

## Bölüm 53

# TOTAL DİZ ARTROPLASTİSİ SONRASI GELİŞEN PERİPROSTETİK KIRIKLARA YAKLAŞIM

Mehmet Orçun AKKURT  
Vedat BİÇİCİ  
Bünyamin ARI<sup>1</sup>

Total diz artroplastisi (TDA) dejeneratif eklem hastalıklarına bağlı gelişen ağrı ve fonksiyonel bozukluk için etkili bir tedavi yöntemidir. Total diz artroplastisi sık yapılan bir ameliyat olup sayısı artmaya devam etmektedir. Total diz artroplastisi çevresindeki periprostetik kırıklar nispeten nadir görülen bir komplikasyon olmasına karşın kompleks yaralanmalar oldukları için cerrahın artroplastisiyle birlikte travma ve rekonstrüktif tekniklere de aşina olması gerekir. İnsanların beklenen yaşam sürelerinde ve yaşlı hastaların fonksiyonel taleplerindeki artış periprostetik kırıkların görülme sıklığında artışa yol açabilir. Suprakondiler femur kırığı diz çevresi periprostetik kırıklar içinde en sık görülendir. Bu bölümde total artroplastisi çevresinde gelişen periprostetik kırıklar için görülme sıklığı, risk faktörleri, sınıflandırma, inceleme ve tedavi seçenekleri gözden geçirilecektir.

## GİRİŞ

Yıllık olarak yapılan diz artroplastilerinin sayısı dramatik bir şekilde artmaktadır. Birleşik Krallık'ta, 2012 yılında 90.842 diz protezi uygulanmış ve bu sayı bir önceki yıla göre % 7.3 oranında bir artışı göstermiştir (1). Bu yüzden primer ve revizyon total diz artroplastisi ile ilişkili diz çevresindeki periprostetik kırık görülme sıklığında da artış beklenmektedir. Bu kırıklar tedavilerinin karmaşık olmasının yanında zaman ve kaynak tüketimine de neden olur. Kilitli plak ile osteosentez, çivileme ve eksternal fiksasyon teknikleriyle birlikte endoprotezler gibi yeni tedavi yöntemleri ile teknik olarak bu zorlu yaralanmalarda sonuçları iyileştirmiştir. Bu bölümün amacı: diz çevresi periprostetik kırıklarının görülme ve tekrarlama sıklığını gözden geçirmek, güncel sınıflandırma sistemleri ile birlikte bu kırıkların

<sup>1</sup> Op. Dr., Yenimahalle Eğitim ve Araştırma Hastanesi, doctorbunyaminari@hotmail.com



**Şekil 12.** Hastanın Eksternal Fiksator çıktıktan sonraki Ön-Arka grafisi

## **KAYNAKLAR**

1. NJR Steering Committee. National Joint Registry for England, Wales and Northern Ireland: 10th Annual Report, Hemel Hempstead, UK. 2013.
2. Aaron RK, Scot R. Supracondylar fracture of the femur after total knee arthroplasty. *Clin Orthop Relat Res.* 1987;219:136-9.
3. Merkel KD, Johnson EW. Supracondylar fracture of the femur after total knee arthroplasty. *J Bone Joint Surg Am.* 1986;68:29-43.
4. Rorabeck CH, Taylor JW. Classification of periprosthetic fractures complicating total knee arthroplasty. *Orthop Clin North Am.* 1999;30:209-14.
5. Healy WL, Siliski JM, Incavo SJ. Operative treatment of distal femoral fractures proximal to total knee replacements. *J Bone Joint Surg Am.* 1993;75:27-34.
6. Inglis AE, Walker PS. Revision of failed knee replacements using fixed-axis hinges. *J Bone Joint Surg (Br).* 1991;73:757-61.
7. Ritter MA, Faris PM, Keating EM. Anterior femoral notching and ipsilateral supracondylar femur fracture in total knee arthroplasty. *J Arthroplasty.* 1988;3:185-7.
8. Schröder HM, Berthelsen A, Hassani G, et al. Cementless porous-coated total knee arthroplasty: 10-year results in a consecutive series. *J Arthroplasty.* 2001;16:559-67.
9. Meek RMD, Norwood T, Smith R, et al. The risk of peri-prosthetic fracture after primary and revision total hip and knee replacement. *J Bone Joint Surg (Br).* 2011;93:96-101.
10. Felix NA, Stuart MJ, Hanssen AD. Periprosthetic fractures of the tibia associated with total knee arthroplasty. *Clin Orthop Relat Res.* 1997;345:113-24.
11. Chalidis BE, Tsiroidis E, Tragas AA, et al. Management of periprosthetic patellar fractures. A systematic review of literature. *Injury.* 2007;38:714-24.
12. Ortiguera CJ, Berry DJ. Patellar fracture after total knee arthroplasty. *J Bone Joint Surg Am.* 2002;84:532-40.
13. Engh GA, Ammeen DJ. Periprosthetic fractures adjacent to total knee implants. Treatment and clinical results. *J Bone Joint Surg Am.* 1997;79:1100-13.
14. Beals RK, Tower SS. Periprosthetic fractures of the femur. An analysis of 93 fractures. *Clin Orthop Relat Res.* 1996;327:238-46. *142 Curr Rev Musculoskelet Med (2014) 7:136-144*
15. Porsch M, Galm R, Hovy L, et al. (Total femur replacement following multiple periprosthetic

- fractures between ipsilateral hip and knee replacement in chronic rheumatoid arthritis. Case report of 2 patients). *Z Orthop Ihre Grenzgeb.* 1996;134:16–20.
16. Della Rocca G. Periprosthetic fractures about the knee—an overview. *J Knee Surg.* 2013;26:3–8.
  17. Platzer P, Schuster R, Aldrian S, et al. Management and outcome of periprosthetic fractures after total knee arthroplasty. *J Trauma.* 2010;68:1464–70.
  18. Culp RW, Schmidt RG, Hanks G, et al. Supracondylar fracture of the femur following prosthetic knee arthroplasty. *Clin Orthop Relat Res.* 1987;222:212–22.
  19. Lesh ML, Schneider DJ, Deol G, et al. The consequences of anterior femoral notching in total knee arthroplasty. A biomechanical study. *J Bone Joint Surg Am.* 2000;82-A:1096–101.
  20. Zalzal P, Backstein D, Gross AE, et al. Notching of the anterior femoral cortex during total knee arthroplasty characteristics that increase local stresses. *J Arthroplasty.* 2006;21:737–43.
  21. Ritter MA, Thong AE, Keating EM, et al. The effect of femoral notching during total knee arthroplasty on the prevalence of postoperative femoral fractures and on clinical outcome. *J Bone Joint Surg Am.* 2005;87:2411–4.
  22. Gujarathi N, Putti AB, Abboud RJ, et al. Risk of periprosthetic fracture after anterior femoral notching. *Acta Orthop.* 2009;80:553–6.
  23. Singh JA, Jensen M, Lewallen D. Predictors of periprosthetic fracture after total knee replacement. *Acta Orthop.* 2013;84:170–7.
  24. Charlson ME, Pompei P, Ales KL, et al. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chronic Dis.* 1987;40:373–83.
  25. Engh GA, Rorabeck CH, eds. Revision total knee arthroplasty. Baltimore, Williams & Wilkins, Philadelphia. 1997;275–95.
  26. Kim K-I, Egol KA, Hozack WJ, et al. Periprosthetic fractures after total knee arthroplasties. *Clin Orthop Relat Res.* 2006;446: 167–75.
  27. Parvizi J, Gehrke T, Chen AF. Proceedings of the international consensus on periprosthetic joint infection. *Bone Joint J.* 2013;95- B:1450–2.
  28. Garnavos C, Rafiq M, Henry APJ. Treatment of femoral fracture above a knee prosthesis: 18 cases followed 0.5–14 years. *Acta Orthop.* 1994;65:610–4.
  29. Moran MC, Brick GW, Sledge CB, et al. Supracondylar femoral fracture following total knee arthroplasty. *Clin Orthop Relat Res.* 1996;324:196–209.
  30. Delpont PH, Van Audekercke R, Martens M, et al. Conservative treatment of ipsilateral supracondylar femoral fracture after total knee arthroplasty. *J Trauma.* 1984;24:846–9.
  31. Ginther JR, Ritter MA. Femoral Periprosthetic Fractures: Rush Rods. In: *Surgical Techniques in Total Knee Arthroplasty.* New York: Springer; 2002. p. 553–7.
  32. Ritter MA, Keating EM, Faris PM, et al. Rush rod fixation of supracondylar fractures above total knee arthroplasties. *J Arthroplasty.* 1995;10:213–6.
  33. Sarmah SS, Patel S, Reading G, et al. Periprosthetic fractures around total knee arthroplasty. *Ann R Coll Surg Engl.* 2013;94:302–7.
  34. Currall VA, Kulkarni M, Harries WJ. Retrograde nailing for supracondylar fracture around total knee replacement: a compatibility study using the Trigen supracondylar nail. *Knee.* 2007;14: 208–11.
  35. Kregor PJ, Hughes JL, Cole PA. Fixation of distal femoral fractures above total knee arthroplasty utilizing the Less Invasive Stabilization System (LISS). *Injury.* 2001;32 Suppl 3:SC64–75.
  36. Ruchholtz S, Tomás J, Gebhard F, et al. Periprosthetic fractures around the knee—the best way of treatment. *Euro Orthop Traumatol.* 2013;4:93–102.
  37. Short WH, Hootnick DR, Murray DG. Ipsilateral supracondylar femur fractures following knee arthroplasty. *Clin Orthop Relat Res.* 1981;158:111–6.
  38. Weber D, Peter RE. Distal femoral fractures after knee arthroplasty. *Int Orthop.* 1999;23:236–9.
  39. Hassan S, Swamy GN, Malhotra R, et al. Periprosthetic fracture of the distal femur after total knee arthroplasty; prevalence and outcomes following treatment. *J Bone Joint Surg (Br).* 2012;94-B Suppl 24:6.
  40. Norrish AR, Jibri ZA, Hopgood P. The LISS plate treatment of supracondylar fractures above a

- total knee replacement: a casecontrol study. *Acta Orthop Belg.* 2009;75:642–8.
41. Ebraheim NA, Sochacki KR, Liu X, et al. Locking plate fixation of periprosthetic femur fractures with and without cerclage wires. *Orthop Surg.* 2013;5:183–7.
  42. Hoffman MF, Jones CB, Sietsema DL, et al. Outcome of periprosthetic distal femoral fractures following knee arthroplasty. *Injury.* 2012;43:1084–9.
  43. Ehlinger M, Adam P, Abane L, et al. Treatment of periprosthetic femoral fractures of the knee. *Knee Surg Sports Traumatol Arthr.* 2011;19:1473–89.
  44. Bezwada HP, Neubauer P, Baker J, et al. Periprosthetic supracondylar femur fractures following total knee arthroplasty. *J Arthroplasty.* 2004;19:453–8.
  45. Herrera DA, Kregor PJ, Cole PA, et al. Treatment of acute distal femur fractures above a total knee arthroplasty: systematic review of 415 cases (1981-2006). *Acta Orthop.* 2008;79:22–7.
  46. Bong MR, Egol KA, Koval KJ, et al. Comparison of the LISS and a retrograde-inserted supracondylar intramedullary nail for fixation of a periprosthetic distal femur fracture proximal to a total knee arthroplasty. *J Arthroplasty.* 2002;17:876–81.
  47. Kilicoglu OI, Akgül T, Sağlam Y, et al. Comparison of locked plating and intramedullary nailing for periprosthetic supracondylar femur fractures after knee arthroplasty. *Acta Orthop Belg.* 2013;79:417–21
  48. Althausen PL, Lee MA, Finkemeier CG, et al. Operative stabilization of supracondylar femur fractures above total knee arthroplasty: a comparison of four treatment methods. *J Arthroplasty.* 2003;18:834–9.
  49. Ristevski B, Nauth A, Williams D, et al. Systematic review of the treatment of periprosthetic distal femur fractures. *J Orthop Trauma*;1.
  50. Beris AE, Lykissas MG, Sioros V, et al. Femoral periprosthetic fracture in osteoporotic bone after a total knee replacement: treatment with Ilizarov external fixation. *J Arthroplasty.* 2010;25:1168.e9–e12.
  51. Simon RG, Brinker MR. Use of Ilizarov external fixation for a periprosthetic supracondylar femur fracture. *J Arthroplasty.* 1999;14:118–21.
  52. Akkurt MO, Demirkale İ. Computer assisted fixation of periprosthetic supracondylar femur fracture: case report and literature review. *Int J Case Rep Short Rev.* 2017;3(3): 53-56.
  53. Keeney JA. Periprosthetic total knee arthroplasty fractures: revision arthroplasty technique. *J Knee Surg.* 2013;26:19–26.
  54. Saïdi K, Ben-Lulu O, Tsuji M, et al. Supracondylar periprosthetic fractures of the knee in the elderly patients: a comparison of treatment using Allograft-Implant Composites, Standard Revision Components, Distal Femoral Replacement Prosthesis. *J Arthroplasty.* 2014;29:110–4.
  55. Berend KR, Lombardi AV. Distal femoral replacement in nontumor cases with severe bone loss and instability. *Clin Orthop Relat Res.* 2009;467:485–92.
  56. Chen AF, Choi LE, Coleman MW, et al. Primary versus secondary distal femoral arthroplasty for treatment of total knee arthroplasty periprosthetic femur fractures. *J Arthroplasty.* 2013;28:1580–4.
  57. Appleton P, Moran M, Houshian S, et al. Distal femoral fractures treated by hinged total knee replacement in elderly patients. *J Bone Joint Surg (Br).* 2006;8:1065–70.
  58. Springer BD, Hanssen AD, Sim FH, et al. The kinematic rotating hinge prosthesis for complex knee arthroplasty. *Clin Orthop Relat Res.* 2001;392:283–91.
  59. Springer BD, Sim FH, Hanssen AD, et al. The modular segmental kinematic rotating hinge for non-neoplastic limb salvage. *Clin Orthop Relat Res.* 2004;421:181–7.
  60. Jassim SS, McNamara I, Hopgood P. Distal femoral replacement in periprosthetic fracture around total knee arthroplasty. *Injury.* 2013.
  61. Mortazavi SMJ, Kurd MF, Bender B, et al. Distal femoral arthroplasty for the treatment of periprosthetic fractures after total knee arthroplasty. *J Arthroplasty.* 2010;25:775–80.
  62. Bhattacharyya T, Chang D, Meigs JA, et al. Mortality after periprosthetic fracture of the femur. *J Bone Joint Surg Am.* 2007;89:2658–62.
  63. Figgie MP, Goldberg VM, Figgie HE, et al. The results of treatment of supracondylar fracture

- above total knee arthroplasty. *J Arthroplasty*. 1990;5:267-76.
64. Christodoulou A, Terzidis I, Ploumis A, et al. Supracondylar femoral fractures in elderly patients treated with the dynamic condylar screw and the retrograde intramedullary nail: a comparative study of the two methods. *Arch Orthop Trauma Surg*. 2005;125:73-9.
  65. Boyd AD, Wilber JH. Patterns and complications of femur fractures below the hip in patients over 65 years of age. *J Orthop Trauma*. 1992;6:167-74.
  66. Dunlop DG, Brenkel IJ. The supracondylar intramedullary nail in elderly patients with distal femoral fractures. *Injury*. 1999;30:475-84.
  67. Streubel PN, Ricci WM, Wong A, et al. Mortality after distal femur fractures in elderly patients. *Clin Orthop Relat Res*. 2011;469:1188-96.
  68. Bolhofner BR, Carmen B, Clifford P. The results of open reduction and internal fixation of distal femur fractures using a biologic (indirect) reduction technique. *J Orthop Traum*. 1996;10:372-7.