

13.

Bölüm

BÖBREK NAKLİ SONRASI CERRAHİ KOMPLİKASYONLARDA TANISAL VE GİRİŞİMSEL RADYOLOJİNİN YERİ

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GİRİŞ

Böbrek nakli son dönem böbrek yetmezliği olan hastalarda diyalizden daha uzun süreli sağkalım sağlar ve bu hasta grubunda en iyi tedavi yöntemidir, 2015 yılında Amerika Birleşik Devletleri'nde yaklaşık 15.000 böbrek nakli gerçekleştirildi (1-3). Cerrahi teknik, perioperatif tedavi ve immünsüpresif rejimlerdeki gelişmeler, sonuçların iyi olmasında ve hastaların sağ kalımında ciddi katkı sağladı. Bu gelişmelere rağmen, cerrahi komplikasyonlar yaklaşık %12-20 oranlarında görülmeye devam etmektedir (4,5). Cerrahi komplikasyonlar vasküler ve vasküler olmayan komplikasyonlar olarak ele alınır. Yapılan son çalışmalarda, böbrek nakli olan hastaların % 1-5'inde vasküler komplikasyonlar görüldüğü ve önemli morbiditeye neden olabildiği rapor edilmiş (6). Vasküler komplikasyonlar; renal greft arteriyel veya venöz trombozu, transplante renal arter kinkleşmesi/ torsiyonu, transplante renal arter stenozu (TRAS) ve arteriyel yaralanmalar (arteriyovenöz fistüller , intrarenal psödoanevrizmalar, arteriyel diseksiyon ve arteriyokalisyel fistüller) dir (4,7). Vasküler olmayan komplikasyonlar ise üreter darlığı/tıkanıklığı, idrar kaçağı, hematom, ürinom, apse veya lenfosel gibi perigreft sıvı koleksiyonları ve greft rejeksiyonudur (4,7).

Bu postoperatif komplikasyonların saptanması büyük ölçüde tanısal ve girişimsel radyolojik görüntülemeye dayanmaktadır. Greft disfonksiyonunun vasküler nedenlerinin birçoğu girişimsel radyolojik yöntemler ile etkili bir şekilde teşhis ve tedavi edilebilir. En sık kullanılan noninvasif görüntüleme yöntemleri ultrason (US), manyetik rezonans (MR) ve radyonüklid böbrek taramadır (8-11).

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KAYNAKLAR

- 1- Abecassis M, Bartlett ST, Collins AJ. Kidney transplantation as primary therapy for end-stage renal disease: National Kidney Foundation/Kidney Disease Outcomes Quality Initiative (NKF/KDOQITM) conference. *Clin J Am Soc Nephrol*. 2008;3(2):471- 480.
- 2- Wolfe RA, 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* 341:1725-1730,1999
- 3- Sharing UNfO Transplants by Organ Type—2015, January18,16– _January 16,2016.Available from: https://www.unos.org/data/trans-plant-trends/-transplants_by_organ_type+year+2015.
- 4- Orons PD, Zajko AB: Angiography and interventional aspects of renal transplantation. *Radiol Clin North Am* 33:461-471, 1995
- 5- Inci MF, Ozkan F, See TC. (2014). Renal transplant complications: diagnostic and therapeutic role of radiology. *Can Assoc Radiol J* 65(3):242–252. <https://doi.org/10.1016/j.carj.2013.06.002>
- 6- Humar A, Key N, Ramcharan T. Kidney retransplants after initial graft loss to vascular thrombosis. *Clin Transplant*. 2001;15(1):6-10.
- 7- Kobayashi K, Censullo ML, Rossman LL. Interventional radiologic management of renal transplant dysfunction: Indications, limitations, and technical considerations. *Radiographics* 27:1109-1130, 2007
- 8- Pappas P, Zavos G, Kaza P. Angioplasty and stenting of arterial stenosis affecting renal transplant function. *Transplant Proc* 2008;40:1391-6.
- 9- Libicher M, Radeleff B, Grenechar L. Interventional therapy of vascular complications following renal transplantation. *Clin Transplant* 2006;20:55-9.
- 10- Hedegard W, Saad WE, Davies MG . Management of vascular and nonvascular complications after renal transplantation. *Tech Vasc Interv Radiol* 2009;12:240-62.
- 11- Aktas S, Boyvat F, Sevmis S. Analysis of vascular complications after renal transplantation. *Transplant Proc* 2001;43:557-61.
- 12- Liu X, Berg N, Sheehan J. Renal transplant: nonenhanced renal MR angiography with magnetization-prepared steady-state free precession. *Radiology* 2009;251:535-42.
- 13- Corwin,MT,G.Fananapazir,andA.J.Chaudhari. MRangiography of renal transplant vasculature with ferumoxytol: Comparisonof high-resolution steady-stateand first-pass acquisitions.*Acad Radiol*, 23:368–373, 2016.
- 14- Hope MD, et al: Vascular imaging with ferumoxytol as a contrast agent. *AJR Am J Roentgenol* 205:W366-W373, 2015
- 15- Johnson DB, Lerner CA, Prince MR, et al. Gadoliniumenhanced magnetic resonance angiography of renal transplants. *Magn Reson Imaging* 1997;15:13-20.
- 16- Kolli KP, LaBerge JM. Interventional Management of Vascular Renal Transplant Complications. *Tech Vasc Interv Radiol*. 2016 Sep;19(3):228-36. doi: 10.1053/j.tvir.2016.06.008. Epub 2016 Jun 3.
- 17- Hamed MO, et al: Early graft loss after kidney transplantation: Risk factors and consequences. *Am J Transplant* 15:1632-1643, 2015
- 18- Keller AK,JorgensenTM,JespersenB: Identification of risk factors for vascular thrombosis may reduce early renal graft loss: a review of recent literature.*J Transplant* 2012:793461,2012
- 19- Klepanec A, et al: Pharmacomechanical thrombectomy for treatment of acute transplant renal artery thrombosis. *Ann Vasc Surg* 28:1314, 2014 [e11-4]
- 20- Melamed ML, et al: Combined percutaneous mechanical and chemical thrombectomy for renal vein thrombosis in kidney transplant recipients. *Am J Transplant* 5:621-626, 2005
- 21- Rathod J, et al: Restoration of renal function after prolonged allograft artery occlusion by thrombolysis. *Nephrol Dial Transplant* 15: 287-288, 2000
- 22- Bruno S, Remuzzi G, Ruggenti P. Transplant renal artery stenosis. *J Am Soc Nephrol*. 2004;15(1):134-141.
- 23- Buturovic-Ponikvar J. Renal transplant artery stenosis. *Nephrol Dial Transplant*. 2003;18(Suppl 5):v74-v77.

- 24- Patel NH, Jindal RM, Wilkin T: Renal arterial stenosis in renal allografts: Retrospective study of predisposing factors and outcome after percutaneous transluminal angioplasty. *Radiology* 219:663-667, 2001
- 25- Wong W, Fynn SP, Higgins RM: Transplant renal artery stenosis in 77 patients does it have an immunological course? *Transplantation* 61:215-219, 1996
- 26- Humar A, Uknis M, Papaluis V: Is there an association between cytomegalovirus and renal artery stenosis in kidney transplant recipients? *Transplantation* 69:S386, 2000
- 27- Lacombe M: Arterial stenosis complicating renal allotransplantation in man: A study of 38 cases. *Ann Surg* 181:283, 1997
- 28- Cloudon M, Lefevre F, Hestin D: Power Doppler imaging: Evaluation of vascular complications after renal transplantation. *Am J Roentgenol* 173:41-46, 1999
- 29- Gottlieb RH, Lieberman JL, Pabico RC: Diagnosis of renal artery stenosis in transplant kidneys: Value of Doppler waveform analysis of the intrarenal arteries. *Am J Roentgenol* 165:1441-1446, 1995
- 30- Benoit G, Moukarzel M, Hiesse C: Transplant renal artery stenosis: Experience and comparative results between surgery and angioplasty. *Transpl Int* 3:137-140, 1990
- 31- Gray DW: Graft renal artery stenosis in the transplanted kidney. *Transplant Rev* 8:15-21, 1994
- 32- Rengel M, Gomes-Da Silva G, Inchaustequi L: Renal artery stenosis after kidney transplantation: Diagnostic and therapeutic approach. *Kidney Int Suppl* 68:S99-106, 1998
- 33- Nicita G, Villari D, Marzocco M: Endoluminal stent placement after percutaneous transluminal angioplasty in the treatment of posttransplant renal artery stenosis. *J Urol* 159:34-37, 1998
- 34- Salvadori M, Di Maria L, Rosati A: Efficacy and safety of Palmaz stent implantation in the treatment of renal artery stenosis in renal transplantation. *Transplant Proc* 37:1047, 2005
- 35- Douis H, Shabir S, Lipkin G, et al: Drug-eluting stent insertion in the treatment of in-stent renal artery restenosis in three renal transplant recipients. *J Vasc Interv Radiol* 19:1757-1760, 2008
- 36- Ngo AT, et al: A systematic review of outcomes following percutaneous transluminal angioplasty and stenting in the treatment of transplant renal artery stenosis. *Cardiovasc Intervent Radiol* 38: 1573-1588, 2015
- 37- Willicombe M, et al: Postanastomotic transplant renal artery stenosis: Association with de novo class II donor-specific antibodies. *Am J Transplant* 14:133-143, 2014
- 38- Geddes CC, et al: Long-term outcome of transplant renal artery stenosis managed conservatively or by radiological intervention. *Clin Transplant* 22:572-578, 2008
- 39- Audard V, et al: Risk factors and long-term outcome of transplant renal artery stenosis in adult recipients after treatment by percutaneous transluminal angioplasty. *Am J Transplant* 6:95-99, 2006
- 40- Maleux G, Messiaen T, Stockx L: Trans-catheter embolization of biopsy-related vascular injuries in renal allografts: long-term technical, clinical and biochemical results. *Acta Radiol* 2003;44:13-7.
- 41- Marini M, Fernandez-Rivera C, Cao I. Treatment of transplant renal artery stenosis by percutaneous transluminal angioplasty and/or stenting: study in 63 patients in a single institution. *Transplant Proc* 2011;43:2205-7.
- 42- Saad WE, Waldman DL. Endovascular repair of vascular lesions in solid organ transplantation. In: Oriol K, Katzen BT, Rosenfield K, eds. *Complications in Endovascular Therapy*. New York: Taylor & Francis; 2006.
- 43- Akbar SA, Jafri SZ, Amendola MA. Complications of renal transplantation. *Radiographics* 2005;25:1335-56.
- 44- Golriz M, Klaus M, Zeier M. (2017) Prevention and management of lymphocele formation following kidney transplantation. *Transpl Rev (Orlando)* 31(2):100-105. <https://doi.org/10.1016/j.trre.2016.11.001>
- 45- Morgan, TA, et al: Complications of ultrasound guided renal transplant biopsies. *Am J Transplant*, 2015
- 46- Schwarz A, Mengel M, Gwinner W. (2002) Protocol biopsy program after renal transplantation:

structure and first results. *Transplant Proc* 34:2238–2239

- 47- Whittier WL, Korbet SM. (2004) Renal biopsy: update. *Curr Opin Nephrol Hypertens* 13:661–665
- 48- Patel MD, Phillips CJ, Young SW. (2010) US-guided renal transplant biopsy: efficacy of a cortical tangential approach. *Radiology* 256:290–296
- 49- Hussain F, Mallik M, Marks SD. (2010) Renal biopsies in children: current practice and audit of outcomes. *Nephrol Dial Transplant* 25:485–489
- 50- Visconti L, Cernaro V, Ricciardi CA. (2016) Renal biopsy: Still a landmark for the nephrologist. *World J Nephrol* 5:321–327
- 51- Sethi I, Brier M, Dwyer A. (2013) Predicting post renal biopsy complications. *Semin Dial* 26:633–635