

Treatment of Lymphangioma

Burns Orthopedic
Department

Sclerotherapy

- Sclerotherapy is effective in treating and resolving macrocystic LMs, with much less efficacy in microcystic LMs

Ann M. Defnet, et al. Pediatr Surg Int (2016)

- Entering the cystic cavity with a direct puncture under radiographic guidance, aspirating the cystic fluid, and finally injecting the sclerosant

Manning SC, et al. Curr Opin Otolaryngol Head Neck Surg(2013)

Sclerosant	Description	Proposed mechanism of action	Use	Complications
<i>Picibanil (OK-432)</i>	Lyophilized mixture: Group A Streptococcus pyogenes Benzylpenicillin	Inflammatory response resulting in cytokine production by leukocytes	Macrocystic LMs	Anaphylaxis
<i>Doxycycline</i>	Tetracycline antibiotic	Inhibits matrix metalloproteinases and cell proliferation Suppresses VEGF-induced angiogenesis and lymphangiogenesis Deposition of collagen and fibrin with involution of cyst	Macrocystic LMs	Tooth discoloration Electrolyte abnormalities
<i>Bleomycin</i>	Chemotherapeutic agent	Inhibits DNA synthesis Causes inflammatory reaction on endothelial cells	Macrocystic LMs	Interstitial pneumonia Pulmonary fibrosis (With IV administration of cumulative doses greater than 400 mg)
<i>Pingyangmycin</i>	Chemotherapeutic agent	Selective destruction of lymphatic endothelial cells lining cyst Increased collagen deposition in cyst cavity	Macrocystic LMs Microcystic LMs	Hair loss Gastrointestinal reaction Skin pigmentation change Pulmonary fibrosis
<i>Ethanol</i>	Desiccant	Rapid cellular dehydration of lymphatic endothelial cells	Macrocystic LMs (infrequently)	Respiratory depression Cardiac arrhythmias Rhabdomyolysis hypoglycemia seizures
<i>Sodium tetradecyl sulfate (STS)</i>	Detergent	Emulsify cell membrane lipoproteins Increase membrane permeability Enhance cell death and fibrosis when used in combination with doxycycline or ethanol	Macrocystic LMs Orbital LMs	Increased risk of infection

Ablation

- Radiofrequency ablation (RFA) for reducing mucosal lymphangiomatous lesions, especially **microcystic LMs**
- High frequency mode:
 - Destruction of deep tissue without affecting adjoining structures or mucosa.
 - Lesional size is diminished due to subsequent fibrosis.
- Low-frequency mode
 - Energy to be transmitted through a conductive medium, such as isotonic saline, for removal of a thin superficial layer with minimal injury to nearby tissue

Berg EE, et al(2013) Ann Otol Rhinol Laryngol.

Kim SW, et al (2011) Arch Otolaryngol Head Neck Surg

Laser

- For **Microcystic lesions**, Remove mucosal microvesicles
- Carbon dioxide lasers
- Pulsed dye lasers

(Haas AF; Narurkar VA-[Dermatol Surg. 1998; 24\(8\):893-5](#))

MEDICATION

- Sildenafil

- Decrease LM size and alleviate associated symptoms, in case report

Swetman GL, et al (2012) N Engl J Med

- Propranolol

(Ozeki M; Fukao T; Kondo N [N Engl J Med. 2011; 364\(14\):1380-2](#))

THANK YOU