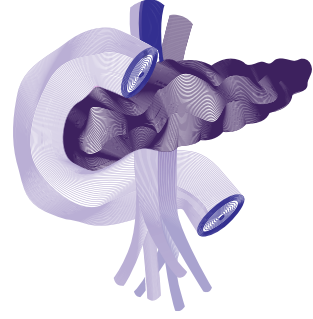


Bölüm 29

Pankreas Cerrahisi Sonrası Pankreatik Fistül Yönetimi



Mehmet Can AYDIN¹

Giriş

Pankreas cerrahisi tarihsel seyir açısından değerlendirildiğinde, geçmişten günümüze teknikten bağımsız olarak, kabul edilebilir bir morbidite ve mortalite ile artan sıklıkta uygulanmaya devam etmektedir. İleri cerrahi tecrübe ve multidisipliner yaklaşımın gerekli olduğu pankreas cerrahisi sonrası en sık karşılaşılan komplikasyonlardan biri de postoperatif pankreatik fistüldür (POPF). POPF, literatürde 3-45 % oranında olup (1-4); tedavi yaklaşımları hastanın klinik durumuna göre değişmekte ve halen cerrahların postoperatif morbidite açısından en fazla endişe uyandıran komplikasyonu olmaya devam etmektedir. Neden olabileceği batin içi abse, sepsis, organ yetmezliği ve vasküler erozyon sonrası masif intraabdominal hemoraji gibi komplikasyonlar nedeniyle (5) mortaliteye yol açabilecek olan POPF'ün yönetimi, pankreas cerrahları için oldukça önemlidir. Ek olarak POPF olan hastalarda yatış süresinin uzaması, adjuvan kemoterapiye başlamanın gecikmesi ve artan hastane maliyetleri de hızlı tanı ve uygun tedavi planlanmasının önemini gözler önüne sermektedir (6-8).

Pankreatikoduodenektomi sonrası pankreatik fistül yönetimi

İlk olarak 1935 yılında Whipple (9) tarafından uygulanan pankreatikoduodenektomi günümüzde halen periampuller tümörler için tek küratif tedavi yön-

¹ Dr. Öğr. Gör., Ondokuz Mayıs Üniversitesi, Tıp Fakültesi Genel Cerrahi Anabilim Dalı
dr.mca@hotmail.com

Diğer cerrahi işlemler sonrası pankreatik fistül yönetimi

PD ve DP dışındaki cerrahiler oldukça nadir uygulanmaktadır. Bunlar içerisinde total ve santral pankreatektomi ile enükleasyon sayılabilir. Total pankreatektomide geride pankreas dokusu kalmadığından POPF söz konusu değildir. Santral pankreatektomide, pankreasta iki adet kesik yüzey ve beraberinde iki anastomoz olduğu için hem POPF oranı (20-60 %) yüksek hem de fistüllerin evresi ileri olarak görülmektedir (71). Bu durum da işlemin yüksek morbiditesi nedeniyle olabildiğince az tercih edilmesine neden olmuştur. Enükleasyon ise genellikle benign ve uygun yerleşimli tümörlerde uygulanan bir yaklaşım olup; kaçak oranları 20-45 % düzeyindedir (72-75). Mevcut cerrahi işlemler sonrası tedavi prensipleri de daha önce bahsedilen PD ve DP ile aynıdır. Enükleasyon sonrası endoskopik pankreatik sfinkterotomi ve stent uygulamaları POPF iyileşmesi açısından umut vericidir (76).

Sonuç

Pankreas cerrahisi oldukça zor ve kompleks bir operasyon olmasının yanında; operasyon sonrası dönemde sıkça karşılaşılan ve ciddi bir komplikasyon olan postoperatif pankreatik fistülün yönetimi de hassasiyet ve tecrübe gerektirmektedir. Tanının zamanında ve doğru olarak konulması, tedavinin erken dönemde başlaması ve doğru tedavi biçiminin uygulanması hasta için hayati önem arz eder. Pankreas cerrahları tarafından güncel tedavi yöntemlerinden faydalanılırken; tartışmalı ve ileride hastaya fayda sağlama olasılığı olabilecek konularda yeni çalışmalara ihtiyaç duyulmaktadır.

KAYNAKLAR

1. Bassi C, Buchler MW, Fingerhut A, et al. Predictive factors for postoperative pancreatic fistula. *Ann Surg.* 2015;261:99.
2. Bassi C, Butturini G, Molinari E, et al. Pancreatic fistula rate after pancreatic resection. The importance of definitions. *Dig Surg.* 2004;21:54-59.
3. Zhang H, Zhu F, Shen M, et al. Systematic review and metaanalysis comparing three techniques for pancreatic remnant closure following distal pancreatectomy. *Br J Surg.* 2015;102:4-15.
4. Xiong JJ, Tan CL, Szatmary P, et al. Meta-analysis of pancreaticogastrostomy versus pancreaticojejunostomy after pancreaticoduodenectomy. *Br J Surg.* 2014;101:1196-1208.
5. Smits FJ, Henry AC, van Eijck CH, et al; Dutch Pancreatic Cancer Group. Care after pancreatic resection according to an algorithm for early detection and minimally invasive management of pancreatic fistula versus current practice (PORSCH-trial):

- design and rationale of a nationwide stepped-wedge cluster-randomized trial. *Trials*. 2020;21:389.
6. Williamsson C, Ansari D, Andersson R, et al. Postoperative pancreatic fistula-impact on outcome, hospital cost and effects of centralization. *HPB*. 2017;19:436-442.
 7. Mackay TM, Smits FJ, Roos D, et al; Dutch Pancreatic Cancer Group. The risk of not receiving adjuvant chemotherapy after resection of pancreatic ductal adenocarcinoma: a nationwide analysis. *HPB (Oxford)*. 2020;22:233-240.
 8. Conroy T, Hammel P, Hebbar M, et al; Canadian Cancer Trials Group and the Unicancer-GI-PRODIGE Group. FOLFIRINOX or Gemcitabine as Adjuvant Therapy for Pancreatic Cancer. *N Engl J Med*. 2018;379:2395-2406.
 9. Allen W, William BP, Clinton RM: Treatment of carcinoma of the ampulla of vater. *Ann Surg*. 1935;102:763-779.
 10. Machado MC, Machado MA. Systematic use of isolated pancreatic anastomosis after pancreatoduodenectomy: Five years of experience with zero mortality. *Eur J Surg Oncol*. 2016;42:1584-1590.
 11. Mishra PK, Saluja SS, Gupta M, et al. Blumgart's technique of pancreaticojejunostomy: an appraisal. *Dig Surg*. 2011;28:281-287.
 12. Harnoss JC, Ulrich AB, Harnoss JM, et al. Use and results of consensus definitions in pancreatic surgery: a systematic review. *Surgery*. 2014;155:47-57.
 13. Bassi C, Marchegiani G, Dervenis C, et al; International Study Group on Pancreatic Surgery (ISGPS). The 2016 update of the International Study Group (ISGPS) definition and grading of postoperative pancreatic fistula: 11 Years After. *Surgery*. 2017;161:584-591.
 14. Bassi C, Dervenis C, Butturini G, et al. Postoperative pancreatic fistula: an international study group (ISGPF) definition. *Surgery*. 2005;138:8-13.
 15. Williamsson C, Stenvall K, Wennerblom J, et al. Predictive Factors for Postoperative Pancreatic Fistula-A Swedish Nationwide Register-Based Study. *World J Surg*. 2020;44:4207-4213.
 16. Fang CH, Chen QS, Yang J, et al. Body mass index and stump morphology predict an increased incidence of pancreatic fistula after pancreaticoduodenectomy. *World J Surg*. 2016;40:1467-1476.
 17. Topal B, Fieuws S, Aerts R, et al. Pancreaticojejunostomy versus pancreaticogastrostomy reconstruction after pancreaticoduodenectomy for pancreatic or periampullary tumours: a multicentre randomised trial. *Lancet Oncol*. 2013;14:655-662.
 18. Figueras J, Sabater L, Planellas P, et al. Randomized clinical trial of pancreaticogastrostomy versus pancreaticojejunostomy on the rate and severity of pancreatic fistula after pancreaticoduodenectomy. *Br J Surg*. 2013;100:1597-1605.
 19. Keck T, Wellner UF, Bahra M, et al. Pancreatogastrostomy versus pancreatojejunostomy for RECONstruction after PANCreatoduodenectomy (RECOPANC, DRKS 0000767): perioperative and long-term results of a multicenter randomized controlled trial. *Ann Surg*. 2016;263:440-449.
 20. Yeo CJ, Cameron JL, Maher MM, et al. A prospective randomized trial of pancreaticogastrostomy versus pancreaticojejunostomy after pancreaticoduodenectomy. *Ann Surg*. 1995;222:580-588.
 21. Bassi C, Falconi M, Molinari E, et al. Reconstruction by pancreaticojejunostomy versus pancreaticogastrostomy following pancreatectomy: results of a comparative study. *Ann Surg*. 2005;242:767-771.

22. El Nakeeb A, Hamdy E, Sultan AM, et al. Isolated Roux loop pancreaticojejunostomy versus pancreaticogastrostomy after pancreaticoduodenectomy: a prospective randomized study. *HPB*. 2014;16:713-722.
23. Cheng Y, Briarava M, Lai M, et al. Pancreaticojejunostomy versus pancreaticogastrostomy reconstruction for the prevention of postoperative pancreatic fistula following pancreaticoduodenectomy. *Cochrane Database Syst Rev*. 2017;9:CD012257. doi: 10.1002/14651858.CD012257.pub2.
24. Kaley G, Marquardt C, Matzke H, et al. The modified Blumgart anastomosis after pancreaticoduodenectomy: a retrospective single center cohort study. *Innov Surg Sci*. 2020;5:20200021. doi: 10.1515/iss-2020-0021.
25. Li YT, Zhang HY, Xing C, et al. Effect of Blumgart anastomosis in reducing the incidence rate of pancreatic fistula after pancreatoduodenectomy. *World J Gastroenterol*. 2019;25:2514-2523.
26. Buchler M, Friess H, Klempa I, et al. Role of octreotide in the prevention of postoperative complications following pancreatic resection. *Am J Surg*. 1992;163:125-130; discussion 130-131.
27. Ke ZX, Xiong JX, Hu J, et al. Risk Factors and Management of Postoperative Pancreatic Fistula Following Pancreaticoduodenectomy: Single-center Experience. *Curr Med Sci*. 2019;39:1009-1018.
28. Smits FJ, Molenaar IQ, Besselink MG, et al; Dutch Pancreatic Cancer Group. Early recognition of clinically relevant postoperative pancreatic fistula: a systematic review. *HPB (Oxford)*. 2020;22:1-11.
29. Gabay C, Kushner I. Acute-phase proteins and other systemic responses to inflammation. *N Engl J Med*. 1999;340:448-454.
30. Malleo G, Pulvirenti A, Marchegiani G, et al. Diagnosis and management of postoperative pancreatic fistula. *Langenbecks Arch Surg*. 2014;399:801-810.
31. Malleo G, Crippa S, Butturini G, et al. Delayed gastric emptying after pylorus-preserving pancreaticoduodenectomy: validation of International Study Group of Pancreatic Surgery classification and analysis of risk factors. *HPB*. 2010;12:610-618.
32. Raman SP, Horton KM, Cameron JL, et al. CT after pancreaticoduodenectomy: spectrum of normal findings and complications. *AJR Am J Roentgenol*. 2013;201:2-13.
33. Zink SI, Soloff EV, White RR, et al. Pancreaticoduodenectomy: frequency and outcome of post-operative imaging-guided percutaneous drainage. *Abdom Imaging*. 2009;34:767-771.
34. Klek S, Sierzega M, Turczynowski L, et al. Enteral and parenteral nutrition in the conservative treatment of pancreatic fistula: a randomized clinical trial. *Gastroenterology*. 2011;141:157-163.
35. Nakata K, Mori Y, Ikenaga N, et al. Management of postoperative pancreatic fistula after pancreatoduodenectomy: Analysis of 600 cases of pancreatoduodenectomy patients over a 10-year period at a single institution. *Surgery*. 2021;169:1446-1453.
36. Pedrazzoli S, Brazzale AR. Systematic review and meta-analysis of surgical drain management after the diagnosis of postoperative pancreatic fistula after pancreaticoduodenectomy: draining-tract targeted works better than standard management. *Langenbecks Arch Surg*. 2020;405:1219-1231.
37. Smits FJ, van Santvoort HC, Besselink MG, et al. Management of severe pancreatic fistula after pancreatoduodenectomy. *JAMA Surg*. 2017;152:540-548.

38. van Santvoort HC, Besselink MG, Bakker OJ, et al. A step-up approach or open necrosectomy for necrotizing pancreatitis. *N Engl J Med.* 2010;362:1491-1502.
39. Hackert T, Hinz U, Pausch T, et al. Postoperative pancreatic fistula: we need to redefine grades B and C. *Surgery.* 2016;159:872-877.
40. Standop J, Glowka T, Schmitz V, et al. Operative reintervention following pancreatic head resection: indications and outcome. *J Gastrointest Surg.* 2009;13:1503-1509.
41. Kent TS, Callery MP, Vollmer CM Jr. The bridge stent technique for salvage of pancreaticojejunal anastomotic dehiscence. *HPB.* 2010;12:577-582.
42. Balzano G, Pecorelli N, Piemonti L, et al. Relaparotomy for a pancreatic fistula after a pancreaticoduodenectomy: a comparison of different surgical strategies. *HPB (Oxford).* 2014;16:40-45.
43. Gangl O, Fröschl U, Hofer W, et al. Unplanned reoperation and reintervention after pancreatic resections: an analysis of risk factors. *World J Surg.* 2011;35:2306-2314.
44. Denbo JW, Orr WS, Zarzaur BL, et al. Toward defining grade C pancreatic fistula following pancreaticoduodenectomy: incidence, risk factors, management and outcome. *HPB.* 2012;14:589-593.
45. Wroński M, Cebulski W, Witkowski B, et al. Surgical management of the grade C pancreatic fistula after pancreatoduodenectomy. *HPB (Oxford).* 2019;21:1166-1174.
46. Tol JA, Busch OR, van Delden OM, et al. Shifting role of operative and nonoperative interventions in managing complications after pancreatoduodenectomy: what is the preferred intervention? *Surgery.* 2014;156:622-631.
47. Baker TA, Aaron JM, Borge M, et al. Role of interventional radiology in the management of complications after pancreaticoduodenectomy. *Am J Surg.* 2008;195:386-390.
48. Sanjay P, Kellner M, Tait IS. The role of interventional radiology in the management of surgical complications after pancreatoduodenectomy. *HPB (Oxford).* 2012;14:812-817.
49. Munoz-Bongrand N, Sauvanet A, Denys A, et al. Conservative management of pancreatic fistula after pancreaticoduodenectomy with pancreaticogastrostomy. *J Am Coll Surg.* 2004;199:198-203.
50. Connor S, Alexakis N, Garden OJ, et al. Meta-analysis of the value of somatostatin and its analogues in reducing complications associated with pancreatic surgery. *Br J Surg.* 2005;92:1059-1067.
51. Lowy AM, Lee JE, Pisters PW, et al. Prospective, randomized trial of octreotide to prevent pancreatic fistula after pancreaticoduodenectomy for malignant disease. *Ann Surg.* 1997;226:632-641.
52. You DD, Paik KY, Park IY, et al. Randomized controlled study of the effect of octreotide on pancreatic exocrine secretion and pancreatic fistula after pancreatoduodenectomy. *Asian J Surg.* 2019;42:458-463.
53. Meier R, Ockenga J, Pertkiewicz M, et al. ESPEN Guidelines on Enteral Nutrition: pancreas. *Clin Nutr.* 2006;25:275-284.
54. Jiang L, Ning D, Chen X. Prevention and treatment of pancreatic fistula after pancreatic body and tail resection: current status and future directions. *Front Med.* 2020;14:251-261.
55. Jimenez RE, Hawkins WG. Emerging strategies to prevent the development of pancreatic fistula after distal pancreatectomy. *Surgery.* 2012;152:64-70.

56. Yuksel A, Bostanci EB, Colakoglu MK, et al. Pancreatic stump closure using only stapler is associated with high postoperative fistula rate after minimal invasive surgery. *Turk J Gastroenterol.* 2018;29:191-197.
57. Ecker BL, McMillan MT, Allegrini V, et al. Risk factors and mitigation strategies for pancreatic fistula after distal pancreatectomy: Analysis of 2026 resections from the international, multi-institutional distal pancreatectomy study group. *Ann Surg.* 2019;269:143-149.
58. Kleeff J, Diener MK, Z'graggen K, et al. Distal pancreatectomy: risk factors for surgical failure in 302 consecutive cases. *Ann Surg.* 2007;245:573-582.
59. Goh BK, Tan YM, Chung YF, et al. Critical appraisal of 232 consecutive distal pancreatectomies with emphasis on risk factors, outcome, and management of the postoperative pancreatic fistula: a 21-year experience at a single institution. *Arch Surg.* 2008;10:956-965.
60. Johnston FM, Cavataio A, Strasberg SM, et al. The effect of mesh reinforcement of a stapled transection line on the rate of pancreatic occlusion failure after distal pancreatectomy: review of a single institution's experience. *HPB (Oxford).* 2009;11:25-31.
61. Chang YR, Kang JS, Jang JY, et al. Prediction of pancreatic fistula after distal pancreatectomy based on cross-sectional images. *World J Surg.* 2017;41:1610-1617.
62. Knaebel HP, Diener MK, Wente MN, et al. Systematic review and meta analysis of technique for closure of the pancreatic remnant after distal pancreatectomy. *Br J Surg.* 2005;92:539-546.
63. Rieder B, Krampulz D, Adolf J, et al. Endoscopic pancreatic sphincterotomy and stenting for preoperative prophylaxis of pancreatic fistula after distal pancreatectomy. *Gastrointest Endosc.* 2010;72:536-542.
64. Hashimoto Y, Traverso LW. After distal pancreatectomy pancreatic leakage from the stump of the pancreas may be due to drain failure or pancreatic ductal back pressure. *J Gastrointest Surg.* 2012;16:993-1003.
65. Frozanpor F, Lundell L, Segersvärd R, et al. The effect of prophylactic transpapillary pancreatic stent insertion on clinically significant leak rate following distal pancreatectomy: results of a prospective controlled clinical trial. *Ann Surg.* 2012;255:1032-1036.
66. Hackert T, Klaiber U, Hinz U, et al. Sphincter of Oddi botulinum toxin injection to prevent pancreatic fistula after distal pancreatectomy. *Surgery.* 2017;161:1444-1450.
67. Flohr TG, Schaller S, Stierstorfer K, et al. Multi-detector row CT systems and image-reconstruction techniques. *Radiology.* 2005;235:756-773.
68. Oláh A, Issekutz A, Belágyi T, et al. Randomized clinical trial of techniques for closure of the pancreatic remnant following distal pancreatectomy. *Br J Surg.* 2009;96:602-607.
69. Grobmyer SR, Hunt DL, Forsmark CE, et al. Pancreatic stent placement is associated with resolution of refractory grade C pancreatic fistula after left-sided pancreatectomy. *Am Surg.* 2009;75:654-657.
70. Hackert T, Werner J, Büchler MW. Postoperative pancreatic fistula. *Surgeon.* 2011;9:211-217.
71. Goudard Y, Gaujoux S, Dokmak S, et al. Reappraisal of central pancreatectomy a 12-year single-center experience. *JAMASurg* 2014;149:356-363.

72. Sauvanet A. Surgical complications of pancreatectomy. *J Chir.* 2008;145:103-114.
73. Zhao YP, Zhan HX, Zhang TP, et al. Surgical Management of patients with insulinomas: result of 292 cases in a single institution. *J Surg Oncol.* 2011;103:169-174.
74. Brient C, Regenet N, Sulpice L, et al. Risk factors for postoperative pancreatic fistulization subsequent to enucleation. *J Gastrointest Surg.* 2012;16:1883-1887.
75. Hackert T, Hinz U, Fritz S, et al. Enucleation in pancreatic surgery: indications, technique, and outcome compared to standard pancreatic resections. *Langenbecks Arch Surg.* 2011;396:1197-1203.
76. Maire F, Ponsot P, Debove C, et al. Endoscopic management of pancreatic fistula after enucleation of pancreatic tumors. *Surg Endosc.* 2015;29:3112-3116.