Surg Endosc (2008) 22:1405–1406
DOI 10.1007/s00464-008-9796-0

Robotic surgery for rectal cancer: may it improve also survival?

Dimosthenis Ziogas · Dimitrios Roukos

Received: 26 November 2007 / Accepted: 1 January 2008 / Published online: 5 March 2008

Treatment and survival of patients with solid cancers have been improved over the last years. Two of the major goals and challenges for various cancers including colorectal, stomach, breast and other tumors are: local control by appropriate surgery alone or plus chemoradiotherapy [1–4] and personalized adjuvant systemic treatment through molecular and genetic biomarkers [5–8].

Laparoscopic surgery has been increasingly adopted into clinical practice, mostly to improve the quality of life (QOL) of patients with gastrointestinal cancer. However, there is no evidence that it improves also survival rates. Perhaps, low anterior rectal resection with total mesorectal excision (TME) represents a field in which the laparoscopic approach might lead to better local control, disease-free survival, and overall survival than the open procedure.

In a recent issue of the *Journal* Baik et al. report on the use of the da Vinci system in rectal cancer surgery [9]. Why should this technique, beyond QOL improvement, also provide survival benefit? Why can this benefit not be obtained for other cancer sites in the gastrointestinal tract?

Total mesorectal excision (TME) has become the standard surgical procedure for localized rectal cancer [1]. The principle underlying TME is secure dissection of an avascular plane between the presacral fascia and the fascia propria of the rectum without injuring the proper fascia of the rectum [1]. This principle can better be ensured with the laparoscopic than the open approach. The da Vinci system, beyond this, provides the surgeon with a three-dimensional surgical view that permits a steadier dissection with tremor elimination and motion scaling.

Baik et al. report on safety, feasibility, and efficiency in nine patients who underwent robotic TME using four robotic arms for the treatment of mid or low rectal cancer. The facts that this technique allows a perfect TME that might also result in sparing radiation if pathological examination reveals tumor-free proper fascia of the rectum, and perhaps most importantly local recurrence reduction and improved survival, suggests that a prospective validation of this robotic technique is warranted.

Personalization in health care maximizes the benefits for society and individual patients. At the present time, this goal appears more realistic in the prevention and treatment of the inherited cancer syndromes than of the sporadic common cancers. Indeed, prophylactic surgery in carriers of mutations in mismatch-repair genes (hereditary nonpolyposis colorectal cancer or Lynch syndrome), in *BRCA1/2* (hereditary breast ovarian cancer syndrome) and in *CDH1* (hereditary diffuse gastric cancer syndrome) seems to be more effective than close surveillance [10–17]. Given that, with the exception of early-stage cancer [18–21], cure rates of patients with colorectal, gastric, breast, and other common solid tumors are moderate or low [22–31], appropriate preventive intervention may save the lives of many individual patients.

Although longer follow-up data after laparoscopic surgery over open traditional resection demonstrates that the benefits in QOL for colorectal cancer are limited to the early postoperative course of months or a few years, robotic surgery for rectal cancer through an excellent TME may improve local control without the addition of radiation in some selected patients. A prospective evaluation to assess whether robotic surgery may improve local recurrence and survival is warranted.

D. Ziogas (✉) · D. Roukos
Department of Surgery, School of Medicine, University of Ioannina, Ioannina, Eperos, Greece
e-mail: deziogas@hotmail.com

References

1. Enker WE, Thaler HT, Cranor ML, Polyak T (1995) Total mesorectal excision in the operative treatment of carcinoma of the rectum. J Am Coll Surg 181:335–346
2. Roukos DH, Kappas AM (2005) Perspectives in the treatment of gastric cancer. Nat Clin Pract Oncol 2:98–107
3. Roukos DH (2002) Adjuvant chemoradiotherapy in gastric cancer: wave goodbye to extensive surgery? Ann Surg Oncol 9(3):220–221
4. Clarke M, Collins R, Darby S et al (2005) Early Breast Cancer Trialists Collaborative Group (EBCTCG). Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomized trials. Lancet 366(9503):2087–2106
5. Roukos DH, Murray S, Briasoulis E (2007) Molecular genetic tools shape a roadmap towards a more accurate prognostic prediction and personalized management of cancer. Cancer Biol Ther 6(3):308–312
6. Roukos DH (2008) HER2 and response to paclitaxel in node-positive breast cancer. N Engl J Med 358:197–198 (author reply 198)
7. Roukos DH (2008) Innovative genomic-based model for personalized treatment of gastric cancer: integrating current standards and new technologies. Expert Rev Mol Diagn 8(1):29–30
8. Roukos DH**,** Briasoulis E (2007) Individualized preventive and therapeutic management of hereditary breast ovarian cancer. Nat Clin Pract Oncol 4:578–590
9. Baik SH, Lee WJ, Rha KH et al (2007) Robotic total mesorectal excision for rectal cancer using four robotic arms. Surg Endosc (Epub ahead of print)
10. Roukos DH, Fatouros M, Tsianos E, Kappas AM (2006) Does a new model improve decisions about mismatch-repair genetic testing and Lynch syndrome identification? Nat Clin Pract Oncol 3(12):656–657
11. Lynch HT, de la Chapelle A (2003) Hereditary colorectal cancer. N Engl J Med 348:919–932
12. Roukos DH, Kappas AM, Tsianos E (2002) Role of surgery in the prophylaxis of hereditary cancer syndromes. Ann Surg Oncol 9(7):607–609
13. Roukos DH, Agnanti NJ, Paraskevaidis E, Kappas AM (2002) Approaching the dilemma between prophylactic bilateral mastectomy or oophorectomy for breast and ovarian cancer prevention in carriers of BRCA1 or BRCA2 mutations. Ann Surg Oncol 9(10):941–943
14. Norton JA, Ham CM, Van Dam J et al (2007) CDH1 truncating mutations in the E-cadherin gene: an indication for total gastrectomy to treat hereditary diffuse gastric cancer. Ann Surg 245(6):873–879
15. Roukos DH (2007) Prognosis of breast cancer in carriers of BRCA1 and BRCA2 mutations. N Engl J Med 357(15):1555–1556 (author reply 1556)
16. Fatouros M, Baltoyiannis G, Roukos DH (2008) The predominant role of surgery in the prevention and new trends in the surgical treatment of women with BRCA1/2 mutations. Ann Surg Oncol 15(1):21–33
17. Agnantis NJ, Paraskevaidis E, Roukos D (2004) Preventing breast, ovarian cancer in BRCA carriers: rational of prophylactic surgery and promises of surveillance. Ann Surg Oncol 11(12):1030–1034
18. Roukos DH, Kappas AM, Agnantis NJ (2003) Perspectives and risks of breast-conservation therapy for breast cancer. Ann Surg Oncol 10(7):718–721
19. Fatouros M, Roukos DH, Arampatzis I, Sotiriadis A, Paraskevaidis E, Kappas AM (2005) Factors increasing local recurrence in breast-conserving surgery. Expert Rev Anticancer Ther 5(4):737–745
20. Roukos DH, Hottenrott C, Encke A, Baltogiannis G, Casioumis D (1994) Primary gastric lymphomas: a clinicopathologic study with literature review. Surg Oncol 3(2):115–125
21. Roukos DH (2004) Early-stage gastric cancer: a highly treatable disease. Ann Surg Oncol 11(2):127–129
22. Briasoulis E, Fatouros M, Roukos DH (2007) Level I evidence in support of perioperative chemotherapy for operable gastric cancer: sufficient for wide clinical use? Ann Surg Oncol 14(10):2691–2695
23. Roukos DH, Lorenz M, Karakostas K, Paraschou P, Batsis C, Kappas AM (2001) Pathological serosa and node-based classification accurately predicts gastric cancer recurrence risk and outcome, and determines potential and limitation of a Japanese-style extensive surgery for Western patients: a prospective with quality control 10-year follow-up study. Br J Cancer 84(12):1602–1609
24. Kappas AM, Fatouros M, Roukos DH (2004) Is it time to change surgical strategy for gastric cancer in the United States? Ann Surg Oncol 11(8):727–730
25. Roukos DH, Kappas AM (2002) Targeting the optimal extent of lymph node dissection for gastric cancer. J Surg Oncol 81(2):59–62
26. Roukos DH (1998) Extended lymphadenectomy in gastric cancer: when, for whom and why. Ann R Coll Surg Engl 80(1):16–24
27. Roukos DH (2000) Extended (D2) lymph node dissection for gastric cancer: do patients benefit? Ann Surg Oncol 7(4):253–255
28. Briasoulis E, Liakakos T, Dova L et al (2006) Selecting a specific pre- or postoperative adjuvant therapy for individual patients with operable gastric cancer. Expert Rev Anticancer Ther 6(6):931–939
29. Roukos DH (1999) Current advances and changes in treatment strategy may improve survival and quality of life in patients with potentially curable gastric cancer. Ann Surg Oncol 6:46–56
30. Liakakos T, Roukos DH (2008) More controversy than ever-challenges and promises towards personalized treatment of gastric cancer. Ann Surg Oncol (Epub ahead of print). doi: 10.1245/s10434-007-9798-5
31. Roukos DH (2008) Linking contralateral breast cancer with genetics. Radiother Oncol 86:139–141