

Wait times from diagnosis to treatment in cancer

Laurie Elit

Department of Obstetrics and Gynecology, McMaster University, Hamilton, ON, Canada

See accompanying article by Nanthamongkolkul and Hanprasertpong on page 262.

Receiving a cancer diagnosis is anxiety provoking. Waiting for definitive treatment for cancer augments this anxiety [1-7]. Waiting for treatment also decreases patient satisfaction with their medical center and results in a poorer quality of life [4,8]. The underlying concern is whether longer wait times lead to spreading of tumor, the need for more extensive therapy and ultimately poorer survival.

There have been studies across cancer types addressing the relationship between wait times and overall survival. **Table 1** shows those studies where there is a clear detrimental relationship on survival and those where the relationship is inconclusive [4,8-35].

With the exception of esophageal cancer, each disease site has studies showing divergent answers as to whether there is a relationship between wait times for surgery and survival. In part this is related to the quality of the studies. All of the studies are retrospective cohort studies that may be single center or population based. Such studies have the risk of confounding and so it is important to conduct multivariate analysis with risk adjustment. Unfortunately, many studies do not have details about stage, or histology which should be included in the model. Duration of follow-up can lead to variation in results. In addition the reason for treatment delay is not always clear (i.e., patient comorbidities impacting the timing of surgery). Single center studies often have small sample sizes which may limit the ability to find a relationship even if one exists. Rather than looking at wait times as a continuous relationship, often the studies look at wait times in a dichotomous variable and so miss an issue.

There is a clear relationship between better outcomes (quality of care) in high volume hospitals compared to low volume centers across many cancer types [10]. In many jurisdictions we

have seen a displacement of surgical volume to high volume cancer centers [36]. Rising wait times in this setting reflects a compromised ability of the system of care to deal with this volume in terms of availability of resources and efficiencies [9]. Specific stresses are seen in diagnostic (i.e., diagnostic radiology, interventional radiology, pathology) and treatment resources (number of quality oncology surgeons, operating room access, inpatient beds) [4,8,9,36-38]. To compound this, fixed hospital budgets limit capacity and provide little incentive for medical staff to increase production. To deal with this problem, there has been a plea that wait times be considered when formulating national health policy [8]. Profession societies and authorities have set standards which by enlarge focus on 30 days from diagnosis of cancer to treatment [8,39] and no longer than 8 weeks [40,41]. Fast tract programs in Europe, USA, and Canada [9,11,42] promote care pathways to minimize time from diagnosis, staging to treatment. Implementing multidisciplinary tumor boards and joint clinics have also helped.

In this journal, Nanthamongkolkul and Hanprasertpong [35] adds to the list of studies in **Table 1** showing that in Thailand at a single center, wait times exceeding 8 weeks for surgery in early stage cervical cancer care leads to worse outcomes. This group also shows that in addition to system issues described above, in middle resource countries, long wait times for surgery can be related to additional factors. Rising wait times can reflect issues with inability to pay (co-pay or patient pay systems), poor access to services (i.e., limited human resources like surgical oncologists or limited treatment resources like availability of operating rooms) [8,9], and poor quality of care (i.e., timely diagnosis through screening, diagnosis and staging investigation) [8,12].

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

Correspondence to

Laurie Elit
Department of Obstetrics and Gynecology, Juravinski Cancer Centre,
McMaster University, 699 Concession Street, Hamilton, ON L8V 5C2,
Canada. E-mail: elitlor@hhsc.ca

Copyright © 2015. Asian Society of Gynecologic Oncology, Korean Society of Gynecologic Oncology

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Table 1. Relationship of time from diagnosis to surgical treatment on survival

| | Clear relationship | | Unclear relationship | |
|---------------|---|---------------------------|--|----------------|
| | Study | Time | Study | Time |
| Bladder | Kulkarni et al. (2009) [13]* | 40 day | Nielsen et al. (2007) [17] | |
| | Ayres et al. (2008) [14] | 3 mo | | |
| | Lee et al. (2006) [15] | 3 mo | | |
| | Gore et al. (2009) [16] | 12 wk | | |
| Breast | Richards et al. (1999) [18] [†] | 3 mo | Brazda et al. (2010) [12] | |
| | Yun et al. (2012) [8]* | 1 mo | McLaughlin et al. (2012) [19] (early stage) | |
| | McLaughlin et al. (2012) [19] (late stage)* | 60 day | | |
| Cervix | Nanthamongpkolkul et al. (2015) [35] | 8 wk | Umezu et al. (2012) [20] Perri et al. (2014) [21] | |
| Colorectal | Yun et al. (2012) [8]* | 1 mo | Ramos et al. (2007) [24] [†] | |
| | | | Simunovic et al. (2009) [4]* | 2 wk |
| | | | Walsh et al. (2007) [22] | 2 wk |
| | | | Zafar et al. (2012) [23] | |
| | | | Currie et al. (2012) [25] | |
| Esophagus | | | Kotz et al. (2006) [27]* | 3, 5, 9 wk |
| | | | Grotenhuis et al. (2010) [26] | |
| | | | Sharpe et al. (2010) [28] | 2 wk |
| Head and neck | Van Harten et al. (2015) [11]* | 15, 30, 60, 75, 90 day | | |
| Lung | Yun et al. (2012) [8]* | 1 mo | Myrdal et al. (2004) [29] | |
| Melanoma | Pacifico et al. (2007) [30] | 2 wk | | |
| Pancreas | Yun et al. (2012) [8] | 1 mo | Raptis et al. (2010) [31] | 62 day |
| Prostate | | | Redaniel et al. (2013) [32]* | 3, 6 mo |
| Renal | | | Stec et al. (2008) [10] | |
| Stomach | | | Yun et al. (2012) [8]* | 1 mo |
| Uterus | Elit et al. (2014) [9]* | 12 wk | Menczer et al. (1995) [33] | 4 mo |
| | | | Matsuo et al. (2015) [34] | 14, 42, 84 day |

*Population based; [†]Meta-analysis.**REFERENCES**

- Robinson KM, Christensen KB, Ottesen B, Krasnik A. Diagnostic delay, quality of life and patient satisfaction among women diagnosed with endometrial or ovarian cancer: a nationwide Danish study. *Qual Life Res* 2012;21:1519-25.
- Dietsch E, Davies C. The nocebo effect for women in waiting. *Collegian* 2007;14:9-14.
- Davies S. Diagnosis cancer: one woman's agonizing wait for surgery [Internet]. Canadian Health; [cited 2015 Jun15]. Available from: http://www.canadian-health.ca/2_5/42_e.html.
- Simunovic M, Rempel E, Theriault ME, Baxter NN, Virnig BA, Meropol NJ, et al. Influence of delays to nonemergent colon cancer surgery on operative mortality, disease-specific survival and overall survival. *Can J Surg* 2009;52:E79-86.
- Wait Times Alliance Canada. Reducing wait times and achieving benchmarks. Ottawa: Canadian Medical Association; 2006.
- Payne DK, Sullivan MD, Massie MJ. Women's psychological reactions to breast cancer. *Semin Oncol* 1996;23(1 Suppl 2):89-97.
- Rapoport Y, Kreitler S, Chaitchik S, Algor R, Weissler K. Psychosocial problems in head-and-neck cancer patients and their change with time since diagnosis. *Ann Oncol* 1993;4:69-73.
- Yun YH, Kim YA, Min YH, Park S, Won YJ, Kim DY, et al. The influence of hospital volume and surgical treatment delay on long-term survival after cancer surgery. *Ann Oncol* 2012;23:2731-7.
- Elit LM, O'Leary EM, Pond GR, Seow HY. Impact of wait times on survival for women with uterine cancer. *J Clin Oncol* 2014;32:27-33.
- Stec AA, Coons BJ, Chang SS, Cookson MS, Herrell SD, Smith JA Jr, et al. Waiting time from initial urological consultation to nephrectomy for renal cell carcinoma: does it affect survival? *J Urol* 2008;179:2152-7.
- van Harten MC, Hoebbers FJ, Kross KW, van Werkhoven ED, van den

- Brekel MW, van Dijk BA. Determinants of treatment waiting times for head and neck cancer in the Netherlands and their relation to survival. *Oral Oncol* 2015;51:272-8.
12. Brazda A, Estroff J, Euhus D, Leitch AM, Huth J, Andrews V, et al. Delays in time to treatment and survival impact in breast cancer. *Ann Surg Oncol* 2010;17 Suppl 3:291-6.
 13. Kulkarni GS, Urbach DR, Austin PC, Fleshner NE, Laupacis A. Longer wait times increase overall mortality in patients with bladder cancer. *J Urol* 2009;182:1318-24.
 14. Ayres BE, Gillatt D, McPhail S, Cottrell A, McGrath J, Cottier B, et al. A delay in radical cystectomy of >3 months is not associated with a worse clinical outcome. *BJU Int* 2008;102:1045.
 15. Lee CT, Madii R, Daignault S, Dunn RL, Zhang Y, Montie JE, et al. Cystectomy delay more than 3 months from initial bladder cancer diagnosis results in decreased disease specific and overall survival. *J Urol* 2006;175:1262-7.
 16. Gore JL, Lai J, Setodji CM, Litwin MS, Saigal CS; Urologic Diseases in America Project. Mortality increases when radical cystectomy is delayed more than 12 weeks: results from a Surveillance, Epidemiology, and End Results-Medicare analysis. *Cancer* 2009;115:988-96.
 17. Nielsen ME, Palapattu GS, Karakiewicz PI, Lotan Y, Bastian PJ, Lerner SP, et al. A delay in radical cystectomy of >3 months is not associated with a worse clinical outcome. *BJU Int* 2007;100:1015-20.
 18. Richards MA, Westcombe AM, Love SB, Littlejohns P, Ramirez AJ. Influence of delay on survival in patients with breast cancer: a systematic review. *Lancet* 1999;353:1119-26.
 19. McLaughlin JM, Anderson RT, Ferketich AK, Seiber EE, Balkrishnan R, Paskett ED. Effect on survival of longer intervals between confirmed diagnosis and treatment initiation among low-income women with breast cancer. *J Clin Oncol* 2012;30:4493-500.
 20. Umezu T, Shibata K, Kajiyama H, Yamamoto E, Mizuno M, Kikkawa F. Prognostic factors in stage IA-IIA cervical cancer patients treated surgically: does the waiting time to the operation affect survival? *Arch Gynecol Obstet* 2012;285:493-7.
 21. Perri T, Issakov G, Ben-Baruch G, Felder S, Beiner ME, Helpman L, et al. Effect of treatment delay on survival in patients with cervical cancer: a historical cohort study. *Int J Gynecol Cancer* 2014;24:1326-32.
 22. Walsh SR, Gilson NL, Brown K, Novell JR. Trends in colorectal cancer survival following the 2-week rule. *Colorectal Dis* 2007;9:207-9.
 23. Zafar A, Mak T, Whinnie S, Chapman MA. The 2-week wait referral system does not improve 5-year colorectal cancer survival. *Colorectal Dis* 2012;14:e177-80.
 24. Ramos M, Esteva M, Cabeza E, Campillo C, Llobera J, Aguiló A. Relationship of diagnostic and therapeutic delay with survival in colorectal cancer: a review. *Eur J Cancer* 2007;43:2467-78.
 25. Currie AC, Evans J, Smith NJ, Brown G, Abulafi AM, Swift RI. The impact of the two-week wait referral pathway on rectal cancer survival. *Colorectal Dis* 2012;14:848-53.
 26. Grotenhuis BA, van Hagen P, Wijnhoven BP, Spaander MC, Tilanus HW, van Lanschot JJ. Delay in diagnostic workup and treatment of esophageal cancer. *J Gastrointest Surg* 2010;14:476-83.
 27. Kotz BS, Croft S, Ferry DR. Do delays between diagnosis and surgery in resectable oesophageal cancer affect survival? A study based on West Midlands cancer registration data. *Br J Cancer* 2006;95:835-40.
 28. Sharpe D, Williams RN, Ubhi SS, Sutton CD, Bowrey DJ. The "two-week wait" referral pathway allows prompt treatment but does not improve outcome for patients with oesophago-gastric cancer. *Eur J Surg Oncol* 2010;36:977-81.
 29. Myrdal G, Lambe M, Hillerdal G, Lamberg K, Agustsson T, Stahle E. Effect of delays on prognosis in patients with non-small cell lung cancer. *Thorax* 2004;59:45-9.
 30. Pacifico MD, Pearl RA, Grover R. The UK Government two-week rule and its impact on melanoma prognosis: an evidence-based study. *Ann R Coll Surg Engl* 2007;89:609-15.
 31. Raptis DA, Fessas C, Belasyse-Smith P, Kurzwinski TR. Clinical presentation and waiting time targets do not affect prognosis in patients with pancreatic cancer. *Surgeon* 2010;8:239-46.
 32. Redaniel MT, Martin RM, Gillatt D, Wade J, Jeffreys M. Time from diagnosis to surgery and prostate cancer survival: a retrospective cohort study. *BMC Cancer* 2013;13:559.
 33. Menczer J, Krissi H, Chetrit A, Gaynor J, Lerner L, Ben-Baruch G, et al. The effect of diagnosis and treatment delay on prognostic factors and survival in endometrial carcinoma. *Am J Obstet Gynecol* 1995;173(3 Pt 1):774-8.
 34. Matsuo K, Opper NR, Ciccone MA, Garcia J, Tierney KE, Baba T, et al. Time interval between endometrial biopsy and surgical staging for type I endometrial cancer: association between tumor characteristics and survival outcome. *Obstet Gynecol* 2015;125:424-33.
 35. Nanthamongkolkul K, Hanprasertpong J. Longer waiting times for early stage cervical cancer patients undergoing radical hysterectomy are associated with diminished long-term overall survival. *J Gynecol Oncol* 2015;26:262-9.
 36. Stitzenberg KB, Sigurdson ER, Egleston BL, Starkey RB, Meropol NJ. Centralization of cancer surgery: implications for patient access to optimal care. *J Clin Oncol* 2009;27:4671-8.
 37. Bilimoria KY, Ko CY, Tomlinson JS, Stewart AK, Talamonti MS, Hynes DL, et al. Wait times for cancer surgery in the United States: trends and predictors of delays. *Ann Surg* 2011;253:779-85.
 38. Birkmeyer JD, Siewers AE, Marth NJ, Goodman DC. Regionalization of high-risk surgery and implications for patient travel times. *JAMA* 2003;290:2703-8.
 39. Department of Health, National Health Service. Cancer reform strategy. London: National Health Service; 2007.
 40. The Lung Cancer Working Party of the British Thoracic Society Standards of Care Committee. BTS recommendations to respiratory physicians for organising the care of patients with lung cancer. *Thorax* 1998;53 Suppl 1:S1-8.
 41. Alberts WM, Bepler G, Hazelton T, Ruckdeschel JC, Williams JH Jr; American College of Chest Physicians. Lung cancer: practice organization. *Chest* 2003;123(1 Suppl):332S-337S.
 42. Birkmeyer JD, Sun Y, Wong SL, Stukel TA. Hospital volume and late survival after cancer surgery. *Ann Surg* 2007;245:777-83.

