Development of a Virtual Multidisciplinary Lung Cancer Tumor Board in a Community Setting

By Marvaretta M. Stevenson, MD, Tonia Irwin, Terry Lowry, MD, Maleka Z. Ahmed, MD, Thomas L. Walden, MD, Melanie Watson, MSN, ANP-C, and Linda Sutton

Duke University Health System, Durham; Gibson Cancer Center; and Southeastern Regional Medical Center, Lumberton, NC

Abstract

Purpose: Creating an effective platform for multidisciplinary tumor conferences can be challenging in the rural community setting. The Duke Cancer Network created an Internet-based platform for a multidisciplinary conference to enhance the care of patients with lung cancer. This conference incorporates providers from different physical locations within a rural community and affiliated providers from a university-based cancer center 2 hours away. An electronic Web conferencing tool connects providers aurally and visually.

Methods: Conferences were set up using a commercially available Web conferencing platform. The video platform provides a secure Web site coupled with a secure teleconference platform to ensure patient confidentiality. Multiple disciplines are invited to participate, including radiology, radiation oncology, thoracic surgery, pathology, and medical oncology. Participants only need telephone access and Internet connection to participate.

Results: Patient histories and physicals are presented, and the Web conferencing platform allows radiologic and histologic images to be reviewed. Treatment plans for patients are discussed, allowing providers to coordinate care among the different subspecialties. Patients who need referral to the affiliated university-based cancer center for specialized services are identified. Pertinent treatment guidelines and journal articles are reviewed. On average, there are 10 participants with one to two cases presented per session.

Conclusion: The use of a Web conferencing platform allows subspecialty providers throughout the community and hours away to discuss lung cancer patient cases. This platform increases convenience for providers, eliminating travel to a central location. Coordination of care for patients requiring multidisciplinary care is facilitated, shortening evaluation time before definitive treatment plan.

Introduction

Multidisciplinary tumor conferences provide an opportunity to enhance patient care by facilitating diverse input for optimal patient treatment. The engagement of multiple disciplines in the treatment planning process is thought to improve outcomes for patients with cancer and is an integral part of the care provided by major cancer centers.^{1,2} Nonetheless, data supporting the efficacy of formalized multidisciplinary discussions in tumor conferences are somewhat limited, and investigators struggle with the definition of efficacy. In a 2007 prospective study conducted in France—where the multidisciplinary approach for patients with cancer had been established by law—Leo et al of the Groupe d'Oncologie Thoracique Azureen concluded that multidisciplinary discussion of thoracic cancer cases was indeed efficacious.³ The authors noted a high degree of concordance between treatment plans developed in conference and the treatment actually administered, with statistically nonsignificant lower 1-year survival rates for those patients for whom there was discordance. Kurpad et al⁴ and Wheless et al⁵ have concluded that multidisciplinary involvement in the development of treatment plans significantly affects the care of patients with urologic and head and neck malignancies, respectively. Although efficacy has been difficult to document for multidisciplinary tumor conferences, Vinod et al⁶ in New South Wales, Australia suggested that lack of access to lung cancer specialists can compromise survival and adversely affect outcomes.

With approximately 85% of patients with cancer receiving their care in community cancer centers, finding effective mechanisms for multidisciplinary tumor boards has become important.⁷ Creating an effective platform for subspecialty cross-discipline discussion in the rural community setting, where the volume of individual types of cancers and availability of subspecialized providers are limited, can be additionally challenging. This is an issue here in the United States and internationally.⁸ The Duke Cancer Network, committed to providing clinical care, education, and research for patients through affiliations with hospitals in relatively rural locations throughout North Carolina, created an Internet-based platform for a multidisciplinary lung cancer tumor conference. The purpose was to enhance the care of patients lung cancer in the community. This conference incorporates providers from different physical locations within the community as well as affiliated providers from a remote university-based cancer center.

There are multiple methods of conducting tumor boards, including face-to-face, video, and Web conferencing.⁸⁻¹² Traditional face-to-face meetings are the most common but may be difficult in the community setting, especially in rural areas, where subspecialized providers may not participate in the same practices and the demands of a busy clinical practice limit physician engagement at centralized locations. Telemedicine, with video or Web conferencing, can provide a necessary service for these rural areas. Telemedicine multidisciplinary tumor boards

may be cost effective for clinicians compared with face-to-face meetings because they increase the time available for other duties.¹³ Video conferencing requires audio and video equipment, in addition to specialized software, to be available. This can be financially and technically challenging for some rural clinics. Web conferencing uses an Internet-based platform, which is readily available to most clinic sites and can be used to communicate in a tumor board setting.

We set out to develop a multidisciplinary conference that gives local community providers access to university-based providers without the need for patient referrals or traveling to discuss special patient cases with treatment questions. This facilitates treatment plans and communication between subspecialties, in addition to providing opinions from a university-based provider. A Web-based platform was chosen because of its ease of use and the minimal technical support required.

Methods

Development of the virtual multidisciplinary lung cancer conference began in February 2009. The video portions of the conferences were set up using the Adobe Connect web conferencing platform. The audio portion of the conferences used Adobe Connect's partner Premier Global to create a telephone bridge. The Duke Cancer Network provides access to the Web conferencing platform through a site license that requires an annual fee. The Web conferencing software provides a secure Web site for conference participants in order to ensure patient confidentiality. The conference can be viewed only through a secure Web site, and only by invited guests. The URL for the meeting is sent to participants through secure e-mail. Participants must download the software to the computer they plan to use before the scheduled conference. Once the software is loaded onto participants' computers, participants only need to click on the URL link provided to access the conference. The software prompts the participants to activate the teleconference portion. Participants can use desktops, laptops, or mobile devices including tablets and smart phones. Case information is carefully de-identified and incorporated into a slideshow (PowerPoint presentation) to respect Health Insurance Portability and Accountability Act requirements. The slideshows are uploaded to the conference platform. A designated coordinator at the community site provides e-mail and personal reminders to participants and assembles the slide presentations for uploading. A designated coordinator at the university uploads the slide set to the Web conferencing platform and initiates and monitors the software at the time of the conference. The university-based coordinator controls and provides presenter rights to appropriate speakers to enable them to control the slides; use the pointer and other drawing tools; and share computer desktops to allow sharing of national guidelines, literature, or images.

Physicians and other clinical providers from a university-based academic hospital, the local cancer center, and local community hospital are connected for the conferences (Figure 1). Multiple disciplines are invited to participate, including radiology, radiation oncology, thoracic surgery, pathology, pulmonology, and medical oncology. Support staff for the providers and clinical

Figure 1. Physicians and other clinical providers from a university-based academic hospital, the local cancer center, and local community hospital are connected for the conferences.

research coordinators are also invited to assist in coordination of care. Participants only need telephone access, via landline or cellular technology, and internet connection to participate, which are readily available at their place of work. The Virtual Multidisciplinary Lung Cancer Tumor Board was scheduled on a regular basis on the same day of the week, alternating with a regularly scheduled, face-to-face general tumor board.

Results

The first virtual tumor board occurred on December 14, 2009. The conferences are held at noon on Mondays once or twice a month, depending on the availability of patient cases. Reminder e-mails are sent out to participants. During the week before the conference, cases are submitted by e-mail to the coordinator, who can then arrange pathology and radiology input. The case presentations are put together into a slide deck presentation. The pathologist uses a photomicroscope to photograph histologic images and place them into the slideshow. Snapshots from radiologic images are placed into the slide deck.

The majority of the patients presented have non-small-cell lung cancer, in line with the prevalence of this disease compared with small-cell lung cancer. Patient histories and physicals are presented by the primary oncology provider. This includes information on the patient's presenting symptoms, Eastern Cooperative Oncology Group performance status, and disease work-up to date. Radiologic and histologic images are reviewed by the group. If participants want to review an entire radiologic study, such as a complete computed tomography scan instead of just a snapshot, this can be accomplished by allowing the presenter to share their computer's desktop with the complete scan available. The patient's disease stage and treatment plans are discussed, allowing providers to coordinate care among the different subspecialties. Patients who need referral to the affiliated university-based cancer center for specialized services are identified. Pertinent treatment guidelines, such as those from the National Comprehensive Cancer Network and ASCO, along with journal articles related to the patient's case, are presented during the conference. Other aspects of patient care, such as clinical trial eligibility and obtaining biopsies for molecular test-

Table 1. Conference Participation

Variable	2011	2012
No. of conferences	10	13
Average No. of participants	10	10
Average No. of cases per conference	1.7	1.7
Cases discussed (range)	1-3	1-4
Total No. of cases discussed	17	22

ing, are also discussed. On average, there are 10 participants, with one or two cases presented per session (Table 1). The sessions last 30 to 60 minutes.

The tumor conference did face challenges, particularly in the early period. Participation in the multidisciplinary conference developed over a period of several months. The initial conferences were sparsely attended, with participation only from medical and radiation oncology. However, the engagement of clinical champions from both medical and radiation oncology and the regularity of the scheduling encouraged participation from other disciplines. This was critical to building participation. Within 2 to 3 months of initiation, participation had grown to include most of the disciplines required for robust multidisciplinary discussion of cancer cases.

There have been some technical challenges with the tumor conference as well. Occasionally, the software will disconnect individual participants, but the ease of use—one click needed to reconnect—made for minimal disruption when this occurred. At one point, the conference coordinator attempted to use internet telephony with a voice over Internet protocol (VOIP) for the audio portion, but the resultant audio feedback proved to be disruptive and not practical when more than one or two participants used VOIP.

Surveys were sent out to tumor board participants to obtain their opinions on the virtual tumor conference. Of 20 surveys sent out, 10 were returned. Six were completed by physicians, and the others were completed by a nurse practitioner, research staff, administrative staff, or tumor registry staff. The majority of participants (60%) thought the day and time of the virtual tumor board were convenient. Ninety percent of participants felt the multidisciplinary tumor board aided patient care, especially with review of the radiographic and pathology images. Everyone agreed that the duration of the tumor board was appropriate. Seventy percent felt that the conference improved communication and referral times between the subspecialists taking care of patients with lung cancer. Forty percent of participants preferred virtual tumor boards to face-to-face tumor boards, although 40% were neutral and 20% preferred face-to-face meetings. Overall, 70% planned to continue to participate in the virtual tumor board. For those with a barrier to participation, having another meeting at the same time of the conference was the most common reason.

Discussion

The use of a Web conferencing platform allows subspecialty providers at widely dispersed geographic locations to participate in the

discussion of treatment plans for complex lung cancer patient cases. The enhanced accessibility of the conference increases convenience for providers, eliminates travel time to a central location for the conference, and can easily be incorporated into their schedule. Providers can participate in cases that are relevant to their discipline or the entire conference with relatively limited effort and disruption to their own schedule. The conference assists the staging of patients and identifies further work-up that may be required for patient treatment. Furthermore, coordination of care for patients requiring multidisciplinary involvement is facilitated, shortening evaluation time before the creation of a definitive treatment plan. Potential clinical trial candidates are also identified. On the basis of survey results, the majority of conference participants feel the conference aids patient care and plan to continue to attend the virtual tumor board.

Web conferencing is an attractive method of telemedicine because no additional equipment is required, such as videoconferencing audiovisual equipment. Most providers have access to the Internet and a telephone line through their clinics. This reduces overall costs for the tumor board conference, especially in a rural community practice. Overall, this conference provides an essential service to the providers and patients.

Acknowledgment

Presented as a poster presentation at the ASCO Quality Care Symposium, San Diego, CA, November 30-December 1, 2012.

Authors' Disclosures of Potential Conflicts of Interest

Although all authors completed the disclosure declaration, the following author(s) and/or an author's immediate family member(s) indicated a financial or other interest that is relevant to the subject matter under consideration in this article. Certain relationships marked with a "U" are those for which no compensation was received; those relationships marked with a "C" were compensated. For a detailed description of the disclosure categories, or for more information about ASCO's conflict of interest policy, please refer to the Author Disclosure Declaration and the Disclosures of Potential Conflicts of Interest section in Information for Contributors.

Employment or Leadership Position: None **Consultant or Advisory Role:** Linda M. Sutton, GW Pharm, Data Safety Monitoring Committee (C) **Stock Ownership:** None **Honoraria:** None **Research Funding:** Marvaretta M. Stevenson, Pfizer; Linda M. Sutton, Eli Lilly (principal investigator) **Expert Testimony:** None **Other Remuneration:** None

Author Contributions

Conception and design: Marvaretta M. Stevenson, Linda M. Sutton

Administrative support: Tonia Irwin, Melanie Watson

Provision of study materials or patients: Terry Lowry, Maleka Z. Ahmed, Thomas L. Walden

Collection and assembly of data: Tonia Irwin, Linda M. Sutton

Data analysis and interpretation: Marvaretta M. Stevenson, Linda M. Sutton

Manuscript writing: Marvaretta M. Stevenson, Linda M. Sutton

Final approval of manuscript: All authors

Corresponding author: Marvaretta M. Stevenson, MD, 3100 Tower Blvd, Ste 600, Durham, NC 27707; e-mail: steve041@mc.duke.edu.

DOI: 10.1200/JOP.2013.000882

References

1. Axford AT, Askill C, Jones AJ: Virtual multidisciplinary teams for cancer care. *J Telemed Telecare* 8:3-4, 2002 (suppl 2)
2. Stephens MR, Lewis WG, Brewster AE, et al: Multidisciplinary team management is associated with improved outcomes after surgery for esophageal cancer. *Dis Esophagus* 19:164-171, 2006
3. Leo F, Venissac N, Poudenx M, et al: Multidisciplinary management of lung cancer: How to test its efficacy? *J Thorac Oncol* 2:69-72, 2007
4. Kurpad R, Kim W, Rathmell WK, et al: A multidisciplinary approach to the management of urologic malignancies: Does it influence diagnostic and treatment decisions? *Urol Oncol* 29:378-382, 2011
5. Wheless SA, McKinney KA, Zanation AM: A prospective study of the clinical impact of a multidisciplinary head and neck tumor board. *Otolaryngol Head Neck Surg* 143:650-654, 2010
6. Vinod SK, O'Connell DL, Simonella L, et al: Gaps in optimal care for lung cancer. *J Thorac Oncol* 3:871-879, 2008
7. Krasna M, Petrelli N, Niederhuber J: The National Cancer Institute Community Cancer Centers Program: A new paradigm for cancer care in the community setting. *Am Soc Clin Oncol Ed Book* 77-79, 2010
8. Kunkler IH, Fielding RG, Brebner J, et al: A comprehensive approach for evaluating telemedicine-delivered multidisciplinary breast cancer meetings in southern Scotland. *J Telemed Telecare* 11:71-73, 2005 (suppl 1)
9. Bauman G, Winquist E, Chin J: A pilot study of regional participation in a videoconferenced multidisciplinary genitourinary tumor board. *Can J Urol* 12: 2532-2536, 2005
10. Delaney G, Jacob S, Ledema R, et al: Comparison of face-to-face and videoconferenced multidisciplinary clinical meetings. *Australas Radiol* 48:487-492, 2004
11. Dickson-Witmer D, Petrelli NJ, Witmer DR, et al: A statewide community cancer center videoconferencing program. *Ann Surg Oncol* 15:3058-3064, 2008
12. Fielding RG, Macnab M, Swann S, et al: Attitudes of breast cancer professionals to conventional and telemedicine-delivered multidisciplinary breast meetings. *J Telemed Telecare* 11:S29-S34, 2005 (suppl 2)
13. Stalfors J, Björholt I, Westin T: A cost analysis of participation via personal attendance versus telemedicine at a head and neck oncology multidisciplinary team meeting. *J Telemed Telecare* 11:205-210, 2005