1998; 26:1302.
33. Nettles RE, McCarty DE, Corey GR, et al. An evaluation of the Duke criteria in 25 pathologically confirmed cases of prosthetic valve endocarditis. *Clin Infect Dis* 1997; 25:1401.
34. Daniel WG, Mügge A, Martin RP, et al. Improvement in the diagnosis of abscesses associated with endocarditis by transesophageal echocardiography. *N Engl J Med* 1991; 324:795.
35. Kim IC, Chang S, Hong GR, et al. Comparison of Cardiac Computed Tomography With Transesophageal Echocardiography for Identifying Vegetation and Intracardiac Complications in Patients With Infective Endocarditis in the Era of 3-Dimensional Images. *Circ Cardiovasc Imaging* 2018; 11:e006986.
36. Koneru S, Huang SS, Oldan J, et al. Role of preoperative cardiac CT in the evaluation of infective endocarditis: comparison with transesophageal echocardiography and surgical findings. *Cardiovasc Diagn Ther* 2018; 8:439.
37. Sims JR, Anavekar NS, Chandrasekaran K, et al. Utility of cardiac computed tomography scanning in the diagnosis and pre-operative evaluation of patients with infective endocarditis. *Int J Cardiovasc Imaging* 2018; 34:1155.
38. Jung B, Rouzet F, Brochet E, Duval X. Cardiac Imaging of Infective Endocarditis, Echo and Beyond. *Curr Infect Dis Rep* 2017; 19:8.
39. Pizzi MN, Roque A, Cuéllar-Calabria H, et al. 18F-FDG-PET/CTA of Prosthetic Cardiac Valves and Valve-Tube Grafts: Infective Versus Inflammatory Patterns. *JACC Cardiovasc Imaging* 2016; 9:1224.
40. Carrel T, Eberle B. Candida endocarditis after TAVI. *N Engl J Med* 2019; 380:e1, DOI: 10.1056/NEJMicm1809948
41. Francioli P, Ruch W, Stamboulion D. Treatment of streptococcal endocarditis with a single daily dose of ceftriaxone and netilmicin for 14 days: a prospective multicenter study. *Clin Infect Dis* 1995;21:1406–1410
42. Francioli P, Etienne J, Hoigne R, Thys JP, Gerber A. Treatment of streptococcal endocarditis with a single daily dose of ceftriaxone sodium for 4 weeks. Efficacy and outpatient treatment feasibility. *JAMA* 1992;267:264–267.
43. Chirouze C, Cabell CH, Fowler VG Jr, Khayat N, Olaison L, Miro JM, Habib G, Abrutyn E, Eykyn S, Corey GR, Selton-Suty C, Hoen B. Prognostic factors in 61 cases of *Staphylococcus aureus* prosthetic valve infective endocarditis from the International Collaboration on Endocarditis registry database. *Clin Infect Dis* 2004;38:1323–1327