The Complexity Of Pain In Post Breast Cancer Lymphedema

Michael J. Brennan, M.D.

Introduction

Lymphedema is an often ignored complication of breast cancer and its treatment, and has been described as the most distressing complication of breast cancer therapy. Despite recent advances in lymphedema treatment and availability of more modern therapies, lymphedema remains a difficult condition to both live with and control. A number of complications have been described in women suffering with lymphedema after breast cancer. These include infection, decreased range of motion, emotional distress, and the potential to develop a very rare second form of cancer, lymphangiosarcoma, in the affected limb. Pain has been described in several clinical reports of women with lymphedema. In addition to the obvious physical discomfort and potential to further lessen quality of life, pain has been implicated as a contributor to depression and other emotional distress in women with upper extremity lymphedema. The purpose of this article is to describe those common pain syndromes encountered in patients with lymphedema, discuss any significant clinical implications, and review the evaluation and potential treatment options for various causes of pain.

Prevalence

Pain has been defined by the International Association for the Study of Pain as "an unpleasant sensory experience associated with actual or potential tissue injury or described in such terms." The prevalence and incidence of pain in lymphedema are not well known. No prospectively controlled data exists, nor are there any large population-based reviews attempting to define the scope of pain in this population. Its prevalence has been reported as ranging from 30 to 60 percent; however, these numbers are based on small studies of women receiving therapy for lymphedema. Therefore, these reports may be biased towards over representation. Clinical experience does suggest that pain is present in a significant number of women with post-axillary node dissection lymphedema. Part of the difficulty in determining the prevalence of pain is that different types of pain are experienced by individuals afflicted with lymphedema. Additionally, pain is a subjective experience, evoking individualized responses and reactions. Furthermore, the taxonomy of pain itself makes for added difficulty in defining the presence and significance. Thus, "discomfort" in the axilla following surgery may not be reported by one individual as pain, whereas another might consider this sensation as being significant pain.

Certainly, several distinct pain syndromes may be encountered. The more common and well known causes include: pain associated with infection, pain from surgical changes in the axilla, postmastectomy pain syndrome, brachial plexopathy and various arthritides. Less common causes of pain include peripheral entrapment neuropathies, pain from vascular compromise and cancer recurrence. An important question remains unanswered: Is lymphedema itself painful, or is pain reported due to concomitant pathologies in the affected arm? Or is pain the result of edema causing increased pressure on certain structures in sensitive areas, such as the carpal tunnel? There is also a relatively common complaint of generalized discomfort, often characterized as a sense of "heaviness," "tightness," "fullness," "pressure" or "stiffness." These descriptors of discomfort, often presaging the actual onset of measurable edema, likely represent the stimulation of pressure sensitive mechanoreceptors and nociceptors. Yet, one individual, on questioning about the presence of "pain," may volunteer the presence of one of these sensations, whereas another might not.

Another issue clouding our understanding of the prevalence and nature of lymphedema-associated pain is a tendency for patients to under-report the presence of pain. Though this may seem counterintuitive, many individuals with a history of cancer, breast or otherwise, deny the presence of pain. This stems from fears and notions of the disease itself, pain representing a potentially ominous sign; concern that the healthcare provider may see the patient reporting pain symptoms as a “bad patient” or as a “complainer”; or under-reporting may represent a patient's cultural or ethnic bias that pain is to be tolerated.

Pain Syndromes

Several different, well defined pain syndromes exist in women who have undergone breast cancer therapy. These syndromes, their diagnosis and treatment will be reviewed.

Infection

Perhaps the most recognized cause of pain in women with lymphedema is bacterial infection. Cellulitis and lymphangitis are well described in lymphedema literature. Not only do infections cause pain in the limb, but severe progression of swelling may develop either concomitantly or following an acute episode. Additionally, systemic symptoms such as fever, lethargy and nausea may be present and be associated with compromise of cardiovascular or pulmonary function. Infection may occur without any obvious cause or following incidental trauma. Rapid diagnosis is easily made based on clinical evaluation.

Treatment with oral antibiotics is typically rendered at home or in an outpatient setting. However, if the patient exhibits signs of systemic illness, or if oral antibiotics do not lead to resolution of pain, then a course of intravenous therapy may be warranted. Clinical experience suggests that the erythema that generally accompanies cellulitis may linger well after the infection has been treated adequately. However, persistent pain, particularly with compression such as when assessing for pitting, may be a clinical indicator of residual infection. Blood testing may be warranted should this discomfort be noted.

Myofascial Pain Syndromes

and Soft Tissue Pain
Myofascial pain syndromes are due to injury of the soft tissues, typically muscles and connective tissue surrounding the breast as well as those tissues that make up the axilla. Clinical experience suggests that this is among the most frequent pain problem encountered in women with breast-cancer-related lymphedema. The spectrum of myofascial pain syndromes in this population ranges from simple limitations in range of motion due to a muscle trigger point to frozen shoulder including adhesive capsulitis. Myofascial pain may arise from the actual surgical trauma to the soft tissues, the immobilization that occurs post operatively or from a combination of these. These problems often are the presenting complaints of individuals to a rehabilitation service, less for the pain but more so because of the functional impact that results. Patients note difficulty in fully abducting and externally fully abducting and externally rotating the arm, thereby rotating the arm, thereby making overhead activities difficult. This is especially pressing when an individual requires proper positioning for radiotherapy following breast conservation surgery. Diagnosis of myofascial pain syndromes is clinical. Physical findings of trigger points, taut bands, tender soft tissues and restrictions in range of motion readily suggest the diagnosis. Occasionally, imaging of the shoulder may be warranted, especially if there is pain with passive range of motion. This might suggest bone involvement or destruction. Treatment is multidimensional and includes stretching and range of motion, anti-inflammatory medication and the judicious application of thermal modalities. Proper therapy is important in so far as lymphatic drainage from the region may be adversely affected with reduction in range of motion in the shoulder region. Selective use of local injections may be considered in those cases where exercise and medications are insufficient.

The development of a tough fibrous cord is a well recognized yet poorly understood phenomenon in women who have undergone axillary dissection. These cords may occur in the axilla, the upper arm or at the elbow. Some data exists to suggest that these are lymphatic tissues. Others have reported them as being inflammatory tissues. Similar to myofascial pain syndromes, these cords may cause restrictions in range of motion and may be painful. Symptomatic relief with mild analgesics and anti-inflammatory medications is usually sufficient. Range of motion exercises may aid in the maintenance of joint function. Clinical experience suggests that these may be self limiting in nature, usually abating in an abrupt fashion.

Neuropathic Pain Syndromes

Post Mastectomy Pain Syndrome is due to surgical trauma of the intercostal brachial nerve. It may be seen in as many as 10% of mastectomy patients. It may be seen in breast conservation surgery, as well, though its incidence is not as well understood. Pain is generally in the lateral chest wall, the axilla and medial upper arm. The pain is often described as burning, dysesthetic and aching. It is often associated with decreased sensation over the involved area, and frequently, trigger points may be noted in the chest wall or axilla. Occasionally a neuroma may be palpated as well.

Diagnosis is generally clinical, based on the history and physical findings. No specific testing is required. Treatment is generally local with massage, TENS, stretching and injections (trigger point or nerve blocks). Acupuncture has not been studied for this pain syndrome, but may represent an attractive alternative. Systemic pharmacotherapy with adjuvant analgesics, such as tricyclic antidepressants, anticonvulsants and oral antiarrythmics may also be required for more severe cases.

Phantom breast pain has been reported in mastectomy patients but has not been reported in women undergoing lumpectomy. Local counter-irritant therapies, acupuncture, TENS and adjuvant analgesics may alleviate symptoms.

Brachial plexopathies have been well described in women who have been treated for breast cancer. Two distinct syndromes have been reported: radiation plexopathy and plexopathy associated with disease recurrence. Lymphedema is more frequently associated with radiation plexopathy; this syndrome is usually seen several months to several years following radiation therapy. Patients often complain of pain, sensory changes, and, occasionally, weakness in the limb. The distribution of symptoms and physical findings is generally confined to those areas receiving innervation from portions of the upper brachial plexus. This includes the shoulder girdle, lateral aspect of both the upper and lower arm, and the lateral hand. Several theories exist as to why the upper portion of the brachial plexus is at particular risk for radiation injury, and include the amount of exposure to radiation fields and the relative protection offered to the lower plexus by superimposed anatomy. Skin changes and lymphedema are frequently encountered at the time of initial presentation. Differential diagnosis includes plexopathies from other causes such as tumor recurrence; epidual disease; and peripheral neuropathy.

Patients with complaints and findings suggestive of involvement of the lower plexus must be considered to have recurrent disease until proven otherwise. It has been suggested that the lower plexus is at risk from compression by either lymphadenopathy arising in the periclavicular lymph nodes or from lesions in the apex of the lung. Lower brachial plexopathies tend to cause weakness in the intrinsic muscles of the hand, and sensory changes in the medial hand and forearm. Additionally, the presence of a Horner’s syndrome, ptosis, miosis, and anhydrosis, is more likely encountered with a compressive lesion of the lower plexus.

All patients presenting with symptoms or findings suggestive of a brachial plexopathy should undergo either magnetic resonance imaging or CT scanning with intravenous contrast enhancement. If the imaging study is negative and symptoms persist, re-imaging every three months should be considered. If a mass is present, then tumor recurrence is likely. If diffuse scarring is seen, radiation fibrosis is probable. However, in those cases where a poorly differentiated abnormality is noted on imaging studies, controversy exists as to the next step. Complimentary imaging may better define the lesion, i.e. MRI scanning as a follow-up to CT studies. Biopsy may provide a definitive diagnosis but may result in additional morbidity.

Another option is electrodiagnosis. Electromyography involves several needle insertions and subsequent probing of muscles. Needle studies will reveal a characteristic myokymic pattern seen with radiation induced plexopathy, yet absent with a plexopathy due to tumor recurrence. However, this author has seen several cases of lymphedema induced by simple needle injury, and therefore cannot advocate the injudicious use of this test because of the potential to cause or exacerbate lymphedema. This is a personal bias. Treatment of pain and any functional impairment due to a plexopathy is typically multidisciplinary in nature. Adjuvant analgesics, TENS, occupational therapy and bracing may all need to be employed.

Certain entrapment neuropathies may be seen in women with upper extremity lymphedema. The most well known is Carpal Tunnel Syndrome, entrapment of the median nerve at the wrist. This is a common cause of pain and numbness in the hand. Patients' may also complain of forearm numbness in the hand, and sensory changes in the medial hand and forearm.
pain as well. The initial presenting symptoms may be dysesthesias that awaken the patient from sleep that rapidly improve with shaking of the hands. Tapping of the wrist over the course of the nerve will produce tingling and pain into the lateral hand. Phalen’s test, maximal wrist flexion, will often reproduce symptoms in less than one minute. Nerve conduction velocities will provide definitive diagnosis in borderline cases. Treatment includes bracing, edema reduction, vitamin therapy and exercise. In some patients, specifically those facing functional compromise, minimally invasive carpal tunnel release may be necessary. One author has reported no substantial swelling in a series of cases so treated. Clinical experience suggests that individuals undergoing treatment for lymphedema who also have carpal tunnel syndrome should avoid therapies that might significantly increase the pressure within the carpal tunnel. Specifically, intermittent pneumatic compression should be avoided. Other entrapment neuropathies of the median nerve have not been reported in patients with lymphedema.

Ulnar nerve entrapment in the medial forearm or the elbow may produce pain in the medial hand and forearm. This is a very unusual cause of pain in this population and must be differentiated from a brachial plexopathy. Nerve conduction studies will provide definitive diagnostic information. Treatment includes bracing and edema reduction. Other exacerbating factors should be addressed to try and ameliorate symptoms. Example: proper positioning with the elbow avoiding maximal flexion may lessen symptoms.

Vascular Pain

Deep vein thrombosis may cause pain and swelling in the arm. A severe form of venous occlusion which may be associated with venous thrombosis is the superior vena cava syndrome. Axillary vein or more distal veins of the extremity may become obstructed and produce pain and swelling. The limb generally has evidence of venous outflow obstruction including distended superficial veins, a dusky or bluish color and swelling. Pain may develop either acutely or subacutely. Diagnosis may be readily made with ultrasound evaluation of the major venous structures. Treatment involves compressive sleeves, anti-inflammatory medication and occasionally anti-thrombotic therapy. All treatments, including the intermittent pneumatic pump, should be avoided during active therapy of a deep vein thrombosis.

Arthritis and Joint Pain

A variety of joint pains may be seen in women with lymphedema. Osteoarthritis, rheumatoid arthritis and certain oligoarthopathies such as gout and pseudogout not only cause pain but have the potential to worsen edema.

Acute inflammatory arthropathy may be difficult to differentiate from trauma or infection. Careful history and physical examination supplemented by appropriate imaging and blood work should make the proper diagnosis. Treatment requires appropriate use of nonsteroidal anti-inflammatory medications. Bracing and applications of modalities may also bring about symptomatic relief. Systemic agents may be of benefit in cases of inflammatory or deposition arthropathies.

Evaluation of Pain in the Lymphedema Patient

Queries concerning the presence of pain should be made at the initial and all subsequent follow up visits. If pain is identified, the clinician should attempt to identify the likely cause and then devise an appropriate treatment strategy. Areas that should be reviewed when inquiring into a pain complaint include its location, quality and severity; factors that worsen and ease the pain; and, whether it is progressing, easing or static. Accompanying symptoms such as sensory complaints and weakness should suggest a possible neuropathic pain (plexopathy, entrapment neuropathy). Fever, warmth in the arm and a history of trauma may suggest an infectious cause. Acute joint swelling and pain may be due to gout or joint trauma. Finally, detailed assessment of functional and daily life activities should be made.

Pain therapy may be done in concert with most edema reduction techniques. As described above, edema reduction techniques that rely on increasing interstitial pressure should be avoided, or, at least, performed with caution in patients with certain pain syndromes. This author recommends against pneumatic pumping in patients with carpal tunnel syndrome. Additionally, acute infection and venous thrombosis also should be treated before embarking on aggressive, pressure-based, anti-edema therapies.

Conclusion

Pain appears to be a frequent complication encountered in the management of lymphedema. Certain qualities of pain may suggest its etiology. Evaluation and treatment should be done as quickly as possible so as to lessen any unnecessary suffering and treat remediable causes before edema worsens.

Bibliography


Michael J. Brennan, M.D., is a Physiatrist in practice in CT, Chief of Rehabilitation Medicine at Bridgeport Hospital and Medical Director of the Ahlbin Centers for Rehabilitation Medicine. He has published several articles and presented on pain and psyche involvement in women with lymphedema.