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# PDL & infection

Wart

cutaneous leishmaniasis

Molluscum contagiosum



# wart



# Selection of treatment

Cost

type of lesion

patient's preference

status of immune system

previous treatment modalities



# Treatment modalities

destructive methods

Virocidal

Antiproliferative

immunological therapies



# Mechanism

vascular thrombosis in the dermal papillary vessels

destruction and necrosis of infected keratinocytes

Destruction of blood vessel → release of inflammatory cytokines

enhances a cellular immune system response



# Treatment efficacy and recurrence rates

In different studies, **complete response** rate was between 0% and 100%.

**Recurrence rate** was between 0% and 30% to 40%.

Patients were **followed** from 1 to 66 months.





# Device settings

fluence : (6-20 J/cm<sup>2</sup>)

pulse duration : [38 ns (ns) – 6 milliseconds (ms)]

spot size : 5 or 7 mm in adults, 2-7 mm in the pediatric group

overlapping of pulses : 1-2 mm

number of pulses : 1-5



Interval : 1-6 w

Number of session : 1-44

Margin : 1-5

Overlap : 1-2 mm

CR : 45-100 percent

RR : 0-40 percent



# Endpoints of treatments

grayish color of the tissue

pinpoint bleeding

intense purpura

minimal erythema



# clearance rate

Plane wart lesions : higher response rates

verruca plantaris : lower response rates



# treatment interval

better efficacy : treatment interval of 4 weeks or shorter



# Combination therapy

**combination of PDL** (Spot size, 7 mm; 10 J/cm<sup>2</sup> ; 3-4 pulses),  
**intralesional bleomycin** (0.5 U/cc; 0.1-0.5 cc/lesion) and paring of  
hyperkeratotic skin on recalcitrant hand wart lesions in  
immunosuppressive patients.



# Combination therapy

complete response rate of 60% with combination of PDL (spot size, 7 mm; 12-15 J/cm<sup>2</sup> ; pulse duration, 1.5 ms; 3 pulses) and intralesional bleomycin (1 mg/cc normal saline) for refractory hand and foot warts.



# Combination therapy

complete response rate of 92.3% with **combination of PDL** (spot size, 5-7 mm; 8 J/cm<sup>2</sup> ; pulse duration, 450  $\mu$ s; 2 pulses), **intralesional IFN- $\alpha$ 2b** and paring of hyperkeratotic skin for refractory periungual lesions.





## PDL + 30% SA vs PDL

significantly **better response rate** in combination therapy **with PDL + 30% SA vs PDL** (spot size 5; 6-9 J/cm<sup>2</sup> ; pulse duration, 350 µs; 3 pulses) after second session of treatment, but **at the end of treatment the difference between the 2 groups was not significant** (69.7% and 66.6% for combination therapy and monotherapy, respectively).



# PDL + PDT

higher complete remission rate (100%) with lower mean number of sessions in **PDL + PDT** compared to PDL (81%) alone



# Comparison with other therapies

Robson et al compared efficacy of PDL (spot size, 5 mm; 9.0-9.5 J/cm<sup>2</sup> ; 2 pulses) with conventional therapies (cryotherapy, cantharidin).

Complete remission of **70%** with a mean of 2.06 sessions and **66%** with a mean of 2.00 sessions was achieved using **conventional therapy** and **PDL**, respectively; the difference, though, was not significant between the 2 treatment groups.



side effects including **blister formation and pain** were significantly **higher with cryotherapy** (51.4% and 70.3%) compared to PDL (8.9% and 35.6%), respectively



# PDL vs Nd:YAG

no significant difference regarding complete response rate and recurrent rate

**Nd :YAG group needed less treatment sessions** for achieving complete clearance.



**Side effects were significantly higher in Nd: YAG group** than in PDL group.

# Side effects

Pain

hemorrhage

crust formation

blister

Hypopigmentation

hyperpigmentation

hematoma

secondary bacterial infection

persistent erythema,

hypertrophic or atrophic scar formation,

pruritus after laser, collapse, superficial ulceration

grayish-black color of the lesion (improved after 1 week)

Crust : disappeared after 2 weeks, but longer times of remission up to 8 weeks were also reported.



# ablative lasers

**ablative lasers** (CO 2 and Er: YAG) required **lower number of treatment sessions** to achieve clearance compared to non-ablative lasers (PDL and Nd: YAG).



Between non-ablative lasers, **Nd: YAG laser** usually required **lower number of sessions for remission** than PDL.

# Nd: YAG vs PDL

response rate was not remarkably different between Nd: YAG and PDL

Nd: YAG had better response rate, especially on deep plantar wart



Nd: YAG laser might be recommended as a first-line treatment for recalcitrant plantar wart lesions



Combination of **PDT and PDL** also leads to higher response rates with lower number of sessions and lower recurrence rates because of the effect of **PDT on clearing subclinical lesions**.



A higher risk of adverse effects was observed more frequently  
with Nd: YAG laser and ablative lasers compared to PDL



regarding safety issue **PDL seems to be a better choice** among different types of lasers.

On the other hand, **Nd: YAG has a longer wavelength** and lower absorption by melanin pigment relative to PDL, thus, especially in **darker skin types it can be a favorable option.**



Combination of lasers with mechanical or **topical keratolytic methods** is **recommended before laser therapy** for accelerated remission.

Furthermore, **combination of lasers with immunomodulators** can be helpful, especially in refractory lesions (especially periungual warts), immunosuppressed patients and genital warts.



# Molluscum contagiosum



# advantages

Safe

Well tolerated

Quick

Highly effective



# endpoint

Single or double pulse to each lesion

Or

Applied pulses until the lesion became purpuric



# setting

fluence : 2-10 J/cm<sup>2</sup>

WL : 595nm

pulse duration : 0.25- 0.45msec

spot size : 3-7

Interval : 2-3w

Number of session : 1-3

CR : 100 percent

RR : 0

F/U : 6-10 m





# molluscum contagiosum & HIV

Safe & effective

Without bleeding

No open wound

Less risk of secondary infection



# molluscum contagiosum & children

Well tolerated

painful Minimally

Treat of large number of lesions in a short period of time



# Adverse Events

Transient post-operative purpura

Transient skin pigment change



# Leishmaniasis



# mechanism

Unknown

heat generation

Stimulation of immune system

inflammatory reaction /cytokine change.

vascular pattern in leishmaniasis / vascular efficacy injury selective photothermolysis



# Leishmaniasis

erythematous

Texture

Pliability

scar size



# Setting

fluence : 7-8 J/cm<sup>2</sup>

WL : 595nm

pulse duration : 0.45msec

spot size : 10mm

number of pulses : 1-2

Interval : 2-3w

Number of session :1-4

CR : 100 percent



# glucantime vs PDL

The scar of PDL was slightly less in the laser group.

more superficial lesions responded better to the PDL therapy .





# THANK YOU FOR YOUR ATTENTION



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