

# MANUAL LYMPHATIC DRAINAGE TECHNIQUES REDUCES POSTOPERATIVE FACIAL SWELLING AFTER THIRD MOLAR SURGERY

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## Summary

Manual lymphatic drainage (MLD) is a unique manual intervention pioneered by Emil and Estrid Vodder.

The **aim** of this study was to investigate whether the application of MLD, in case of surgically removal of impacted third molars, can efficiently diminish postoperative swelling.

**Material and methods:** Sixty patients with mandibular third molars, that required surgical removal, were divided into two equal groups: MLD group (30 patients) and control group (30 patients). Each patient underwent lower third molar extraction. MLD was performed on the neck region, using Vodder's method, once a day - immediately after extraction, until the suture removal. Swelling was evaluated prior to operation, on the first, third and seventh postoperative day with the objective method - a linear measurement. The six landmarks of measurement were as follows: tragus-lip junction, tragus-pogonion, mandibular angle-external corner of eye, mandibular angle-ala nasi, mandibular angle-lip junction, mandibular angle-median point of chin.

**Results:** All lines demonstrated a significant reduction of swelling in the MLD group compared to the control group.

**Conclusion:** MLD is an efficient method for managing postoperative swelling after the removal of impacted third mandibular molars.

Manual lymphatic drainage (MLD) techniques are unique manual therapy interventions pioneered by Emil and Estrid Vodder in the 1930s for the treatment of chronic sinusitis and immune disorders.<sup>1</sup> MLD improves lymph flow, microcirculation, tissue oxygenation, and reduces edema and pain.<sup>2</sup> Scientific studies show mixed results regarding the efficacy of the method in treating lymphedema.<sup>3</sup> The theoretical bases for using the therapy are founded on the following concepts<sup>4</sup>:

- 1) stimulating the lymphatic system via an increase in lymph circulation
- 2) expediting the removal of biochemical wastes from body tissues
- 3) enhancing body fluid dynamics, thereby facilitating edema reduction
- 4) decreasing sympathetic nervous system responses while increasing parasympathetic nervous tone yielding a non-stressed body-framework state

Surgical removal of impacted third molars can vary greatly in difficulty. Postoperatively patients develop pain and swelling associated with the surgical sites. Postoperative edema and pain can be minimized by a wide variety of local and systemic treatments. Local cooling with ice-packs, non-steroid anti-inflammatory drugs, corticosteroids, and antibiotics for prophylaxis or treatment are the most common methods.<sup>5</sup>

The **aim** of this study was to investigate whether the application of MLD, in case of surgically removal of impacted third molars, can efficiently diminish postoperative swelling.

**Material and methods:** Sixty patients with mandibular third molars that required surgical removal entered the study. All teeth were partially or completely covered by mucosa and

cortical bone. All patients were clinically healthy with no preoperative antibiotic treatment. The patients were divided into two equal groups decided by randomization: MLD group (30 patients) and control group (30 patients).

Each patient underwent lower third molar extraction with inferior alveolar nerve block with Ubistesin 1: 200 000 (Articaine hydrochloride 40 mg and adrenaline hydrochloride 0,006 mg). A full-thickness triangular mucoperiosteal flap was elevated from the mesial corner of the first molar distally to the retromolar region with vertical-releasing incision in the buccal fold. Osteotomy was performed using a round bur and a low-speed straight handpiece under constant irrigation of cool saline solution. Surgical sites were sutured (3-0 silk). Patients received 500 mg oral azithromycin once a day and 1000 mg methamizole sodium two times a day for three days.

At MLD group was carried out thirty minutes MLD on the neck region using Vodder's method<sup>2</sup> once a day - immediately after extraction until the suture removal. Evaluation of the therapy was scheduled to the seventh postoperative day, when sutures were completely removed.

Swelling was evaluated with the objective method<sup>6</sup> - a linear measurement, using a tape-measure graduated in millimeters, placed in contact with the skin. The six landmarks of measurement were as follows: tragus-lip junction, tragus-pogonion, mandibular angle-external corner of eye, mandibular angle-ala nasi, mandibular angle-lip junction, mandibular angle-median point of chin. The method of measurement was accomplished prior to operation, on the first, third and seventh postoperative day.

**Statistical Analysis:** The change between postsurgical conditions was calculated. A one-tailed paired t-test was used to

examine whether the mean change at the MLD-treated patients was significantly greater than the change in the control group.

**Results:** Male/female ratio was 1:1. Left/right tooth ratio was 1:1. The mean age was 36,4±1,6 years in MLD group and 29,7±1,3 years control group. Table 1 shows the results of measurement. All lines demonstrated a significant reduction of swelling on the MLD group compared to control group.

**Discussion:** In most cases, the removal of impacted third molars will lead to a significant degree of tissue trauma and the patient develops postoperative facial swelling. The facial swelling will reach its maximum 48 to 72 hours after surgery.<sup>7</sup> Postsurgical swelling is a major disadvantage and affects patient's life quality. To prescribe a medication such as corticosteroids<sup>8</sup>, nonsteroidal

anti-inflammatory drugs<sup>9</sup>, a combination of corticosteroids and nonsteroidal anti-inflammatory drugs<sup>7</sup>, or enzyme preparations such as serratiopeptidase<sup>10</sup> is a method to reduce swelling. In addition, nonmedication methods are available to decrease these side effects, including cryotherapy<sup>11</sup> and soft laser<sup>12</sup>.

Traumatic injuries alter lymph circulation, causing local edema. MLD increases transport capacity of lymph vessels and got a beneficial effect on the soft tissues after surgical removal of third mandibular molars. MLD leads to significant reduction in facial swelling and is a relatively safe method to treat complications after third molar surgery.

**Conclusion:** MLD is an efficient method for managing postoperative swelling after the removal of impacted third mandibular molars.

**Table 1**

Results of linear measurements in cm

Type of lines	Measurement in cm						
	Prior to surgery	24 hours after surgery		72 hours after surgery		The seventh postoperative day	
		MLD group	control group	MLD group	control group	MLD group	control group
Tragus-lip junction	9,39±0,34	9,53±0,13	10,23±0,11	9,67±0,57	11,2±0,42	9,43±0,83	10,1±0,23
Tragus-pogonion	9,67±0,24	9,89±0,37	10,65±0,45	9,99±0,65	11,3±0,18	9,73±0,63	9,89±0,75
Mandibular angle-external corner of the eye	8,2±0,42	8,3±0,21	8,9±0,35	8,5±0,19	9,0±0,34	8,2±0,89	8,4±0,47
Mandibular angle-ala nasi	10,3±0,57	10,4±0,36	10,9±0,56	10,6±0,23	11,5±0,25	10,3±0,65	10,5±0,34
Mandibular angle-lip junction	10,6±0,36	10,8±0,35	11,7±0,84	10,9±0,17	11,4±0,83	10,6±0,39	10,8±0,54
Mandibular angle-median point of chin	14,5±0,70	14,7±0,32	15,6±0,23	14,6±0,17	15,8±0,84	14,5±0,33	14,6±0,49

#### Bibliography:

1. Stillerman, Elaine (2009). *Modalities for Massage and Bodywork*. Mosby. p. 129-143. ISBN 032305255X
2. Foldi, M, S Kubik: *Textbook of Lymphology*. Urban & Fischer 2002. pp 532-537.
3. "Manual Lymph Drainage Combined With Compression Therapy for Arm Lymph- edema Following Breast Cancer Treatment". SBU.CE. 25 April 2014.
4. Korosec BJ. Manual lymphatic drainage therapy. *Home Health Care Mang Pract*. 2004;17:499-511.
5. F. Graziani, L. Corsi, M. Fornai, L. Antonioli, M. Tonelli, S.Cei et al: Clinical evaluation of piroxicam-FDDF and azithromycin in the prevention of complications associated with impacted lower third molar extraction. *Pharmacological Research* 52 (2005); 485-490.
6. Montebugnoli L, Servidio D, Miaton RA, Cuppini A, Baffioni R, Peronace V, et al: An objective method of assessing facial swelling in patients with dental abscesses treated with clarithromycin. *Min Stomatol* 53 (2004), 263-271.
7. Bamgbose BO, Akinwande JA, Adeyemo WL, et al: Effects of co-administered dexamethasone and diclofenac potassium on pain, swelling and trismus following third molar surgery. *Head Face Med* 1:11, 2005
8. Grossi GB, Maiorana C, Garramone RA, et al: Effect of submucosal injection of dexamethasone on postoperative discomfort after third molar surgery: A prospective study. *J Oral Maxillofac Surg* 65:2218, 2007
9. Benetello V, Sakamoto FC, Giglio FP, et al: The selective and non-selective cyclooxygenase inhibitors valdecoxib and piroxicam induce the same postoperative analgesia and control of trismus and swelling after lower third molar removal. *Braz J Med Biol Res* 40:1133, 2007
10. Al-Khateeb TH, Nusair Y: Effect of the proteolytic enzyme serrapeptase on swelling, pain and trismus after surgical extraction of mandibular third molars. *Int J Oral Maxillofac Surg* 37:264, 2008
11. Laureano-Filho JR, de Oliveira e Silva ED, Batista Cl, et al: The influence of cryotherapy on reduction of swelling, pain and trismus after third-molar extraction: A preliminary study. *J Am Dent Assoc* 136:774, 2005
12. Rønnesdal AK, Bjørnland T, Barkvold P, et al: The effect of soft-laser application on postoperative pain and swelling: A double-blind, crossover study. *Int J Oral Maxillofac Surg* 22: 242, 1993