

# BÖLÜM 4

## FLEP CERRAHİSİNDE MİKROCERRAHİNİN YERİ

Zikrullah BAYCAR<sup>1</sup>

### TARİHÇE

Mikrocerrahinin gelişimi için öncelikle uygun ortamın oluşması gerekmektedir. Bunlar kansız ortamın sağlanması, uzun süreli cerrahi işlem için hastanın stabil halde olması, cerrahi alan enfeksiyonun önlenmesi, yeterli büyütmenin sağlanması ve uygun mikrocerrahi ekipmanlardır.

Tıp camiasındaki yenilikler mikrocerrahi işlemler için gerekli ortamı hazırladı. 18. Yüzyılda Petit'in geliştirdiği vidalı kompresyon turnikesi sayesinde ilerde mikrocerrahi için gerekli olan kansız ortam sağlanmış oldu (2). 19. Yüzyılın başlarında Joseph Lister tarafından antisepsisin tanıtılmasıyla enfeksiyon sorunlarına yönelik adımlar atılmaya başlandı. Ardından Gustav Adolf Neuber tarafından tüm cerrahi personel için sterilizasyon kuralları uygulandı ve Charles Chamberland, 1881'de otoklav olarak bilinen buharlı sterilizatörü icat etti. 19. Yüzyılın ortalarında ağrıyi azaltmak için eter ile yapılan cerrahi işlemler ve sonrasında genel anestezinin yaygın kullanılması ile uzun süren mikrocerrahinin yapılmasına olanak sağlandı (3).

Cerrahi mikroskopun gelişimden önce cerrahlar, lensli gözlükler ve cerrahi lıuplar kullanarak mikrocerrahi operasyonlar yapıyordular. 19. Yüzyılın sonlarında Jassinowski koyun karotis damarlarını uç uca doğrudan anastomoz ederek; Murphy ise kesik damar uçlarını invagijasyon yaparak ve ince ipekle dikerek ilk başarılı vasküler anastomozları gerçekleştirdiler (4; 5). 1902'de Alexis Carrel damar cerrahisinin temel bir teknigi olan, eşit uzaklıktta atılan ve gerilimi dengeleyen 3 dikiş üçgen teknığını tattı ve 1912'de Nobel ödülüne layık görüldü (6). Teknik gelişmeler sürerken 1916'da heparinin keşfi ve 1930'larda ilk başarılı klinik deneylerin bildirilmesi ile mikrovaskü-

<sup>1</sup> Op. Dr., Konya Şehir Hastanesi Plastik, Rekonstrüktif ve Estetik Cerrahi Kliniği,  
zikrullahbaycar@gmail.com, ORCID iD: 0000-0003-4208-5201

## KAYNAKLAR

- Wei FC, Tay SK. Principle and techniques of microvascular surgery. In: Neligan PC, Gurtner GC, editors. Plastic surgery. 3rd ed. London: Elsevier; 2012. p. 587-621.
- Markatos, K., Androutsos, G., Karamanou, M. et al. Jean-Louis Petit (1674–1750): a pioneer anatomist and surgeon and his contribution to orthopaedic surgery and trauma surgery. International Orthopaedics (SICOT) 42, 2003–2007 (2018). <https://doi.org/10.10>.
- Kennedy MT (2004) A brief history of disease, science and medicine. Asklepiad Press, Mission Viejo.
- Murphy JB. Resection of arteries and veins injured in continuity end-to-end suture: Experimental and clinical research. Med Rec. 1897;51:73–88.
- Jassinowski A. Die Arteriennhat: Eine experimentelle Studie. Inaug Diss Dorpat. 1889.
- Carrel A. La technique opératoire des anastomoses vasculaires et la transplantation des viscères. Lyon Med. 1902;98:859-64.
- McLean J. The thromboplastic action of cephalin. Am J Physiol. 1916;41:250–257.
- Charles AF, Scott DA. Studies on heparin I. The preparation of heparin. J Biol Chem. 1933;102:425–429.
- Nylen CO. An oto-microscope. Acta Otolaryngol. 1923;5:414-7.
- Mavrogenis, A.F., Markatos, K., Saranteas, T. et al. The history of microsurgery. Eur J Orthop Surg Traumatol 29, 247–254 (2019). <https://doi.org/10.1007/s00590-019-02378-7>.
- Jacobson JH, Suarez EL. Microsurgery in anastomosis of small vessels. Surg Forum. 1960;11:243-5.
- Malt RA, Mckhann C. Replantation of severed arms. JAMA. 1964;189:716-22.
- Chen ZW, Yu HL. Current procedures in China on replantation of severed limbs and digits. Clin Orthop Relat Res. 1987;(215):15-23.
- Komatsu, Shigeo M.D.; Tamai, Susumu M.D.. Successful replantation of a completely cut-off thumb. Plastic and Reconstructive Surgery: October 1968 - Volume 42 - Issue 4 - p 374-377 .
- Buncke, H. J., & Schulz, W. P. (1965). Experimental digital amputation and reimplantation. Plastic and Reconstructive Surgery, 36(1), 62–70. doi:10.1097/00006534-196507000-00009 .
- Krizek TJ, Tani T, Desprez JD, Kiehn CL. Experimental transplantation of composite grafts by microsurgical vascular anastomoses. Plast Reconstr Surg. 1965;36:538-46.
- Tamai, Susumu M.D., Ph.D.. History of Microsurgery. Plastic and Reconstructive Surgery: December 2009 - Volume 124 - Issue 65 - p e282-e294 doi: 10.1097/PRS.0b013e3181bf825e.
- Tamai S, Komatsu S, Sakamoto H, Sano S, Sasauchi N. Free muscle transplants in dogs, with microsurgical neurovascular anastomoses. Plast Reconstr Surg. 1970 Sep;46(3):219-25. doi: 10.1097/00006534-197009000-00002. PMID: 4247301.
- Strauch B, Bloomberg AE, Lewin ML. An experimental approach to mandibular replacement: island vascular composite rib grafts. Br J Plast Surg. 1971;24:334-41.
- Tamai S, Sasauchi N, Hori Y, Tatsumi Y, Okuda H. Microvascular surgery in orthopaedics and traumatology. J Bone Joint Surg Br. 1972;54:637-47.
- Daniel RK, Taylor GI. Distant transfer of an island flap by microvascular anastomoses. A clinical technique. Plast Reconstr Surg. 1973 Aug;52(2):111-7. doi: 10.1097/00006534-197308000-00001. PMID: 4578998.
- McLean DH, Buncke HJ Jr. Autotransplant of omentum to a large scalp defect, with microsurgical revascularization. Plast Reconstr Surg. 1972 Mar;49(3):268-74. doi: 10.1097/00006534-197203000-00005. PMID: 4551236.
- Research Laboratory for Replantation of Severed Limb, Shanghai Sixth People's Hospital. Free muscle transplantation by microsurgical neurovascular anastomoses: Report of a case. Chin Med J (Engl.) 1976;2:47–50.

24. Harii K, Ohmori K, Torii S. Free gracilis muscle transplantation, with microneurovascular anastomoses for the treatment of facial paralysis. A preliminary report. *Plast Reconstr Surg.* 1976 Feb;57(2):133-43. doi: 10.1097/00006534-197602000-00001. PMID: 125.
25. Taylor GI, Miller GD, Ham FJ. The free vascularized bone graft. A clinical extension of microvascular techniques. *Plast Reconstr Surg.* 1975 May;55(5):533-44. doi: 10.1097/00006534-197505000-00002. PMID: 1096183.
26. Baudet J, Guimberteau JC, Nascimento E. Successful clinical transfer of two free thoraco-dorsal axillary flaps. *Plast Reconstr Surg.* 1976 Dec;58(6):680-8. doi: 10.1097/00006534-197612000-00005. PMID: 792917.
27. Millesi H. Microsurgery of peripheral nerves. *Hand.* 1973 Jun;5(2):157-60. doi: 10.1016/0072-968x(73)90061-2. PMID: 4715701.
28. Morrison WA, O'Brien BM, MacLeod AM. Thumb reconstruction with a free neurovascular wrap-around flap from the big toe. *J Hand Surg Am.* 1980 Nov;5(6):575-83. doi: 10.1016/s0363-5023(80)80110-9. PMID: 7000885.
29. Taylor GI, Palmer JH. The vascular territories (angiosomes) of the body: experimental study and clinical applications. *Br J Plast Surg.* 1987 Mar;40(2):113-41. doi: 10.1016/0007-1226(87)90185-8. PMID: 3567445.
30. Koshima I, Soeda S. Inferior epigastric artery skin flaps without rectus abdominis muscle. *Br J Plast Surg.* 1989 Nov;42(6):645-8. doi: 10.1016/0007-1226(89)90075-1. PMID: 2605399.
31. Honda T, Nomura S, Yamauchi S, Shimamura K, Yoshimura M. The possible applications of a composite skin and subcutaneous vein graft in the replantation of amputated digits. *Br J Plast Surg.* 1984 Oct;37(4):607-12. doi: 10.1016/0007-1226(84)90158-9. PMID: 63.
32. Dubernard JM, Owen E, Herzberg G, Lanzetta M, Martin X, Kapila H, Dawahra M, Hakim NS. Human hand allograft: report on first 6 months. *Lancet.* 1999 Apr 17;353(9161):1315-20. doi: 10.1016/S0140-6736(99)02062-0. PMID: 10218530.
33. Devauchelle B, Badet L, Lengelé B, Morelon E, Testelin S, Michallet M, D'Hauthuille C, Dubernard JM. First human face allograft: early report. *Lancet.* 2006 Jul 15;368(9531):203-9. doi: 10.1016/S0140-6736(06)68935-6. PMID: 16844489.
34. Masia J, Olivares L, Koshima I, Teo TC, Suominen S, Van Landuyt K, Demirtas Y, Becker C, Pons G, Garusi C, Mitsunaga N. Barcelona consensus on supermicrosurgery. *J Reconstr Microsurg.* 2014 Jan;30(1):53-8. doi: 10.1055/s-0033-1354742. Epub 2013 Sep 13. PMI.
35. Maire N, Naito K, Lequint T, Facca S, Berner S, Liverneaux P. Robot-assisted free toe pulp transfer: feasibility study. *J Reconstr Microsurg.* 2012 Sep;28(7):481-4. doi: 10.1055/s-0032-1313760. Epub 2012 May 25. PMID: 22638874.
36. Lai CS, Shen CH, Chang YT, Liu SA, Lu CT, Tsai YC, Chen IC, Feng CH, Wu CY. Recipient vessel selection for multiple free flap transfers in head and neck reconstruction at different periods. *Microsurgery.* 2021 Jul ve Ep, 41(5):438-447. doi: 10.1002/micr.30752.
37. Groth, A.K., Ono, M.C.C., D'Avanço de Moraes, A. et al. Superficial temporal vessels as a recipient site for microvascular head and neck reconstruction: is it reliable?. *Eur J Plast Surg* 43, 117–122 (2020). <https://doi.org/10.1007/s00238-019-01569-z>.
38. Nahabedian MY, Singh N, Deune EG, Silverman R, Tufaro AP. Recipient vessel analysis for microvascular reconstruction of the head and neck. *Ann Plast Surg.* 2004 Feb;52(2):148-55; discussion 156-7. doi: 10.1097/01.sap.0000095409.32437.d4. PMID: 14745264.
39. Langdell, Hannah C. M.D.; Shammas, Ronnie L. M.D.; Atia, Andrew M.D.; Chang, Edward I. M.D.; Matros, Evan M.D., M.M.Sc., M.P.H.; Phillips, Brett T. M.D., M.B.A.. Vein Grafts in Free Flap Reconstruction: Review of Indications and Institutional Pearls. *Plas.*
40. Saint-Cyr, Michel M.D, ve diğerleri.
41. Nahabedian, Maurice Y. MD, FACS. The Internal Mammary Artery and Vein as Recipient Vessels for Microvascular Breast Reconstruction: Are We Burning a Future Bridge?. *Annals of Plastic Surgery*: October 2004 - Volume 53 - Issue 4 - p 311-316.

42. Huang TC, Cheng HT. One-vein vs. two-vein anastomoses utilizing the retrograde limb of the internal mammary vein as supercharge recipient vessel in free DIEP flap breast reconstruction: A meta-analysis of comparative studies. *J Plast Reconstr Aesthet Surg.*
43. Svee, Andreas MD1,2, ve diğerleri.
44. Tan O, Atik B, Bekerecioglu M. Supercharged reverse-flow sural flap: a new modification increasing the reliability of the flap. *Microsurgery.* 2005;25:36–43.
45. Culliford AT 4th, Spector J, Blank A, Karp NS, Kasabian A, Levine JP. The fate of lower extremities with failed free flaps: a single institution's experience over 25 years. *Ann Plast Surg.* 2007 Jul;59(1):18-21; discussion 21-2. doi: 10.1097/01.sap.0000262.
46. Bali ZU, Karatan B, Tuluy Y, Kececi Y, Yoleri L. Preserving the Blood Flow of the Recipient Artery in Cross-Leg Free Flap Procedure for Lower Extremity Reconstruction. *Int J Low Extrem Wounds.* 2020 Sep;19(3):255-261. doi: 10.1177/1534734620913414. Epub 20.
47. Ince B, Ismayilzade M, Soylu A, Uyanik O, Dadaci M. Total Palmar Arch Reconstruction with Saphenous Vein Graft Following Gunshot Injury. *Indian J Plast Surg.* 2020 Dec;53(3):447-449. doi: 10.1055/s-0040-1715263. Epub 2020 Aug 10. PMID: 33402783; PMCID: PMC.
48. Nichter LS, Morgan RF, Nichter MA. The impact of Indian methods for total nasal reconstruction. *Clin Plast Surg.* 1983 Oct;10(4):635-47. PMID: 6360479.
49. Ince B, Yarar S, Dadaci M. Simultaneous flap thinning with ultrasound-assisted liposuction during free flap surgery: Preliminary results. *Microsurgery.* 2019 Feb;39(2):144-149. doi: 10.1002/micr.30377. Epub 2018 Nov 29. PMID: 30496614.
50. Taş S. Microdissected Prefabricated Flap: An Evolution in Flap Prefabrication. *Arch Plast Surg.* 2016 Nov;43(6):599-603. doi: 10.5999/aps.2016.43.6.599. Epub 2016 Nov 18. PMID: 27896196; PMCID: PMC5122554.
51. Visconti, Giuseppe MD; Salgarello, Marzia MD. Free-style Capillary Perforator-Based Island Flaps for Reconstruction of Skin Cancer Defects of the Face, Body, and Extremities. *Annals of Plastic Surgery:* August 2018 - Volume 81 - Issue 2 - p 192-197.
52. Djohan, Risal MD; Scomacao, Isis MD; Duraes, Eliana FR MD, PhD; Knackstedt, Rebecca MD, PhD; Mangan, Rachel PA-C; Schwarz, Graham MD. Sensory restoration in abdominally-based free flap for breast reconstruction using nerve allograft. *Plastic and Reconstr.*
53. Terzis JK, Skoulis TG, Soucacos PN. Vascularized nerve grafts. A review. *Int Angiol.* 1995 Sep;14(3):264-77. PMID: 8919247.
54. Donzelli R, Capone C, Sgulò FG, Mariniello G, Maiuri F. Vascularized nerve grafts: an experimental study. *Neurol Res.* 2016 Aug;38(8):669-77. doi: 10.1080/01616412.2016.1198527. Epub 2016 Jun 28. PMID: 27349271.
55. Schaverien MV, Coroneos CJ. Surgical Treatment of Lymphedema. *Plast Reconstr Surg.* 2019 Sep;144(3):738-758. doi: 10.1097/PRS.0000000000005993. PMID: 31461041.