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Perspective article

The manual lymphatic drainage of physical therapy for care of the facial swelling and pain after oral and maxillofacial surgery

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The swelling and pain on the affected side of the face are the common problems after dental surgery such as the tooth extraction. The reason related to the facial swelling and pain may be the destruction of the gingival, alveolar, and jawbone tissues after surgery, which causes the local inflammation and obstruction of lymph flow.[1] The inflammatory reaction of the tooth extraction wound will stimulate the trigeminal nerve and further cause pain. In addition, there are approximately 600 to 1000 lymph nodes

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in a normal adult body, of which about one-third, or 200 to 300, are in the neck.[2] If there is inflammation inside the mouth, it may gradually spread along the soft tissue spaces to the deep neck tissues and cause lymphedema of the head and neck. In general, the average healing time for the alveolar socket after the tooth extraction is about 7–10 days. The recovery period for the wisdom tooth extraction may take longer and is often accompanied by severe facial swelling and unbearable pain.[3] If the swelling and pain on the affected side of the face after the tooth extraction is not treated promptly and properly, it may cause inflammation of the gingival, alveolar, and jawbone tissues, leading to inflammation of the lymph nodes and swelling of the local lymph nodes, and eventually cause deep neck infection.[1] Understanding the distribution and drainage of the head and neck lymphatic system can help the dentists to assist the patients with the oral care after dental surgery to relieve their facial swelling and pain, thereby reducing damage to the surrounding tissues of the wound. This article reported a novel concept regarding the oral care and efficacy evaluation of physical therapy manual lymphatic drainage in the patients with postoperative facial swelling after mainly dental surgery.

Initially, the manual lymphatic drainage has been used in breast cancer patients undergoing mastectomy and regional lymph node dissection prior to breast reconstruction, with significant improvement in pain and swelling.[4] There are many potential cases for the manual lymphatic drainage in plastic surgery patients. The initial postoperative period is one of the most critical stages in the cosmetic plastic surgery. Moreover, various dental specialties involve surgery or manipulation of the hard and soft tissues of the oral and maxillofacial region. Therefore, there are many potential uses and applications of the manual lymph drainage in dental patients after oral and maxillofacial surgery, as shown in Fig. 1.

In terms of the dentistry, the main postoperative problem is the facial swelling and pain caused by the head and neck lymphedema. The head and neck lymphedema can be classified into the extrinsic lymphedema, intrinsic lymphedema, or a combination of both.[5] The extrinsic dental lymphedema may appear on the cheeks and neck, with the patients experiencing the local soft tissue inflammation, swelling or pain, which may affect chewing or the functional mobility of the jaw, head, and neck. In severe cases, it may even affect the patients' appearance and their self-confidence.[6] The intrinsic dental lymphedema is mainly the swelling of the alveolar and buccal soft tissues, which can also cause difficulty in chewing and the risk of aspiration of food stuffs or foreign bodies into the tracheobronchial tree.[7] The goal of physical therapy is to improve the patients' lymphedema and pain. Through evaluation and treatment, it can help the patients with head and neck lymphedema after dental surgery to improve their chewing difficulties, reduced jaw, head, and neck mobility, and other problems they face.

Currently, the wound care after dental surgery such as the tooth extraction mainly uses oral analgesics to relieve wound pain, antibiotics to inhibit infection, and the local ice compression to reduce local edema and swelling. For cheek swelling and bruising, the patients are recommended to apply ice compression within 48 h after surgery and heat compression after 72 h. Moreover, the manual lymphatic drainage is effective in reducing wound pain and cheek swelling after the wisdom tooth extraction by increasing lymphatic circulation.[1] In 1936, Dr. Emil Vodder of Denmark first introduced the manual lymphatic drainage method in Paris. With the subsequent development, it gradually became a widely used physical therapy method today.[8] Through steady pressure and rhythmic manual lymphatic drainage techniques, the activity of the sympathetic nervous system can be slowed down, achieving a relaxing and calming effect. At the same time, the manual lymphatic drainage using appropriate pressure can continuously stimulate the mechanoreceptors, causing the inhibitory synapses to transmit action potentials to offset the action

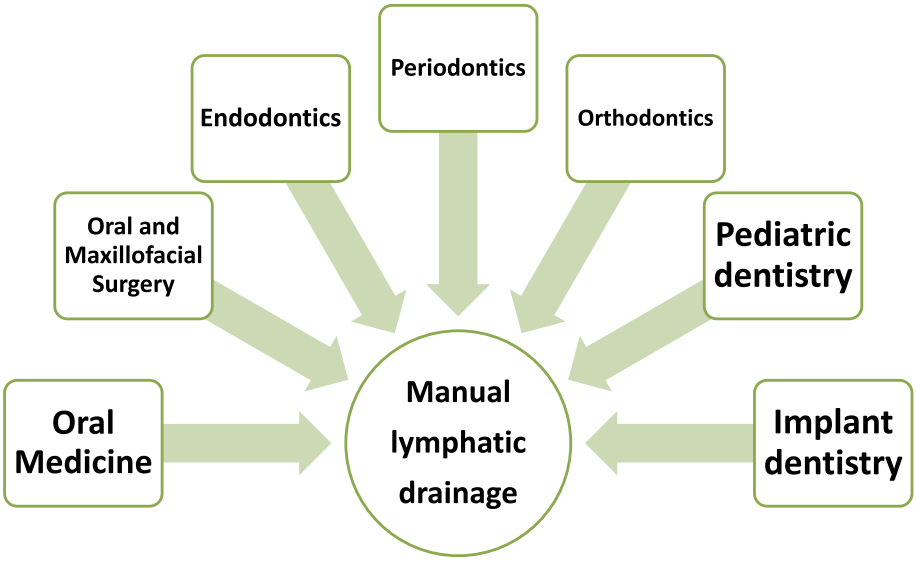

Figure 1 Potential uses and applications of the manual lymphatic drainage in dental patients receiving dental treatments or oral and maxillofacial surgeries.

potentials transmitted by the pain receptors. This is known as the gate control theory, achieving the effect of pain relief.[9]

The manual lymphatic drainage is different from lymphatic massage, which mainly operates on the muscles or fascia. The manual lymphatic drainage is a gentle technique that stimulates the skin through regular, steady pressure, thereby increasing the activity of lymphatic vessels and stimulating lymph nodes to increase the transport capacity of lymphatic vessels.[1] It drains the congested lymph fluid to the lymphatic vessels and lymph nodes with normal function, thereby improving the edema, relaxing the body, and relieving the pain.[8] Previous studies have shown that for the patients with extrinsic lymphedema after the wisdom tooth extraction, the use of the manual lymphatic drainage technique can effectively reduce the degree of edema and pain. Intraoral manual lymphatic drainage is effective in improving oral lymphedema such as the swelling of the tongue and palate.[1] Therefore, the manual lymphatic drainage has the potential for dental applications.

However, there are very few academic studies on the head and neck lymphedema, and there are also relatively few scholars who dedicate themselves to the research of the head and neck lymphedema. Currently, there are some studies focusing on the discussion of lymphedema in the patients receiving head and neck cancer surgery, but very few researches talk about the head and neck lymphedema caused by other factors such as trauma and non-cancer surgery. Most studies pay attention to the effects of lymphedema and how to measure it, but few focus on treating the intrinsic lymphedema. The measurement and evaluation of the head and neck lymphedema is still in the exploratory stage and there is no academic consensus. A unified and standardized measurement method has not yet been developed to objectively record the severity of the head and neck lymphedema. In clinical practice, the manual lymphatic drainage can be used as an auxiliary treatment for dental patients to relieve postoperative facial swelling and pain. The head and neck lymphedema is closely related to swallowing, breathing, chewing, vision, speech, and social interaction. Medical personnel performing the manual lymphatic drainage treatment should preferably receive the professional training. In the field of dentistry, more clinical interventions to improve the head and neck lymphedema can further improve the rehabilitation performance and life quality of the head and neck surgery patients.[10] For the dentists, the manual lymphatic drainage offers another option for their patients receiving oral and maxillofacial surgeries.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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