

BREAST CANCER AND SENTINEL LYMPH NODE BIOPSY
New Standard of Care
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Finding out you are that one women in nine to be diagnosed with breast cancer is a concern for all Canadian women. If losing a breast is not enough insult for one person to endure; serving a life sentence of complications because of the morbidity associated with the traditional standard of care, is feared as much as the disease itself. Statistic Canada projects in 2008, 22,400 women will be diagnosed with breast cancer, and an estimated 5,300 will die. 431 Canadian women will be diagnosed with breast cancer every week, which 102 will die “The epidemiology of breast cancer as baby boomers turn 50 years of age marks a dramatic rise in the prevalence of breast cancer” (Whitman & Reintgen, 1999, p. 72). Increased public awareness and knowledge of new surgical techniques and advancements places surgeons under close scrutiny to provide the most current and least invasive diagnostic and surgical interventions. However; with today’s economic health care constraints, surgeons must not only look at new surgical options that improve efficiency and risk factor outcomes for patient’s, but better cost and resource utilization procedures as well.

With the introduction of the sentinel lymph node biopsy, the need for axillary node dissection as the standard of practice is losing credibility among specialists. Lymph node dissection provides pertinent information about the degree of cancer spread, but it is the most controversial topic related to breast cancer treatment today? Researchers believe that sentinel lymph node biopsy for the staging of breast cancer will replace the axillary node dissection as the standard of care.

The study of lymphatic cancer spread has been examined by many specialists over the centuries. Halstead’s theory of lymphatic spread was popular in the 1940’s and 1950’s. It was thought that cancer spread almost entirely by local spread and lymphatics.

Therefore, radical surgery was believed to offer the best chances of survival. In fact, patients with a Halstead Mastectomy (removal of the breast, pectoralis muscle and axillary nodes) did not have better outcomes than those with traditional mastectomy and limited node dissection. Node dissection does provide the specialists with the staging information needed to predict future spread and determine which form of adjunct therapy is needed, if any (Jeffrey et al, 2000). Sentinel biopsy takes the theory one step further, allowing doctors to identify and remove the one or two nodes that may be positive for disease, thus avoiding a full axillary node dissection and the associated complications for the patient (Gomes, A., Nov, 2006, personal communication).

With the introduction and validation of sentinel lymph node biopsy as an alternative for breast cancer staging, it is believed that much of the controversy will be clarified, and patients will have a favorable alternative to breast cancer treatment.

Research findings over the past 20 years supports that axillary node dissection, has little, if any bearing on the spread of disease. Surgical removal of the tumor, followed by radiation and removal of one or two lymph nodes is enough to determine the type of adjunct therapy necessary (Craig, n.d.). The accuracy rate noted utilizing sentinel lymph node biopsy supports that this could replace the traditional staging technique as the preferred option for staging (Krag et al., 1998).

The sentinel node is defined as “the node on watch” (Craig n.d., p.1). It is the first node of the lymphatic system to receive drainage from the cancerous tumor. This procedure requires the collaboration of several health care disciplines to achieve the desired outcome for the patient. A radiocolloid agent is injected around the tumor site by a radiologist at least three to four hours pre-op. This agent travel through the lymphatic

system and becomes entrapped by the sentinel node. Once in the operating room, the surgeon injects a blue dye substance around the tumor site which also becomes entrapped by the node. This dye helps the surgeon visualize the location and number of sentinel nodes present (sometimes there are 2 or 3). A gamma probe is used to detect the radioactive emissions, or “hot spots”, and directs the surgeon to the location of the sentinel node(s). Through the use of a small incision at the location of radioactivity, the surgeon examines the nodes for the presence of radioactivity and/or blue dye, indication of sentinel node(s) (Craig, n.d.). Dissection of the node(s) is performed and radioactivity measurements utilizing the gamma probe is completed prior to the node(s) removal (in vivo) and following (ex vivo) and documented. A background measurement is performed and documented to ensure radioactivity levels are not greater than 10% post node removal. A high background measurement of the nodal bed could be indicative of additional sentinel nodes. Pathological examination of the node (s) is then performed to determine if any of the cells with the node(s) appear cancerous. The sentinel node provides the pathologist with the node(s) most likely to foster the metastatic spread resulting in a closer examination and accurate lymph node status. Cancer cells do not pick and chose which node(s) it wishes to invade, so if the sentinel node is negative, other nodes which are located at higher levels within the axilla are also negative 99% of the time (Craig, n.d.). If the node is diagnosed as positive, its degree of cell invasion will determine if additional surgery is needed or if adjunct therapy is necessary.

The potential for complications are present as for all surgical procedure, but overall the incidence is low. The need for additional surgery, if the sentinel node is found positive, is a major drawback. The surgeons diagnostic findings and assessment expertise

plays a significant role in selecting the right surgical intervention for each patient (Breastcancer.org, 2003).

The greatest complication related to sentinel node biopsy is the false negative rate: this rate could lead to an incorrect decision about treatment. This is defined as: “the number of patients with axillary sentinel nodes that are tumor free, but who have other non-sentinel lymph nodes with metastatic disease” (Jeffrey et al., 2000, p. 227). Currently a false negative rate of < 5% for axillary node dissection is an accepted rate (Chang & Diehl, 2007). A surgeons’ learning curve has a significant impact on the false negative rate. Evidence supports surgeons who perform this technique on a regular basis will return more accurate results from the technique. Once a surgeon has performed 20-30 cases in where the sentinel lymph node is identified in >90% of the cases and the false negative rate is <5% the surgeon “goes off protocol” and can perform sentinel lymph node biopsy without a complete axillary node dissection (Chang & Diehl, 2007) Sentinel lymph node biopsy with its low complication rate will be a great improvement for cancer staging, if similar false negative rates can be achieved. Until such time, addressing women’s voice for a less morbid surgical option, offering the sentinel lymph node approach and a limited axillary node dissection is a feasible option (Jeffrey et al., 2000).

Women with early stage, small breast cancers with nodal involvement that is low to moderate, are optimum candidates for sentinel lymph node biopsy. Screening methods must be established by specialists to ensure proper interventions are implemented to obtain optimal patient outcomes (Breastcancer.org, 2003).

Sentinel lymph node biopsy is gaining popularity as the staging technique of choice for breast cancer patients. Upon recognition of the decreased side effects with

sentinel node biopsy, Health Canada, in 2001, endorsed this technique. The committee did however recognize some challenges that will accompany the institution of the procedure over axillary node dissection, the greatest being the surgeons inability to identify the sentinel node and his false negative rate (Imaginis, 2002). In all cases the sentinel lymph node techniques should only be undertaken by qualified team disciplines, (surgeons, radiologists, and pathologists) who have documented accuracy rates (Chang & Diehl, 2007).

As public awareness increases about the advancements of breast cancer surgical options, patients with invasive breast cancer may now have the choice for less invasive management. An innovative and encouraging technique, sentinel lymph node biopsy as a new standard of care for breast cancer patients demonstrates great promise for women and their families afflicted by the disease.

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