Lymphologische Wintertagung

MLD – UNDE VENIS QUO VADIS?

Wie hat sich das Wissen um die MLD / KPE und deren praktische Anwendung seit den 80-er Jahren verändert?

How has the effect of MLD on lymphedema been demonstrated by imaging methods since the 1980s - how far does ICG help?

Franz-Josef Schingale

Manual Lymphdrainage

- In its basic features, lymphatic drainage was first used at the end of the 19th century by Alexander von Winiwarter and Johann von Esmarch. Vodder had developed an exact technique from this idea in the 1930s.
- In 1963, the German physician Johannes Asdonk became acquainted with manual lymphatic drainage by his future wife, Christa Bartetzko. Bartetzko was a beautician and at the time engaged in Asdonk's practice as a medical assistant. She had attended an ML course with Emil Vodder. Asdonk himself learned the moves of this gentle manual therapy, which had already been published by Vodder in 1936, but which had not yet found its way into conventional medicine, in 1964 at Vodder in Copenhagen.
- In 1967 the "Society for Manual Lymphatic Drainage according to Dr. Vodder " was founded among others by Emil Vodder, Johannes Asdonk and Günther Wittlinger.
- Thanks to the physicians Johannes Asdonk and Michael Földi the MLD was incorporated into conventional medicine.
- The first textbook of manual lymphatic drainage according to Dr. Vodder was written by Günther and Hildegard Wittlinger at the suggestion of Emil Vodder and published by Haug Verlag Heidelberg in 1978

MLD

- In the present day, manual lymph drainage (MLD), has become established as an integral part of lymphoedema treatment. However, the limited empirical evidence base and lack of consensus on the use and efficacy of MLD (Devoogdt et al, 2009) means there is a lack of clarity regarding the application of MLD for people with lymphoedema.
- The current drive towards cost effectiveness also means that bodywork treatments such as MLD may be given low priority in the planning and resourcing of services, this is why we need studies of the efficacy of MLD.

Evidence-based medicine (EBM)

- is an approach to medical practice intended to optimize decision-making by emphasizing the use of evidence from well-designed and well-conducted research.
- classifying evidence by its epistemologic strength and requiring that only the strongest types (coming from meta-analyses, systematic reviews, and randomized controlled trials) can yield strong recommendations; weaker types (such as from case-control studies) can yield only weak recommendations.

Levels of Evidence

Therapy/Prevention/Etiology/Harm:

1a:	Systematic reviews (with homogeneity) of randomized controlled trials
1b:	Individual randomized controlled trials (with narrow confidence interval)
1c:	All or none randomized controlled trials
2a:	Systematic reviews (with homogeneity) of cohort studies
2b:	Individual cohort study or low quality randomized controlled trials (e.g. <80% follow-up)
2c:	"Outcomes" Research; ecological studies
3a:	Systematic review (with homogeneity) of case-control studies
3b:	Individual case-control study
4:	Case-series (and poor quality cohort and case-control studies)
5:	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"

Centre for Evidence-Based Medicine, Oxford, 2009

- **For MLD only Level IIb is available**

J Man Manip Ther. 2009; 17(3): e80–e89.

Systematic Review of Efficacy for Manual Lymphatic Drainage Techniques in Sports Medicine and Rehabilitation: An Evidence-Based Practice Approach

Giampietro L Vairo, MS, ATC, ACI,[a,*] Sayers John Miller, PhD, PT, ATC,[b] Nicole M McBrier, PhD, ATC,[c] and William E Buckley, PhD, MBA, ATC[d]

Abstract

Manual therapists question integrating manual lymphatic drainage techniques (MLDTs) into conventional treatments for athletic injuries due to the scarcity of literature concerning musculoskeletal applications and established orthopaedic clinical practice guidelines. The purpose of this systematic review is to provide manual therapy clinicians with pertinent information regarding progression of MLDTs as well as to critique the evidence for efficacy of this method in sports medicine. We surveyed English-language publications from 1998 to 2008 by searching PubMed, PEDro, CINAHL, the Cochrane Library, and SPORTDiscus databases using the terms *lymphatic system*, *lymph drainage*, *lymphatic therapy*, *manual lymph drainage*, and *lymphatic pump techniques*. We selected articles investigating the effects of MLDTs on orthopaedic and athletic injury outcomes. Nine articles met inclusion criteria, of which 3 were randomized controlled trials (RCTs). We evaluated the 3 RCTs using a validity score (PEDro scale). Due to differences in experimental design, data could not be collapsed for meta-analysis. Animal model experiments reinforce theoretical principles for application of MLDTs. When combined with concomitant musculoskeletal therapy, pilot and case studies demonstrate MLDT effectiveness. The best evidence suggests that efficacy of MLDT in sports medicine and rehabilitation is specific to resolution of enzyme serum levels associated with acute skeletal muscle cell damage as well as reduction of edema following acute ankle joint sprain and radial wrist fracture. Currently, there is limited high-ranking evidence available. Well-designed RCTs assessing outcome variables following implementation of MLDTs in treating athletic injuries may provide conclusive evidence for establishing applicable clinical practice guidelines in sports medicine and rehabilitation.

Br J Community Nurs. 2010 Apr;15(4):S18-24.

Manual lymphatic drainage: exploring the history and evidence base.

Williams A[1].

Abstract

Manual lymph drainage (MLD) is an integral part of lymphoedema treatment but there is limited evidence to guide clinical practice. This paper outlines the historical background to MLD and provides insights into the evidence relating to the effect and efficacy of manual lymph drainage, highlighting considerations for lymphoedema practitioners.

Table 4. Evidence: examples of studies of the therapeutic effect of MLD in women with breast cancer-related lymphoedema

Authors	Design	Findings and comments
Johansson et al (1999) *Effects of compression bandaging with or without manual lymphatic drainage in patients with post-operative arm lymphoedema.* Setting: Sweden	Non-randomized consecutive sample of women with breast cancer-related lymphoedema. Part 1- women with limb volume excess of >10% received 2 weeks of CB Part 2 - divided into 2 groups • Group 1 had a further 1 week of CB/MLD (Vodder MLD method) • Group 2 had 1 week of CB alone	Data on 35 women showed: • At end of Part 1 - mean reduction in excess volume of 26% • At end of Part 2: o Group 1 (CB/MLD) had further 11% reduction in excess volume o Group 2 (CB) had further 4% reduction in excess volume • Both groups had improvement in symptoms but MLD group had a significant reduction in pain (p<0.03)
Andersen et al (2000) *Treatment of breast cancer-related lymphedema with or without manual lymphatic drainage. A randomized study.* Setting: Denmark	Prospective randomized study comparing standard treatment with custom-made information versus standard treatment and MLD (Vodder method) with 8 MLD treatments over 2 weeks, in women with limb volume of <30%	Data on 42 patients showed: • No evidence of treatment effect from MLD • Forty-eight percent reduction in absolute oedema volume at 3 months in MLD group • Sixty percent reduction in same in non-MLD group • No difference in symptom scores between groups • Complex method of calculating limb volume • Quality of life measured but data not reported
Sitzia et al (2002) *Manual lymphatic drainage (MLD) compared with simple lymphatic drainage (SLD) in the treatment of post-mastectomy lymphoedema. A pilot randomised trial* Setting: UK	Prospective study of 28 women with unilateral arm lymphoedema . Women randomized to two groups: Group 1- 2 weeks CB/MLD (Leduc method) given by therapist Group 2- 2 weeks CB/SLD (a simple form of MLD) given by therapist	Data from 28 women showed: • Group 1- 33.8% reduction in excess limb volume • Group 2- 22% reduction in excess limb volume • Initial excess volumes of 68.3% in Group 1 and 58.5% in Group 2 • Small pilot study suggested that MLD was more effective than SLD but neither results were significant and larger sample of 56 participants required to achieve significance
Williams et al (2002) *A randomised controlled crossover study of manual lymph drainage (MLD) therapy in women with breast cancer-related lymphoedema.* Setting: UK	Prospective cross-over study of 31 women with limb volume excess of >10% (mean 35% excess) Women randomized to two groups: Group A: 3 weeks (15 treatments) MLD (Vodder method) combined with standard treatment of compression hosiery and information Group B: 3 weeks of daily patient self-administered massage combined with standard treatment with compression hosiery and information. 'Wash-out' period of 6 weeks then participants crossed over to: Group A: 3 weeks SLD and compression hosiery Group B: 3 weeks MLD and compression hosiery Measurement of change in excess limb volume, dermal depth using skin ulstrasound, caliper 'creep' to assess trunk oedema and quality of life (EORTC QLQ C30)	Data from 31 women showed: • MLD achieved a significant reduction in excess volume (p=0.013) • MLD achieved a significant reduction in dermal depth in the upper arm (p=0.03) • MLD achieved a statistically significant improvement in emotional function, dyspnoea, sleep disturbance and pain sensation • Self-administered massage had no statistically significant effects • MLD was used without CB in an attempt to isolate the effect of MLD • Longer than 3 weeks is required to evaluate self-massage • Outcome measures such as caliper creep and skin ultrasound need further validation
McNeeley et al (2004) *The addition of manual lymph drainage to compression therapy for breast cancer-related lymphedema: a randomized controlled trial* Setting: USA	Sample of 50 women who had lymphoedema after breast cancer randomized to 4 weeks of daily treatment with MLD (Vodder method) and compression bandaging (CB) or CB alone. Measurement of limb volume reduction expressed as percentage change in excess limb volume	Data on 45 women showed: • Significant reduction in lymphoedema volume in both groups (CB and MLD/CB) with most benefit seen in the initial 2 weeks • Statistically significant greater limb volume reduction with MLD/CB in those with early lymphoedema (p < 0.05) • Better outcome with MLD/CB in those with mild lymphoedema (<15% excess volume) than in any other groups (p < 0.05) • Range of movement and other aspects of quality of life or symptoms not assessed

Br J Community Nurs. 2010 Apr;15(4):S18-24.

Manual lymphatic drainage: exploring the history and evidence base.

Williams A[1].

Manual lymphatic drainage / complex decongestive therapy: evidence on the treatment and prevention of primary and secondary lymphoedema

Projectteam

- PD Dr. Karl Horvath
- Dr. Klaus Jeitler
- Dr. Nicole Posch
- Mag. Thomas Semlitsch

Institut für Allgemeinmedizin und
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Medizinische Universität Graz März 2015

By means of research in medical literature databases (MEDLINE®, 4 Cochrane databases) 3 relevant high-quality systematic reviews and 5 RCTs could be identified.

In all 8 included publications, the results were related to manual lymphatic drainage alone or as part of a combined therapy to the indication of secondary lymphedema after breast cancer surgery. For other secondary as well as for the primary lymphoedema no RCTs or high-quality systematic reviews could be identified for the period from 2006 onwards.

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- For MLD over a period of max. 6 weeks on the basis of the 3 systematic reviews and 2 additional current RCTs, however, **there was no indication for an additional clinically relevant effect compared to the standard therapy** used (usually compression therapy with stockings or bandages). However, the reliability of this statement is low due to the high risk of bias of the included studies.

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Medizinische Universität Graz März 2015

- No other RCTs or high-quality systematic reviews could be identified for the period from 2006 onwards for other secondary lymphoedema other than "breast cancer-associated lymphedema" and for primary lymphedema. **Due to the lack of any evidence, therefore, no statement is currently available on the efficacy of MLD in these indications.**

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What has happened in the EBM to the MLD since 1980? Evidence of efficacy

- **1. Perometermeasurement**

  opto-electronic method for determining the circumference and volume calculation

- **2. BIO-Impedanz-Analyse**

  electrical resistance measurement to calculate the fluid content of individual limbs, high error rate

- **3. Sonography**

  Detection of fluid gaps, skin thickness and compressibility

- **4. Lymphszintigraphy**

  radiological examination by radioactive labeled protein with measurement of the effluent under MLD

- **5. ICG-Fluoroscopy**

  Indocyanine green dye with near infrared detection. In the meantime, there are calculation programs with which not only the qualitative but also the quantitative outflow can be calculated.

Problems

- With methods 1-3, falsified results can also be produced by elevation of the extremity alone. An effect of MLD can not be proven without doubt.
- The lymphoscintigraphic examination is very time consuming and expensive, so this method is out of the question for randomized controlled trials.
- With the ICG method, the effect of MLD can be demonstrated. With appropriate computer programs, the transported amount of edema volume can be detected. So far, however, still in the experimental stage, since in the meantime, new methods of MLD such as "flush-and-fill" by J.B. Belgrado apparently demonstrated a better technique for lymphatic transport.
- This creates a new dichotomy: first, a certainty in the effectiveness of the different lymphatic drainage technique must be presented in order to initiate randomized controlled trials. The method is easy to perform and at no significant cost after the camera has been purchased.
- **Another problem so far**:
- the ICG dye is still out-of-label for use in the interstitial tissue, that is why broad-based RCTs are not yet possible

LYMPHO-FLUOROSCOPY
AN EMERGING TOOL LEADING US TO EVIDENCE BASED MANUAL LYMPHATIC DRAINAGE.

Belgrado JP, Vandermeeren L, Valsamis JB, Vankerckhove S, Sinègre A, Moraine JJ, Deraemaecker R

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Near infrared fluoroscopy (NIRF) is an emerging imaging tool in the field of lymphology. The intradermal injection of diluted Indocyanine green (ICG) coupled with a dedicated camera (PDE®) allows to visualize the superficial lymphatic network architecture and lymphangion's activity in real-time.

With NIRF we are able to realize a mapping of functional lymphatic collectors, dermal rerouting areas, dermal backflow areas and functional substitution pathways.

This valuable information could contribute **to monitor the treatment of lymphedema,** showing the therapist where to place his hands. Moreover, NIRF might lead manual therapists to improve their hand's movements because it offers the opportunity **to evaluate MLD methods** with a real-time feedback.

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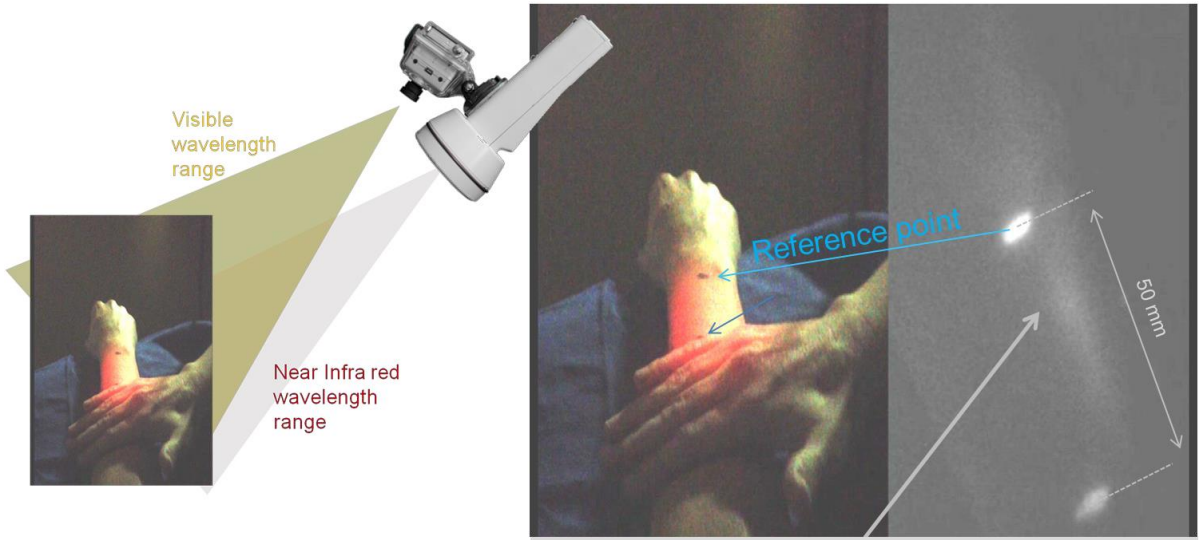


Superficial lymphatic observed and video recorded applying various MLD technique. The lymphatic is located between two reference points d=50 mm

J.P.Belgrado

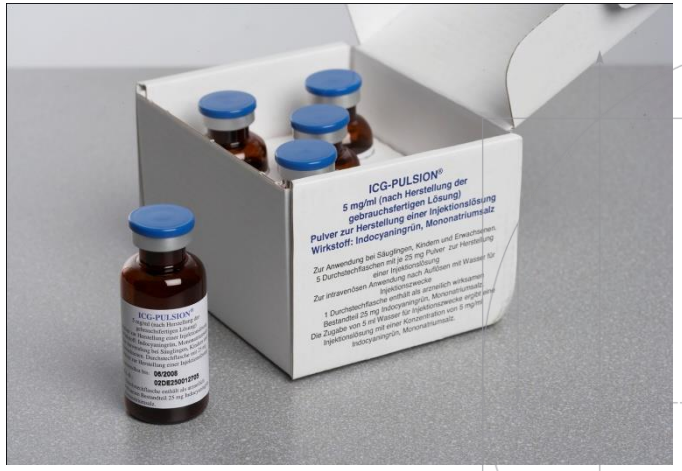
That is why we started to explore more deeply **various MLD techniques** coupling the PDE® Camera to a Gopro™ camera, that helped us to widen the spectrum of vision from the field of fluoroscopy to the larger environment including the therapists hand in motion.

The videos allowed us firstly to analyze "usual" lymphatic drainage methods, and subsequently to optimize them, in order to propose a **"new" MLD technique** based on evidence. Under the light of NIRF we have tested our new drainage method. We could observe that the new technique is more efficient to improve the transfer of fluid from the interstitium into the lymphatic network (fill up) and to increase lymph propagation (flush) as well.

Our own results

- The function of lymph vessels is different in different individuals:
- In healthy volunteers:
  - Sometimes there is a spontaneous flow
  - Sometimes you have just to press a bit and then the flow starts

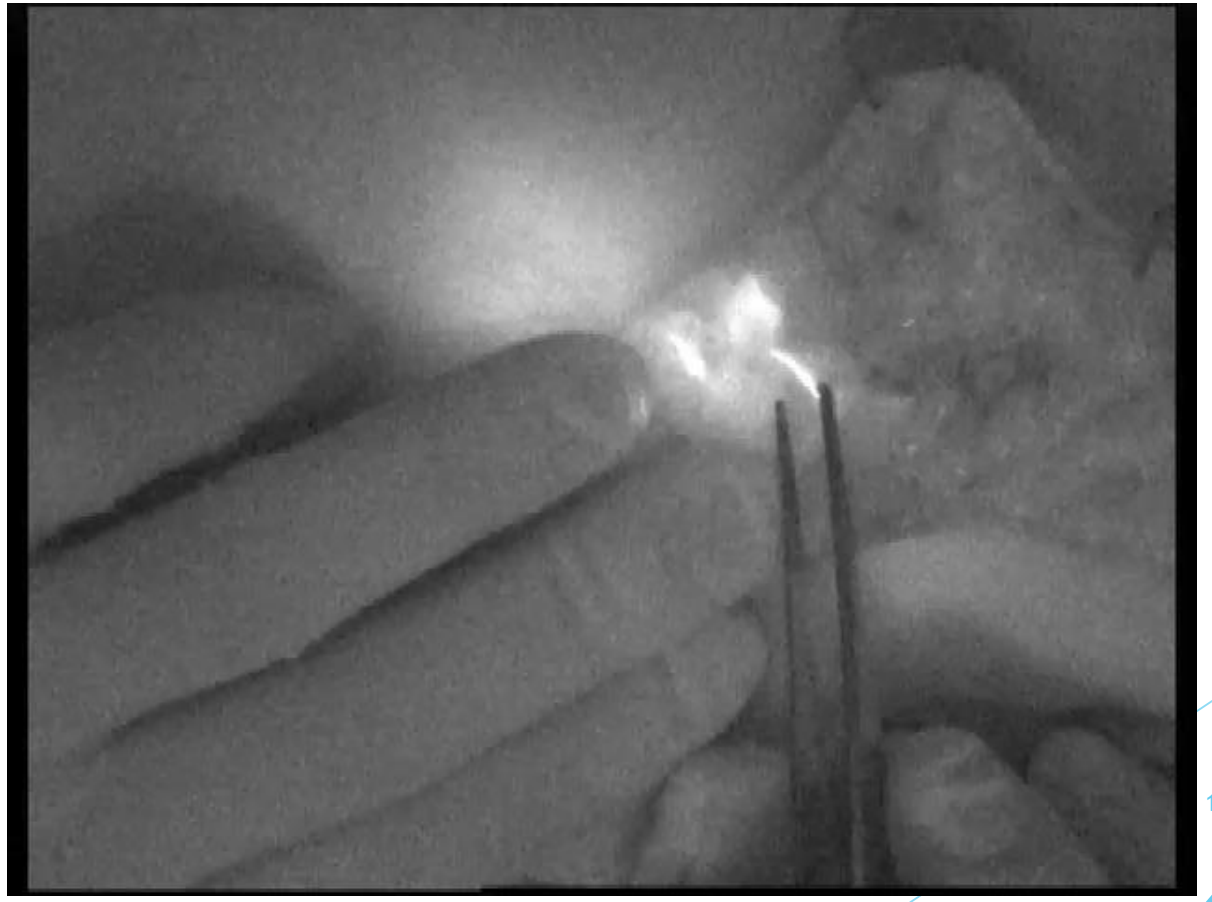
IC-Flow



ICG - Fluorescence lymphoscopy

Clinical application: lymphvessel transplantation

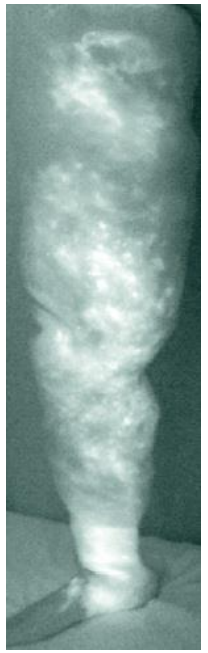
LV can be detected and be tested for patency



Clinical application: Lymphangioscopy

native

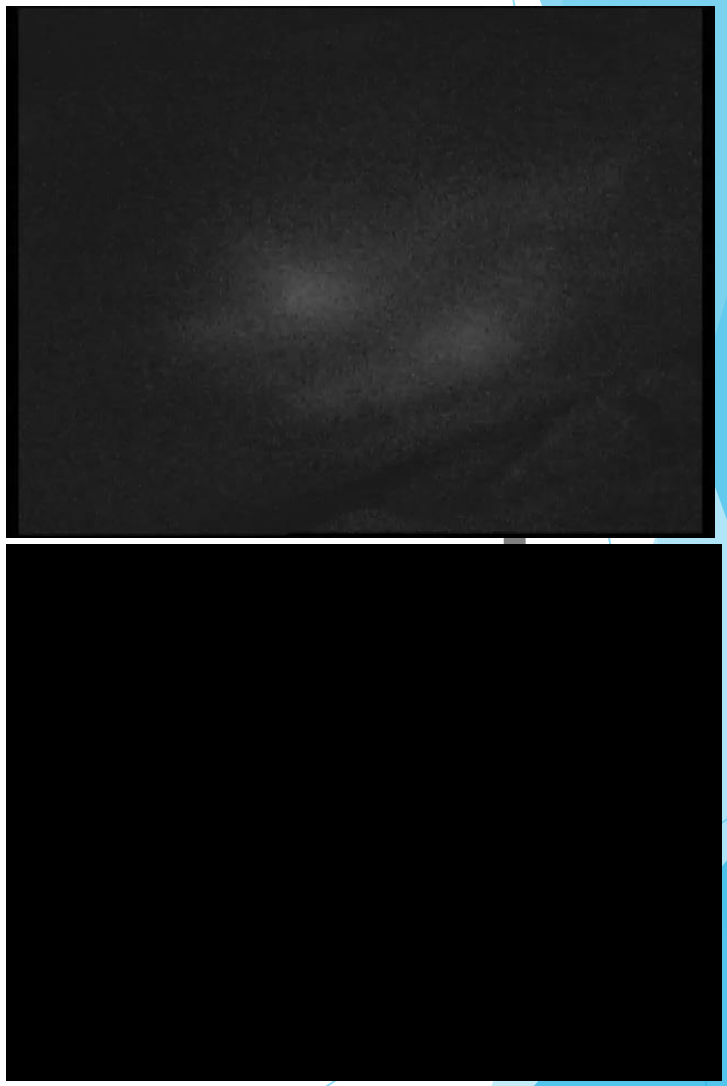
mit IC-Flow



flow can be used in superficial examinations of LV

Clinical application: effectiveness of treatment

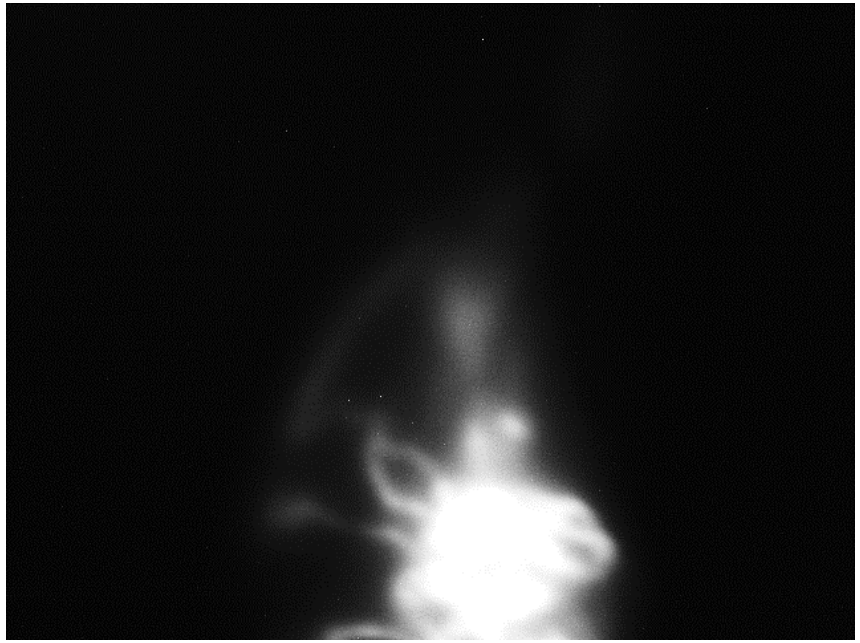
native



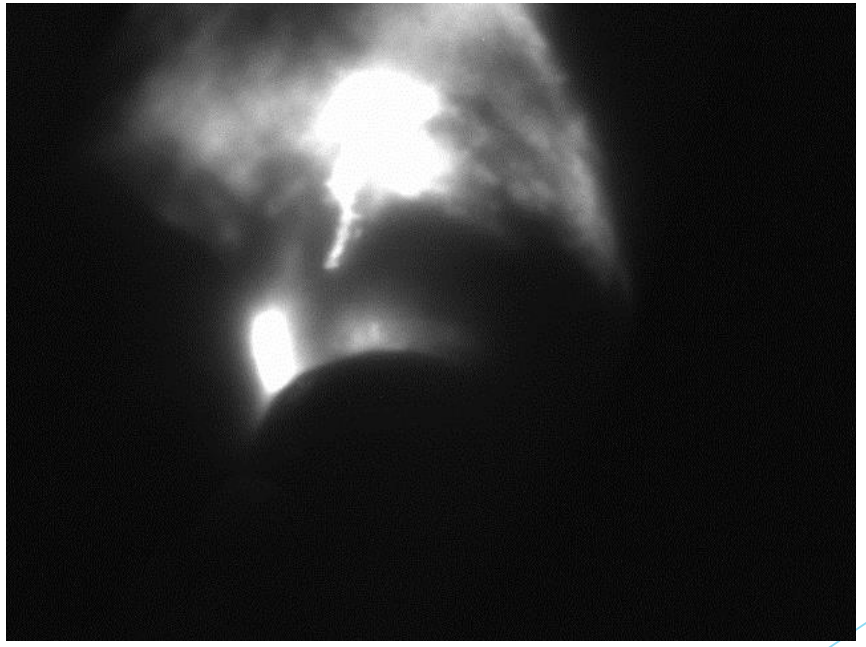
ICG Flow can show efficacy of different treatment methods

Uncertain findings

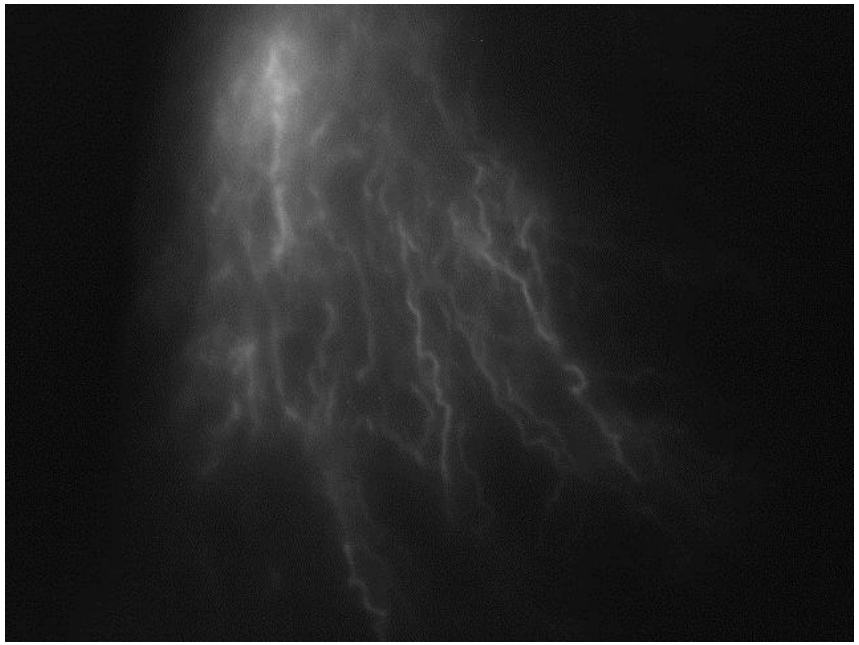
Direct after injection



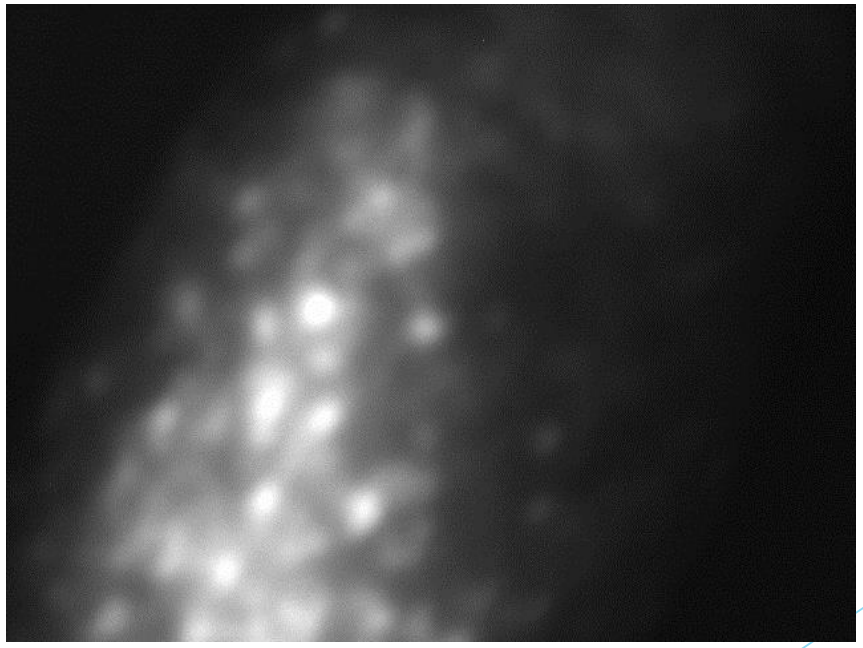
2 hours later



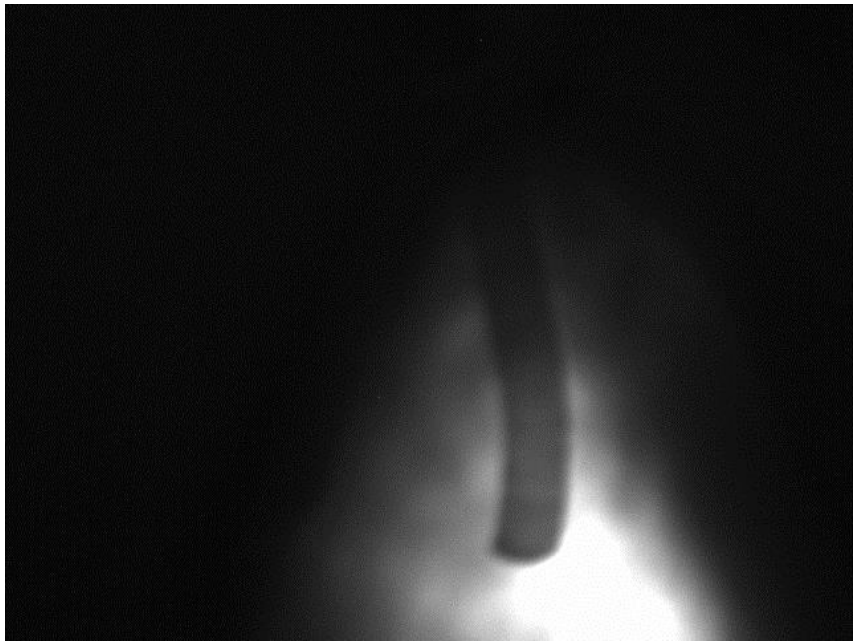
Direct after injection

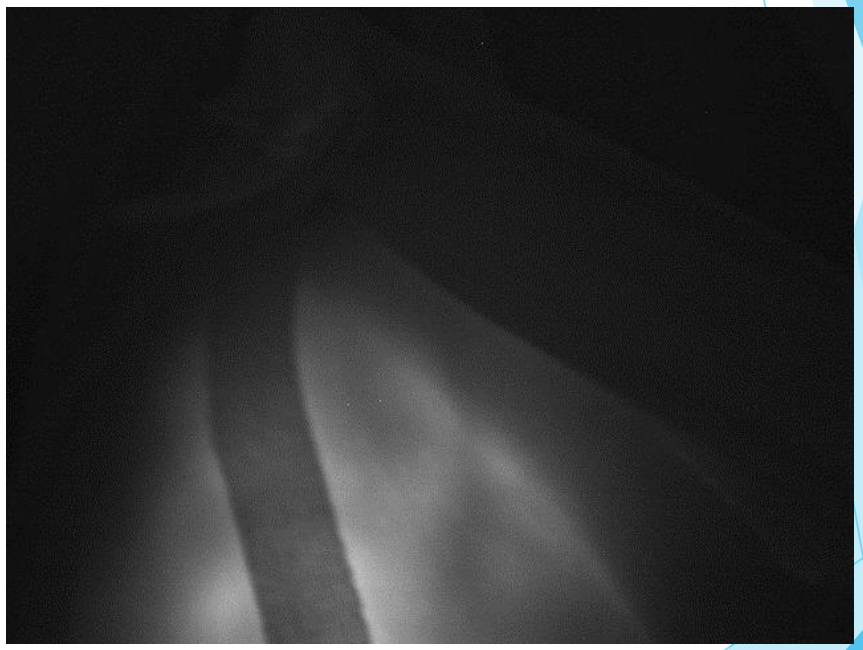


2 hours after injection

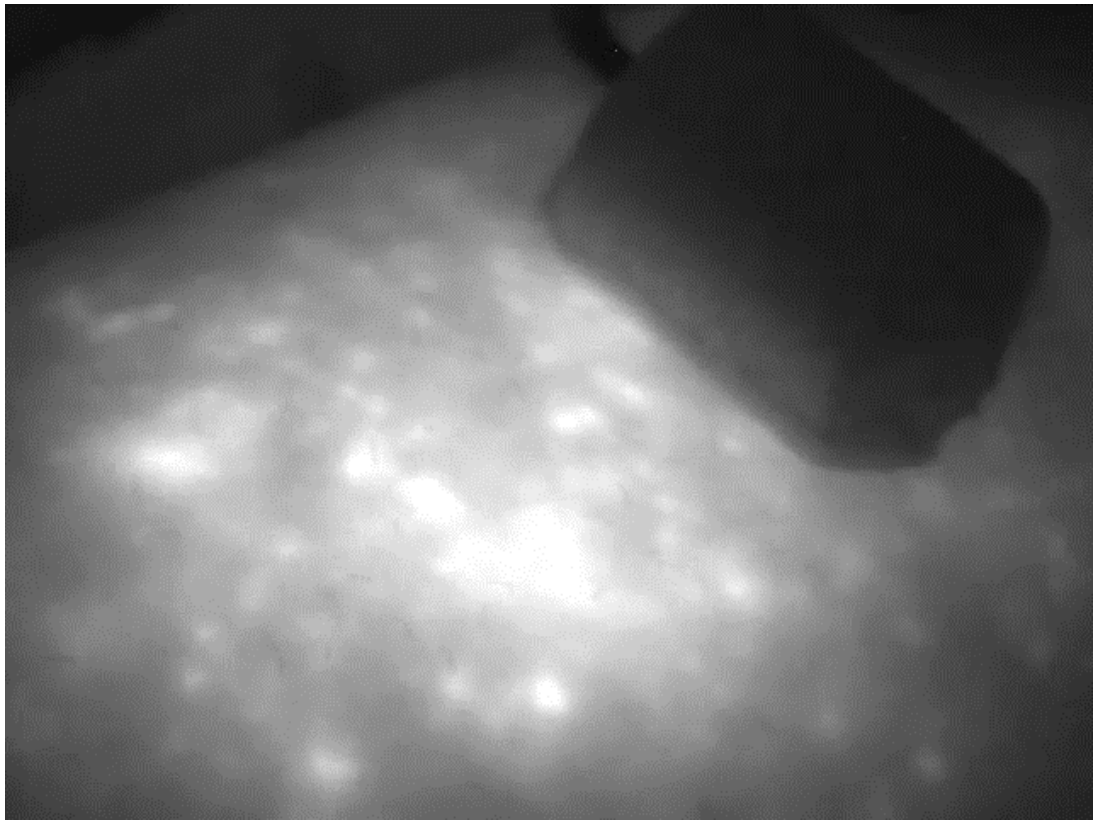


lymphflow with tape





Linfaroll



Optimizing of therapy

Conclusion

The **ICG Fluoroscopy** is a revolutionary technique in lymphology with a variety of uses:

- Sentinel - search
- Showing the superficial LV
- Function of LV
- Treatment ways
- Testing of different treatment methods
- Evicence base medicine

But----.

ICG is still „out of label“- use

„Before the injection of ICG-PULSION starts, you should be sure that the needle has been properly inserted into the vein. If the drug infiltrates the surrounding tissue, the injection has to be interrupted immidiatly..“

So RCTs still have to wait

Thank you for your attention