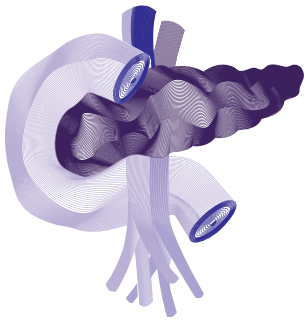
Bölüm 43

Pankreas Cerrahisinde Yapay Zekanın Yeri



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Giriş

Günümüzde teknolojik ilerlemelerde birlikte ameliyat öncesi görüntüleme ve görselleştirme yöntemlerinin artması, birçok karmaşık anatomik yapılarının daha iyi tanımlanmasına yardımcı olmaktadır. Bu gelişmiş teknolojik görüntüleme yöntemleri, artmış güvenli ve iyi anatomik çözümlemeler nedeniyle cerrahlara yol gösterici olmuştur. Buna sekonder hastalarda ameliyat sırasında ve sonrasında görülen komplikasyon oranları azaltılarak, postoperatif süreçte hastaların cerrahi sonuçlarının iyileştirilmesi hedef alınmıştır (1). Bu durum birçok anatomik varyasyonu olduğu bilinen karaciğer ve pankreas cerrahisinde ise; daha da etkin gerçekleştirildi.

Yapay zeka (YZ); mevcut klasik, laparoskopik ve robotik cerrahi uygulamalarına, üç boyutlu (3D) görselleştirme, sanal simülasyon, artırılmış gerçeklik gibi katkı saplayıcı teknikler ekleyerek cerrahi eğitime daha da yardımcı olmayı amaçlamıştır (2,3). Bununla birlikte; yapay sinir ağları ve makine öğrenimi, ameliyat öncesi görüntüleme ve ameliyat sonrası takipler sırasında standart takipten ziyade hastaya özgü bireyselleştirilmiş hasta bakımı ile mevcut tabuları yıkma potansiyeline sahiptir.

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KAYNAKLAR

1. Lee KS, Jang JY, Yu YD, et al. Usefulness of artificial intelligence for predicting recurrence following surgery for pancreatic cancer: Retrospective cohort study. Int J Surg. 2021;93:106050. doi: 10.1016/j.ijsu.2021.106050..
2. Bari H, Wadhwani S, Dasari BVM. Role of artificial intelligence in hepatobiliary and pancreatic surgery. World J Gastrointest Surg. 2021;27;13(1):7-18. doi: 10.4240/wjgs.v13.i1.7.
3. Akshintala VS, Khashab MA. Artificial intelligence in pancreaticobiliary endoscopy. J Gastroenterol Hepatol. 2021 ;36(1):25-30. doi: 10.1111/jgh.15343. PMID: 33448514.
4. Litjens G, Kooi T, Bejnordi BE, et al., A survey on deep learning in medical image analysis. Med Image Anal. 2017;42:60–88
5. Krizhevsky A, Sutskever I, E Hinton G, editors. Imagenet classification with deep convolutional neural networks. The twenty-sixth annual conference on neural information processing systems (NIPS); 2012 Dec 3-8; Nevada, United States. Advances in neural information processing systems 2012: 1097-1105.
6. Cruz JA, Wishart DS. Applications of machine learning in cancer prediction and prognosis. *Cancer Inform.* 2007;2:59–77.
7. Kang JS, Lee C, Song W, et al. Risk prediction for malignant intraductal papillary mucinous neoplasm of the pancreas: logistic regression versus machine learning. Sci Rep. 2020;18;10(1):20140. doi: 10.1038/s41598-020-76974-7.
8. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2018. *CA Cancer J Clin* 2018; 68:7–30. doi: 10.3322/caac.21442.
9. McGuigan A, Kelly P, Turkington RC, et al. Pancreatic cancer: A review of clinical diagnosis, epidemiology, treatment and outcomes. World J Gastroenterol. 2018;21;24(43):4846-4861. doi: 10.3748/wjg.v24.i43.4846.
10. Barat M, Chassagnon G, Dohan A, et al.,Artificial intelligence: a critical review of current applications in pancreatic imaging. Jpn J Radiol. 2021;39(6):514-523. doi: 10.1007/s11604-021-01098-5.
11. Kurita Y, Kuwahara T, Hara K, Diagnostic ability of artificial intelligence using deep learning analysis of cyst fluid in differentiating malignant from benign pancreatic cystic lesions. Sci Rep. 2019; 3;9(1):6893. doi: 10.1038/s41598-019-43314-3.
12. Liu SL, Li S, Guo YT, et al. Establishment and application of an artificial intelligence diagnosis system for pancreatic cancer with a faster region-based convolutional neural network. Chin Med J (Engl).2019;5;132(23):2795-2803.doi: 10.1097/CM9.0000000000000544.
13. Miyamoto R, Oshiro Y, Nakayama K, et al. Three-dimensional simulation of pancreatic surgery showing the size and location of the main pancreatic duct. Surg Today. 2017;47:357–364
14. Fang CH, Kong D, Wang X, et al.Three-dimensional reconstruction of the peripancreatic vascular system based on computed tomographic angiography images and its clinical application in the surgical management of pancreatic tumors. Pancreas. 2014;43:389–395.
15. Sauer IM, Queisner M, Tang P, et al. Mixed Reality in Visceral Surgery: Development of a Suitable Workflow and Evaluation of Intraoperative Use-cases. Ann Surg. 2017;266:706–712

16. Igami T, Nakamura Y, Oda M, et al. Application of three-dimensional print in minor hepatectomy following liver partition between anterior and posterior sectors. ANZ J Surg. 2018;88:882–885
17. Abe Y, Itano O, Kitago M, et al., Computer assisted surgery, preoperative planning and navigation for pancreatic cancer. J Hepatobiliary Pancreat Sci. 2014;21:251–255.
18. Okamoto T, Onda S, Yasuda J, et al., Navigation surgery using an augmented reality for pancreatectomy. Dig Surg. 2015;32:117–123
19. Nicolau S, Soler L, Mutter D, et al., Augmented reality in laparoscopic surgical oncology. Surg Oncol. 2011;20:189–201
20. Han IW, Cho K, Ryu Y, et al. Risk prediction platform for pancreatic fistula after pancreatoduodenectomy using artificial intelligence. World J Gastroenterol. 2020;14;26(30):4453-4464. doi: 10.3748/wjg.v26.i30.4453.
21. Yokoyama S, Hamada T, Higashi M, et al. Predicted Prognosis of Patients with Pancreatic Cancer by Machine Learning. Clin Cancer Res. 2020; 15;26(10):2411-2421. doi: 10.1158/1078-0432.CCR-19-1247
22. Garg PK, Sharma J, Jakhetiya A, et al. The Role of Prophylactic Octreotide Following Pancreaticoduodenectomy to Prevent Postoperative Pancreatic Fistula: A Meta-Analysis of the Randomized Controlled Trials. Surg J (N Y) 2018;4:e182–e187
23. Callery MP, Pratt WB, Kent TS, et al. A prospectively validated clinical risk score accurately predicts pancreatic fistula after pancreatoduodenectomy. J Am Coll Surg. 2013;216:1–1