

# 19.

## Bölüm

# ÇOCUKLUK ÇAĞI BÖBREK NAKİLLERİ

Mesut DEMİR<sup>1</sup>

## GİRİŞ

Güncel tıbbi tedavinin uygulandığı tüm kurumlarda son dönem böbrek yetmezliği (SDBY) kliniği ile başvuran çocuklarda önerilen tedavi seçeneği renal transplantasyondur (böbrek nakli). 1954 yılında monozigot ikizler arasında yapılan (Herrick kardeşler) ilk böbrek naklinden sonra, böbrek nakli yetişkinler arasında kabul edilir ve geçerli bir tedavi metodu olmuştur (1). Ancak bu tedavi metodu yüksek greft kaybı nedeni ile böbrek yetmezlikli çocuklar için geçerli değildir. 20. Yüzyıl başlarından itibaren cerrahi tekniklerin gelişmesi, böbrek nakli için uygun donörlerin seçilmesi, nakil öncesi hazırlığın daha detaylı ve dikkatli yapılması, immünojik gelişmeler, daha potent immunsupresiflerin (İS) kullanılması ile böbrek transplantasyonu çocuklarda da kabul edilebilir hale gelmiştir (2).

İlk pediatrik böbrek nakli 1960 yılında Minneapolis'te yapılmıştır (3). Bu yıllarda yapılan pediatrik böbrek nakilleri, karşılaşılan çeşitli cerrahi ve immunolojik problemler nedeni ile hasta ve greft sağkalımı yönünden düşük oranlara sahipti (4). Son 20-30 yıl içerisinde söz konusu problemler aşılmış olsa da çocukların küçük boyutları, fizyolojik farklılıkları ve özellikle de uygun greft bulmaktaki zorluk nedeniyle çocukluk çağı böbrek nakli hala sorun olmaya devam etmektedir (5).

Çocuk yaş grubunda böbrek naklinin alternatifi hem yetişkin hem de çocuklarda hemodiyaliz ve periton diyalizidir. Her iki diyaliz metodu çocuk yaş grubundaki hasta bireyleri sosyal olarak günlük hayattan ve eğitim imkanlarından yoksun kalmasına neden olmaktadır. Bu durum aile ve çocuk açısından bakıldığında ciddi toplumsal problemlere neden olmaktadır. Ayrıca böbrek nakli ya-

<sup>1</sup> Uzman Doktor, SBÜ Şişli Hamidiye Etfal Eğitim ve Araştırma Hastanesi Çocuk Cerrahisi ve Organ Nakli Kliniği dr.mesut.demir@gmail.com

## KAYNAKLAR

1. Vergheze PS. Pediatric kidney transplantation: a historical review. *Pediatr Res.* 2017;81(1-2):259-264.
2. Miller LC, Bock GH, Lum CT, et al. Transplantation of adult kidney into the very small child: long-term outcome. *J Pediatr.* 1982;100(5):675-680.
3. Jalanko H, Mattila I, Holmberg C. Renal transplantation in infants. *Pediatr Nephrol.* 2016;31:725-735.
4. Mendley SR, Zelko FA. Improvement in specific aspects of neurocognitive performance in children after renal transplantation. *Kidney Int.* 1999; 56: 318-323.
5. Magee JC, Bucuvalas JC, Farmer DG, et al. Pediatric transplantation. *Am J Transplant.* 2004;4(Suppl 9):54-71.
6. Wolfe RA, Asby VB, Milford EL, et al. Comparison of mortality in all patients on dialysis, patients on dialysis awaiting transplantation, and recipients of a first cadaveric transplant. *N Engl J Med.* 1999; 341:1725-1730.
7. Winterberg P, Warshaw B. Renal Transplantation in Children. In: Morris PJ, Knechtle SJ, editor. *Kidney Transplantation- Principles and Practice.* 7<sup>th</sup>. Amsterdam: Elsevier Inc; 2014. 606-642.
8. Tsai EW, Ettenger RB. Kidney Transplantation in Children. In: Danovitch GM, editor. *Handbook of Kidney Transplantation.* Philadelphia: Lippincott Williams & Wilkins; 2010. 355-388.
9. Registo da DRC5 em TSFR 2016 da Sociedade de Nefrologia da Sociedade Portuguesa de Pediatria [article in Portuguese], [https:// www.spp.pt/UserFiles/file/Seccao\\_Nefrologia/registo\\_2010.pdf](https://www.spp.pt/UserFiles/file/Seccao_Nefrologia/registo_2010.pdf); 2017. accessed 02.10.18.
10. North American Pediatric Renal Trials and Collaborative Studies- NAPRTCS Annual Report, 2014. <https://web.emmes.com/study/ped/annlrept/annualrept2014.pdf>
11. Hebert SA, Swinford RD, Hall DR, et al. Special Considerations in Pediatric Kidney Transplantation. *Adv Chronic Kidney Dis.* 2017 Nov;24(6):398-404. doi: 10.1053/j.ackd.2017.09.009.
12. Davis ID, Bunchman TE, Grimm PC, et al. Pediatric renal transplantation: indications and special considerations. A position paper from the Pediatric Committee of the American Society of Transplant Physicians. *Pediatr Transplant.* 1998;2(2):117-129.
13. Aikawa A1, Arai K, Kawamura T, Sugiyama K et al. First living related kidney transplantation results in excellent outcomes for small children. *Transplant Proc.* 2005; 37(7): 2947-2950.
14. Carolina C, Luís R, Carmen C, et al. Pediatric Kidney Transplantation: Experience of a Center Over 4 Decades. *Transplant Proc.* 2019 Jun;51(5):1579-1584. doi: 10.1016/j.transproceed.2019.05.007.
15. Shapiro R, Sarwal MM. Pediatric kidney transplantation. *Pediatr Clin North Am* 2010;57: 393-400.
16. The 2014 Annual Report of the North American Renal Transplant Cooperative Study. Available from: <https://www.web.emmes.com/study/ped/annlrept/annualrept2014.pdf>. [Last accessed on 2017 Mar 25].
17. Hennawy HM, Hashemy A, Harbi N, et al. A single-center 4-year experience with 47 pediatricrenal transplants:Evolving trends. *Saudi J Kidney Dis Transpl.* 2018 Nov-Dec;29(6):1303-1310.
18. Van Arendonk KJ, Chow EK, James NT, et al. Choosing the order of deceased donor and living donor kidney transplantation in pediatric recipients: a Markov decision process model. *Transplantation* 2015;99(2):360-6.
19. Pamela DW, Rouba G. Long Term Outcomes of Kidney Transplantation in Children. *Pediatr Clin N Am* 66 (2019) 269-280.
20. Organ Procurement and Transplantation Network (OPTN) and Scientific Registry of Transplant Recipients (SRTR). OPTN/SRTR 2015 Annual Data Report. 2016.
21. Opelz G, Dohler B, Middleton D, et al. HLA matching in pediatric kidney transplantation: HLA poorly matched living donor transplants versus HLA well matched deceased donor transplants. *Transplantation.* 2017;101(11):2789-2792.
22. Sarwal MM, Rianthavorn P, Ettenger RB. Kidney transplantation in children. In: Knechtle SJ

- and Morris P, editors. *Kidney Transplantation-Principles and Practice*. 6<sup>th</sup>. Philadelphia: Saunders Inc. 2008. 599-629.
23. Sharma A, Ramanathan R, Posner M, Fisher RA. Pediatric kidney transplantation: a review. *Transplant Research and Risk Management*. 2013; 5: 21-31.
  24. Moudgil A, Jordan SC. Renal transplantation. In: Kher K, Schnaper HW, Greenbaum LA, editors. *Clinical Pediatric Nephrology*. 3<sup>rd</sup>. Florida: CRC Press. 2017. 743-773.
  25. Dursun I. Böbrek Nakli. In: Düşünel R, Baştuğ F. editors. *Çocuk Nefroloji El Kitabı*. Kayseri, Çocuk Nefrolojisi Derneği Yayını. 2018 .279-293.
  26. Kroger AT, Duchin J, Vazquez M. General Best Practice Guidelines for Immunization. Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP). 2017. Available at: <https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html>. Accessed August 20, 2017.
  27. Parekh RS, Carroll CE, Wolfe RA, et al. Cardiovascular mortality in children and young adults with end-stage kidney disease. *J Pediatr* 2002;141(2):191-7.
  28. Ghane Sharbaf F, Bitzan M, Szymanski KM, et al. Native nephrectomy prior to pediatric kidney transplantation: biological and clinical aspects. *Pediatr Nephrol*. 2012;27(7):1179-1188.
  29. Gargah T, Abidi K, Rajhi H, et al. Vascular complications after pediatric kidney transplantation. *Tunis Med* 2011;89:458-61.
  30. Pérez S, Barrero R, Fijo J, et al. Outcomes of pediatric living donor kidney transplantation: A single-center experience. *Pediatr Transplant*. 2017 May;21(3).
  31. Blake P, Brad K. Urologic Evaluation and Management of Pediatric Kidney Transplant Patients. *Urol Clin N Am* 45 (2018) 561-569.
  32. Pereira PL, Urrutia MJ, Labota R, Jaureguizar E. Renal transplantation in augmented bladders. *Curr Urol Rep*. 2014;15(8): 431-438.
  33. Bilginer Y, Aki F, Topaloglu R, et al. Renal transplantation in children with lower urinary tract dysfunction of different origin: a single-center experience. *Transplant Proc* 2008;40(1):85-6.
  34. Hatch DA, Koyle MA, Baskin LS, et al. Kidney transplantation in children with urinary diversion or bladder augmentation. *J Urol* 2001;165:2265-8.
  35. Dinckan A, Turkyilmaz S, Tekin A, et al. Simultaneous augmentation ileocystoplasty in renal transplantation. *Urology*. 2007; 70(6): 1211-1214.
  36. Fraser N, Lyon PC, Williams AR, et al. Native nephrectomy in pediatric transplantation less is more. *J Pediatr Urol* 2012;9:84-91.
  37. Fuller TF, Brennan TV, Feng S, et al. End stage polycystic kidney disease: indications and timing of native nephrectomy relative to kidney transplantation. *J Urol* 2005;174(6):2284-8.
  38. Chapman JR. The KDIGO clinical practice guidelines for the care of kidney transplant recipients. *Transplantation*. 2010;89(6):644-645.
  39. Grenda R, Webb NJA. Steroid minimization in pediatric renal transplantation: Early withdrawal or avoidance? *Pediatr Transplantation*. 2010; 14: 961-967.
  40. McDonald R, Niaudet P, Kim MS. (2019). Immunosuppression in renal transplantation in children. Retrieved May 13,2019, from <http://www.uptodate.com/contents/immunosuppression-in-renal-transplantation-in-children>
  41. Mincham CM, Wong G, Teixeira A, et al. Induction therapy, rejection, and graft outcomes in pediatric and adolescent kidney transplant recipients. *Transplantation*. 2017;101(9):2146-2151.
  42. Hellems R, Bosmans JL, Abramowicz D. Induction therapy for kidney transplant recipients: do we still need anti-IL2 receptor monoclonal antibodies? *Am J Transplant*. 2017;17(1):22-27.
  43. Peruzzi L, Amore A, Coppo R. Challenges in pediatric renal transplantation. *World J Transplant*. 2014;4(4):222-228.
  44. Nehus EJ, Liu C, Lu B, et al. Graft survival of pediatric kidney transplant recipients selected for de novo steroid avoidance a propensity score-matched study. *Nephrol Dial Transplant*. 2017;32(8):1424-1431.
  45. Hart A, Smith JM, Skeans MA, et al. OPTN/SRTR 2015 annual data report: kidney. *Am J*

- Transplant 2017;17(Suppl 1):21-116.
46. Fogeda M, Munoz P, Luque A, et al, BKV Study Group. Cross-sectional study of BK virus infection in pediatric kidney transplant recipients. *Pediatr Transplant* 2007;11:394-401.
  47. Smith JM, Dharnidharka VR. Viral surveillance and subclinical viral infection in pediatric kidney transplantation. *Pediatr Nephrol* 2015;30(5):741-8.
  48. Weigel F, Lemke A, Tonshoff B, et al. Febrile urinary tract infection after pediatric kidney transplantation: a multicenter, prospective observational study. *Pediatr Nephrol* 2016;31(6):1021-8.
  49. Rao PS, Ojo A. (2009). The alphabet soup of kidney transplantation:SCD, DCD, ECD-Fundamentals for the practicing nephrologist. *Clin J Am Soc Nephrol*, 4, 1827-1831.
  50. Harmon WE, Alexander SR, Tejani A, et al. The effect of donor age on graft survival in pediatric cadaver renal transplant recipients a report of the North American Pediatric Renal Transplant Cooperative Study. *Transplantation*. 1992;54(2):232-237.
  51. Englesbe MJ, Lynch RJ, Heidt DG, et al. Early urologic complications after pediatric renal transplant: a single-center experience. *Transplantation* 2008; 86:1560-4.
  52. Khositseth S, Askiti V, Nevins TE, et al. Increased urologic complications in children after kidney transplants for obstructive and reflux uropathy. *Am J Transplant* 2007;7:2152-7.
  53. Neri F, Tsivian M, Coccolini F, et al. Urological complications after kidney transplantation: experience of more than 1,000 transplantations. *Transplant Proc* 2009;41(4):1224-6.
  54. Duty BD, Barry JM. Diagnosis and management of ureteral complications following renal transplantation. *Asian J Urol* 2015;2:202-7.
  55. McDonaldR. Outcomes of renal transplantation in children. UpToDate 2018. <https://www.uptodate.com/contents/outcomes-of-renal-transplantation-in-children>. accessed.
  56. Franke D, Thomas L, Steffens R, et al. Patterns of growth after kidney transplantation among children with ESRD. *Clin J Am Soc Nephrol* 2015;10(1):127-34.
  57. Harnabat J, Cochat P. Growth after renal transplantation. *Pediatr Nephrol*. 2009;24(7):1297-1306.
  58. Shroff R, Knott C, Gullett A, et al. Vitamin D deficiency is associated with short stature and may influence blood pressure control in paediatric renal transplant recipients. *Pediatr Nephrol* 2011;26(12):2227-33.
  59. Wu Y, Cheng W, Yang XD, et al. (2013). Growth hormone improves growth in pediatric renal transplant recipients-a systemic review and metaanalysis of randomized controlled trials. *Pediatr Nephrol*, 28(1), 129-133.
  60. Terrace JD, Oniscu GC. Pediatric obesity and renal transplantation: current challenges and solutions. *Pediatr Nephrol* 2016;31(4):555-62.
  61. Prokai A, Fekete A, Kis E, et al. Posttransplant diabetes mellitus in children following renal transplantation. *Pediatr Transplant* 2008;12(6):643-9.
  62. Dharnidharka VR, Araya CE. Posttransplant lymphoproliferative disease. *Pediatr Nephrol*. 2009;24(4):731-736.
  63. Green M, Michaels MG. (2013). Epstein-Barr virus infection and posttransplant lymphoproliferative disorder. *Am J Transplant*, 13, 41-54.
  64. Paramesh A, Cannon R, Buell JF. Malignancies in pediatric solid organ transplant recipients: epidemiology, risk factors, and prophylactic approaches. *Curr Opin Organ Transplant*. 2010;15(5):621-627.