



# Bölüm

# 9

## ROBOTİK GASTRİK CERRAHİ

*Mehmet ÖZER<sup>1</sup>*

### GİRİŞ

Laparoskopik cerrahinin gelişmesi ile birlikte robotik destekli ameliyatlarda planlanmaya başlanmıştır. Özellikle intrakorporal sütür atmanın zorluğu robotik destekli cihazlarla yenmeye çalışılmıştır. Laparoskopiyeye robotik destekli kollar ilave edilerek 1987 yılında sütür atılmaya başlanmıştır. Robotik destekli cerrahi ameliyatlarda 2000 yılında da Vinci Surgical System (DVSS)'in Amerikan FDA tarafından onaylanması ile yaygınlaşmaya başlamış, (1,2) mide kanseri olan hastaya ilk robotik distal gastrektomi ameliyatı 2002 yılında Hashizume ve arkadaşları tarafından DVSS kullanılarak yapılmıştır.(3)

Günümüzde minimal invaziv cerrahinin yaygınlaşması ile robotik mide cerrahisi, mide kanserleri, bariatrik cerrahi, hiatal herni ameliyatlarında giderek artan sayılarla yapılmaktadır.

### Mide Kanserlerinde Robotik Cerrahi

Günümüzde mide kanseri insan sağlığı için hala ciddi bir tehdittir ve kanser ölümlerinin üçüncü önde gelen nedeni ve dünyada en sık teşhis edilen beşinci kanserdir. (4)

Multidisipliner tedavideki ilerlemeye rağmen, radikal eksizyon en etkili kuratif tedavi yaklaşımı olarak kabul edilmektedir. (5)

---

<sup>1</sup> Uzm. Dr., Ankara Bilkent Şehir Hastanesi, Genel Cerrahi Kliniği, dr.mehmet.ozer@gmail.com

RG ile LG ve OG karşılaştıran randomize kontrollü çalışma bulunmamaktadır.

Fakat meta-analizler ışında hasta güvenliğini tehlikeye atmadan ve onkolojik presplerden ödün vermeden uygulanabileceğine yönelik kanıtlar vardır.

Tüm cerrahi prosedürlerdeki gibi robotik cerrahide de tecrübe ve mentor desteği önemlidir. Bu destekler ile birlikte operasyon süresi kısaltmakta ve komplikasyon oranları da azalabilmektedir. (35)

Maliyet yüksekliği robotik cerrahi için problem teşkil etse de morbidite azalması, kısalan hastanede yatış süresi ve bu iki etkene bağlı olarak azaltılabilecek hastane masrafları sayesinde bu oranın giderek azalabileceği düşünülebilir.

Ayrıca teknik gelişmeler ve daha fazla kullanılan robotik sistemler de maliyet düşüşü sağlayabilecektir.

Sonuç olarak kısa ve uzun dönem komplikasyonlar açısından diğer LG ve OG ile benzer ve hatta birçoğunda daha iyi olmakla birlikte; minimal invaziv cerrahinin avantajlarına sahip olarak RG, mide kanserli hastalarda uygulanabilecek bir tekniktir.

## KAYNAKLAR:

13. Falk V, Diegeler A, Walther T, Banusch J, Brucerius J, et al. Total endoscopic computer enhanced coronary artery bypass grafting. *Eur J Cardiothorac Surg* 2000;17:38-45.
14. Cadiere GB, Himpens J, Gernay O, Izizaw R, Deguelde M, et al. Feasibility of robotic laparoscopic surgery: 146 cases. *World J Surg* 2001;25:1467-77.
- Hashizume M, Shimada M, Tomikawa M, Ikeda Y, Takahashi I, et al. Early experiences of endoscopic procedures in general surgery assisted by a computer-enhanced surgical system. *Surg Endosc* 2002;16:1187-91.
- Josep T, Paulo MH, Lin S, Atsushi O, Manish AS, Karen C, Chunyan S, Haiyan W, Jennifer EW, Katherine K, et al. Pertuzumab plus trastuzumab and chemotherapy for HER2-positive metastatic gastric or gastroesophageal junction cancer (JACOB): final analysis of a double-blind, randomised, placebo-controlled phase 3 study. *Lancet Oncol.* 2018;19: 1372–84.
- Sano T, Sasako M, Yamamoto S, Nashimoto A, Kurita A, Hiratsuka M, Tsujinaka T, Kinoshita T, Arai K, Yamamura Y, Okajima K. Gastric cancer surgery: morbidity and mortality results from a prospective randomized controlled trial comparing D2 and extended para-aortic lymphadenectomy--Japan Clinical Oncology Group study 9501. *J Clin Oncol.* 2004;22:2767–73.
- Japanese Gastric Cancer Association. *Gastric Cancer.* 2021 Jan;24(1):1-21. doi: 10.1007/s10120-020-01042-y. Epub 2020 Feb 14. PMID: 32060757.
- Kitano S, Iso Y, Moriyama M, Sugimachi K. Laparoscopy-assisted Billroth-I gastrectomy. *Surgical Laparoscopy & Endoscopy.* 1994;4:146–8.
- Huscher CG, Mingoli A, Sgarzini G, Sansonetti A, Di Paola M, Recher A et al. Laparoscopic versus open subtotal gastrectomy for distal gastric cancer: five-year results of a randomized prospective trial. *Ann Surg* 2005; 241: 232–237.
- Cunningham D, Chua YJ. East meets west in the treatment of gastric cancer. *N Engl J Med* 2007; 357: 1863–1865.
- Lee JH, Han HS, Lee JH. A prospective randomized study comparing open vs laparos-

- copy-assisted distal gastrectomy in early gastric cancer: early results. *Surgical Endoscopy*. 2005;19:168–73.
11. Kim YW, Baik YH, Yun YH, Nam BH, Kim DH, Choi IJ, Bae JM. Improved quality of life outcomes after laparoscopy-assisted distal gastrectomy for early gastric cancer: results of a prospective randomized clinical trial. *Ann. Surg.* 2008;248:721–7.
  12. Scatizzi M, Kröning KC, Lenzi E, Moraldi L, Cantafio S, Feroci F. Laparoscopic versus open distal gastrectomy for locally advanced gastric cancer: a case–control study. *Updates in Surgery*. 2011;63:17–23.
  13. Song J, Lee HJ, Cho GS, Han SU, Kim MC, Ryu SW, Kim W, Song KY, Kim HH, Hyung WJ. Recurrence following laparoscopy-assisted gastrectomy for gastric cancer: a multicenter retrospective analysis of 1,417 patients. *Ann. Surg Oncol.* 2010;17:1777–86.
  14. Kang SY, Lee SY, Kim CY, Yang DH. Comparison of learning curves and clinical outcomes between laparoscopy-assisted distal gastrectomy and open distal gastrectomy. *Journal of Gastric Cancer*. 2010;10:247–53.
  15. Medcaroid, Inc. <https://www.medcaroid.com/en/>. Accessed 8 Nov 2018.
  16. Medtronic, Inc. <https://www.medtronic.com/us-en/index.html>. Accessed 8 Nov 2018.
  17. Verb Surgical, Inc. <https://www.verbsurgical.com/>. Accessed 8 Nov 2018.
  18. TransEnterix, Inc. <https://transenterix.com/>. Accessed 8 Nov 2018.
  19. *Br J Surg* . 2013 Nov;100(12):1566–78. doi: 10.1002/bjs.9242. Systematic review and meta-analysis of robotic surgery compared with conventional laparoscopic and open resections for gastric carcinoma
  20. M H Hyun 1, C H Lee, H J Kim, Y Tong, S S Park Affiliations expand PMID: 24264778 DOI: 10.1002/bjs.9242.
  21. Kim HI, Han SU, Yang HK, Kim YW, Lee HJ, Ryu KW, et al. Multicenter prospective comparative study of robotic versus laparoscopic gastrectomy for gastric adenocarcinoma. *Ann Surg.* 2016;263:103–9.
  22. Suda K, Man IM, Ishida Y, Kawamura Y, Satoh S, Uyama I. Potential advantages of robotic radical gastrectomy for gastric adenocarcinoma in comparison with conventional laparoscopic approach: a single institutional retrospective comparative cohort study. *Surg Endosc.* 2015;29:673–85.
  23. *Gastric Cancer*. 2019 Mar;22(2):377–385. doi: 10.1007/s10120-018-00906-8. Epub 2018 Dec 3. Clinical advantages of robotic gastrectomy for clinical stage I/II gastric cancer: a multi-institutional prospective single-arm study Ichiro Uyama 1, Koichi Suda 2, Masaya Nakauchi 2, Takahiro Kinoshita 3, Hirokazu Noshiro 4, Shuji Takiguchi 5 6, Kazuhisa Ehara 7, Kazutaka Obama 8 9, Shiro Kuwabara 10, Hiroshi Okabe 11, Masanori Terashima 12 PMID: 30506394 DOI: 10.1007/s10120-018-00906-8.
  24. Clavien PA, Barkun J, de Oliveira ML, Vauthey JN, Dindo D, Schulick RD, et al. The Clavien–Dindo classification of surgical complications: five-year experience. *Ann Surg.* 2009;250:187–96.
  25. *World J Surg Oncol* . 2019 May 23;17(1):86. doi: 10.1186/s12957-019-1628-2. Comparative analysis of robotic gastrectomy and laparoscopic gastrectomy for gastric cancer in terms of their long-term oncological outcomes: a meta-analysis of 3410 gastric cancer patients Guixiang Liao 1, Zhihong Zhao 2, Muhammad Khan 3, Yawei Yuan 4, Xianming Li 5 PMID: 31122260 DOI: 10.1186/s12957-019-1628-2.
  26. *World J Surg Oncol*. 2020; 18: 306. Published online 2020 Nov 24. doi: 10.1186/s12957-020-02080-7 PMCID: PMC7688002 PMID: 33234134 Robotic versus laparoscopic gastrectomy for gastric cancer: a systematic review and meta-analysis Jianglei Ma,<sup>#1</sup> Xiaoyao Li,<sup>#1</sup> Shifu Zhao,<sup>1</sup> Ruifu Zhang,<sup>1</sup> and Dejun Yang<sup>2</sup>
  27. Kandil EH, Noureldine SI, Yao L, Slakey DP. Robotic transaxillary thyroidectomy: an Examination of the first one hundred cases. *Journal of the American College of Surgeons*. 2012;214:558–64.

28. Hee KB, Yi X, Hoon H, Wook AC, Kwan CY, Han SU. Comparison of surgical outcomes between robotic and laparoscopic gastrectomy for gastric cancer: the learning curve of robotic surgery. *J Gastric Cancer*. 2012;12:156–63.
29. Uyama I, Kanaya S, Ishida Y, Inaba K, Suda K, Satoh S. Novel integrated robotic approach for suprapancreatic D2 nodal dissection for treating gastric cancer: technique and initial experience. *World Journal of Surgery*. 2012;36:331–7.
30. Liu GX, Shen WS, Chen L, Wei B. Robotic versus laparoscopic gastrectomy for gastric cancer: a meta-analysis. *Zhong Hua Wei Chang Wai Ke Za Zhi*. 2016;19:328–33.
31. Wang PY, Xiong BH, Zeng YJ, Tian Y, Wang KH, Luo HY, et al. Meta-analysis of da Vinci robotic versus laparoscopic gastrectomy for gastric cancer. *Chin J Gen Surg*. 2017;26:412–24.
32. Song J, Oh SJ, Kang WH, Hyung WJ, Choi SH, Noh SH. Robot-assisted gastrectomy with lymph node dissection for gastric cancer: lessons learned from an initial 100 consecutive procedures. *Ann Surg*. 2009;249(6):927–32.
33. Coratti A, Annecchiarico M, Di Marino M, Gentile E, Coratti F, Giulianotti PC. Robot-assisted gastrectomy for gastric cancer: current status and technical considerations. *World J Surg*. 2013;37(12):2771–81.
34. Coratti A, Annecchiarico M, Di Marino M, Gentile E, Coratti F, Giulianotti PC. Robot-assisted gastrectomy for gastric cancer: current status and technical considerations. *World J Surg*. 2013;37(12):2771–81.
35. *Gastric Cancer*. 2019 Mar;22(2):377-385. doi: 10.1007/s10120-018-00906-8. Epub 2018 Dec 3. Clinical advantages of robotic gastrectomy for clinical stage I/II gastric cancer: a multi-institutional prospective single-arm study Ichiro Uyama 1, Koichi Suda 2, Masaya Nakauchi 2, Takahiro Kinoshita 3, Hirokazu Noshiro 4, Shuji Takiguchi 5 6, Kazuhisa Ehara 7, Kazutaka Obama 8 9, Shiro Kuwabara 10, Hiroshi Okabe 11, Masanori Terashima 12 PMID: 30506394 DOI: 10.1007/s10120-018-00906-8.