Nonpharmacologic Approaches to Pain, Engorgement, and Plugging in Lactation

Applying Physical Therapy Techniques From Breast Cancer Care to Breastfeeding Patients

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Introduction: Breast and nipple pain is one of the most common reasons why mothers stop breastfeeding earlier than recommended. Once conditions such as subacute mastitis, oversupply, and dermatitis have been treated or ruled out, functional breast pain may persist.

Review: We describe validated physical therapy techniques that may reduce chronic pain in breastfeeding. These techniques include lymphatic massage, reverse-pressure softening, kinesiology taping, neural mobilization, cupping, and therapeutic ultrasound.

Conclusion: While more commonly used in the breast cancer population after radiation and surgery, we propose these techniques may also prove efficacious in breastfeeding patients as well.

Keywords: ultrasonic therapy; lymphatic massage; mastodynia; breast engorgement; nerve entrapment

Breast and nipple pain, engorgement, and recurrent plugs leading to mastitis are common reasons why mothers stop breastfeeding earlier than recommended (Berens & Brodribb, 2016; Berens, Eglash, Malloy, & Steube, 2016). Despite their prevalence, these remain challenging conditions to treat. Pain with breastfeeding, nipple pain, and breast engorgement are associated with a 2.31, 2.17, and 1.97 increased odds of weaning earlier than intended (Odom, Li, Scanlon, Perrine, & Grummer-Strawn, 2013). One in eight mothers report early weaning because of pain, difficulty latching, and milk-supply issues. Women with higher body mass indexes (BMIs) and postpartum depression are more likely to have a shorter breastfeeding duration than those without (Stuebe et al., 2014).

In the past, patients with deep, chronic breast pain in breastfeeding were often treated for yeast infections, though no scientific evidence exists to support this diagnosis (Jiménez et al., 2017). More current literature

Submitted: May 26, 2019. Accepted: September 29, 2019. has established subacute mastitis, persistent hyperlactation ("oversupply"), and dermatitis as causes of breast pain (Witt, Burgess, Hawn, & Zyzanski, 2014). Once these conditions have been treated or ruled out, patients nevertheless may experience persistent pain, plugging, and/or engorgement (Berens et al., 2016). Because the true incidence of idiopathic symptoms is not well known, management can be challenging.

Recent reports describe the efficacy of pharmacologic interventions, such as antihistamines and beta blockers, in functional breast pain (Muddana, Asbill, Jerath, & Stuebe, 2018). Community-based peer support is effective at increasing breastfeeding continuation in low- and middle-income countries, but did not show the same effect in high-income countries (Shakya et al., 2017). Counseling has shown to be helpful for this population when provided in multiple settings, including through health professionals, peer support, and in the family and home environment (Sinha et al., 2015).

We propose an alternative stepwise approach to these patients that utilizes established breast physical therapy interventions prior to consideration of pharmacologic agents. In addition to treatment of pain, these techniques can employed for relief of engorgement, plugging, and inflammation. While a medical professional should supervise the care of all breastfeeding patients with a persistent concern, lactation consultants can employ

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basic techniques, such as lymphatic massage, in transient engorgement, and teach to patients to continue at home.

Physical therapy techniques are widely used for breast pain in the breast cancer population after surgery and radiation therapy. The pain in this population may be related to fibrosis, lymphedema, nerve entrapment, or development of hypersensitivity (Ezzo et al., 2015; Vadivelu, Schreck, Lopez, Kodumudi, & Narayan, 2008). Validated physical therapy techniques for treating these symptoms include lymphatic massage, kinesiology taping, nerve mobilization, and cupping (Basson et al., 2017; Cooper & Kowalsky, 2015; Ezzo et al., 2015; Pekyavaş, Tunay, Akbayrak, Kaya, & Karataş, 2014).

While no existing literature reports the application of these techniques to breastfeeding patients, changes in the lactating breast, such as edema and hypersensitivity, may overlap with that of patients who have had surgery and/or radiation therapy. Therefore, we aim to describe the potential utility of the techniques in the breastfeeding population. Therapeutic ultrasound (TUS), lymphatic massage, and reverse-pressure softening have been well documented in breastfeeding patients, and we also include these in our discussion.

Techniques

Gentle/Lymphatic Massage

In an effort to alleviate plugging, patients may traumatize their breasts with vigorous, deep massage. This may cause increased edema, obstruction, and/or hematoma formation in a highly vascular lactating breast (Figure 1). More effective therapy utilizes a gentle therapeutic massage technique (also known as manual lymphatic drainage or MLD), as demonstrated in techniques for breast lymphedema that may develop after surgery and radiation therapy for breast cancer (Ezzo et al., 2015).

MLD reduces swelling by assisting movement of lymph fluid, decreasing interstitial fluid, and softening fibrosis (Ezzo et al., 2015). MLD can be used to assist with pain and edema resulting from an acute plug, or to remediate edema and microvascular injury caused by excessive deep massage. While physical therapists traditionally have utilized lymphatic massage the most, these simple Figure 1. Deep massage may traumatize the highly vascular lactating breast, leading to microvascular injury and tissue edema.



techniques also can be employed by other medical professionals and lactation consultants for transient conditions such as engorgement. It should be noted that any persistent symptom should always be evaluated by a medical professional.

The technique of MLD is based on the anatomy of the lymphatic system and involves gentle massage of the skin to promote lymphatic flow and facilitate vessel drainage (Ezzo et al., 2015). Gentle traction of the skin is used in this massage technique to assist movement of lymphatic fluid along the superficial lymphatic pathway. For breast lymphatic drainage, massage should begin on the affected side superior to the clavicle at the junction of the internal jugular vein and subclavian vein (Figure 2). Ten small circles are made with the flat of the fingers. This massage should be performed with very light touch and continue with this gentle massage throughout the treatment. Next, 10 small circles should be made in the axilla of the affected breast (Figure 3). Finally, massage should continue via concentric circles radiating from the nipple areolar complex to the clavicle, internal mammary chain, and axillary lymph nodes (Figure 4).

Figure 2. Lymphatic massage begins at the junction of the internal jugular vein and subclavian vein.



Figure 3. Small concentric circles are then performed in the axilla.



Figure 4. Gentle, light touch massage should continue radiating from the nipple areolar complex to nodal basins.



Therapeutic Breast Massage in Lactation

Another gentle massage technique, called therapeutic breast massage in lactation (TBML) is effective at reducing breast and nipple pain, engorgement, and severity of plugged ducts. This involves a gentle massage toward the axillae that alternates with hand expression of breast milk (Figure 5; Witt, Bolman, Kredit, & Vanic, 2016). Education on proper gentle massage technique can improve mother's technique, improving outcomes in breastfeeding and protecting the breast against damage (Witt et al., 2016).

Reverse-Pressure Softening

Reverse-pressure softening, while not directly a massage technique, involves gentle compression of the areola to reduce edema/engorgement and enable a deep and atraumatic baby latch. Reverse-pressure softening has three therapeutic effects, including stimulation of the milk-ejection reflex, reducing excess subareolar tissue resistance, and decreasing breast edema. While some Figure 5. Therapeutic breast massage in lactation (TBML) is a gentle massage toward the axilla alternating with hand expression of breast milk.



Figure 6. K-tape is applied with two pieces cut into five equal strips, applied at the superior aspect of breast and draped circumferentially around the nipple areola.



individual modifications of the technique exist, the general principle involves exerting a steady and gentle positive pressure in an inward direction in an area 1–2 cm around the central areola. This should be done before each attempt to latch for a period of 1–3 minutes and repeated several times depending on level of swelling. This technique can be done by the mother or significant other after being trained by a healthcare professional, or a healthcare professional for initial demonstration or with severe symptoms. (Cotterman, 2004).

Kinesiology Taping

Kinesiology taping can decrease pain or abnormal sensation and decrease congestion of lymphatic fluid or hemorrhages under the skin (Pekyavaş et al., 2014), and should be performed by a medical professional or physical therapist. Kinesiology taping can improve the effects of other compression garments and manual lymph drainage for secondary lymphedema following breast cancer treatment (Pekyavaş et al., 2014).

Kinesiology tape lifts the superficial skin, which opens surface lymphatics. It also provides a massaging effect during movement, and enhances efficiency of deeper lymphatics by allowing maximum contraction and relaxation of the pectoralis muscle (Pekyavaș et al., 2014). The application of kinesiology tape enacts a pressure gradient and draws fluid from the local draining lymph nodes. Because of these lymphatic decongestive benefits, kinesiology tape can be utilized in the breastfeeding population, particularly in the setting of engorgement (Berens & Brodribb, 2016). In breastfeeding patients, kinesiology tape should be applied on clean, dry skin with two pieces for each breast. Each piece, cut into five equal strips, should be applied at the superior aspects of the breast and draped circumferentially around the nipple areolar complex, with about 1 cm of space for infant latch. Tape should avoid the axilla and should be applied with minimal stretch (Figure 6; Brown & Langdon, 2014). It also may be helpful in the setting of chronic functional pain, though more research in this area is needed.

Neural Mobilization

Neural mobilization is the facilitation of movement of neural structures through manual techniques or exercise and should be performed by a physical therapist. A recent systematic review showed neural mobilization to be effective at reducing edema as well as thermal and mechanical hyperalgesia following nerve injury (Basson et al., 2017). A pilot study found accessory joint and neural mobilizations effective at increasing shoulder range of motion after breast cancer surgery (de la Rosa Díaz, Torres Lacomba, Cerezo Téllez, Díaz Del Campo Gómez-Rico, & Gutiérrez Ortega, 2017).

The breast receives rich innervation from the lateral cutaneous branches of the II-VI intercostal nerves, which terminate in the nipple areolar complex (Figure 7; Jaspars, Posma, van Immerseel, & Gittenberger-de Groot, 1997). This innervation pattern may contribute to deep breast pain being referred to the nipple or, alternatively, nipple pain being referred deeper in the breast. Therefore, nerve mobilization technique validated in breast cancer care Figure 7. Rich innervation of the breast extends through parenchyma to terminate in the nipple areolar complex.



Figure 8. Location of intercostal nerves relative to rib.



Figure 9. Intercostal nerve mobilization

may decrease entrapment in engorgement and improve pain.

To mobilize an intercostal nerve, the corresponding rib is located at the lateral chest wall. Nerve mobility is induced with light compression inferior to the rib (Figure 8). This light touch encourages physiologic nerve length and release during the expansion phase of the nerve (Croibier & Barral, 2007). Based on evaluation by a physical therapist experienced in this technique, multiple nerves may be mobilized at one time. The decision to mobilize specific nerves that may be entrapped is based on evaluation and palpation by the physical therapist. We propose a similar technique may improve breast pain in breastfeeding patients (Figure 9).

Cupping

Cupping therapy is a traditional Chinese medicine technique that involves the application of suction by creating a vacuum with bamboo, glass, or plastic cups (Al Bedah et al., 2016) and should be performed by a physical therapist. Cupping creates negative pressure that affects the permeability of local capillaries by causing them to rupture and release histamine, serotonin, and other chemicals. This in turn mobilizes the immune system and improves circulation in that area (Al Bedah et al., 2016).



Cupping therapy was found to be effective at decreasing pain in patients with low back pain and cancer in two randomized clinical trials (RCTs; Kim, Lee, Lee, Boddy, & Ernst, 2011).

In physical therapy practice, a technique that involves gliding of the cups to lift the superficial tissue while the patient actively moves has been termed "Tissue Distraction Release with Movement" (Jam, 2016). Similarly, cupping massage, where the suctioned cups are moved over the skin, is also currently used in physical therapy practice. An RCT found that home-based cupping massage

Figure 10. Cupping technique to improve lymphatic fluid drainage.



Figure 11. Therapeutic ultrasound utilized for pain, engorgement, and plugging.



was as effective as progressive muscle relaxation in reducing pain in patients with chronic neck pain (Lauche et al., 2013). Both dynamic cupping techniques that involve mobilization of tissue and lymphatic fluid may be of benefit to the breastfeeding population as well (Figure 10).

Therapeutic Ultrasound

TUS has been described in breastfeeding patients as a treatment for engorgement and plugged ducts. Medical professionals and physical therapists perform TUS and while it is outside the scope of practice of lactation consultants, they should be familiar with its utility. TUS is a deep-heating agent that uses an alternating electrical current to convert electrical energy into acoustic energy and transmit it through soft tissue. It has both thermal and nonthermal effects, including acceleration of metabolic rate, reduction of pain, increased circulation, and others (Cameron, 2013).

TUS is thought to work for treatment of engorgement, blocked ducts, and mastitis via facilitating milk let-down and subsequently decreasing pain and firmness (Mangesi & Dowswell, 2010). There are two RCTs and one prospective cohort study that demonstrate the effectiveness of TUS in reducing pain and symptoms of engorgement and blocked ducts. The number of treatment sessions ranged from one to seven, with most resolution happening within a week (Lavigne & Gleberzon, 2012; McLachlan, Milne, Lumley, & Walker, 1991; Priyanka et al., 2016).

No studies showed adverse events related to TUS, which suggests this is a safe intervention for breastfeeding women. There is no standardized protocol for use of TUS for breastfeeding, but one set of parameters that was successful in a prospective cohort study by Cooper and Kowalsky was TUS frequency of 1 MHz, intensity 2.0 W/cm2, for 5–6.5 minutes for a treatment area 2– 3 times the size of effective radiating head (Figure 11; Cooper & Kowalsky, 2015). More research should be done to determine the most effective dosing and treatment parameters for TUS in breastfeeding.

Conclusion

While pharmacologic and behavioral interventions may effectively treat pain, engorgement, and plugging in the breastfeeding population, we propose that physical therapy techniques validated in breast cancer care may be applied to lactating patients as well. These techniques can reduce breast lymphedema, nerve entrapment, and inflammation. Lymphatic massage, reverse-pressure softening, and therapeutic ultrasound have been described in the breastfeeding population. We recommend additional research in breastfeeding patients on other physical therapy techniques such as neural mobilization. In conjunction with patient's care team of lactation consultants, physicians, nurses, and mental health professionals, physical therapists are highly qualified to perform these nonpharmacologic interventions to relieve pain, plugging, and engorgement in breastfeeding patients.

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