Chemotherapy-Associated Paronychia Treated With 2% Povidone-Iodine: A Series of Cases

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BACKGROUND

The taxanes and Epidermal Growth Factor Receptor Inhibitors (EGFRIs) are classes of drugs well known to cause chemotherapy-associated paronychia (CAP).

With CAP, a primary inflammatory reaction first develops and physically disrupts the nail apparatus, which then often becomes secondarily infected or colonized.

CAP presents with numerous physical findings including erythema, edema, purulent or serosanguinous discharge, onycholysis (**Figure 1**), subungual and/or periungual granulation tissue (**Figure 2**).

Management strategies:

- Minimizing periungual trauma
- Decreasing periungual inflammation
- Preventing secondary infection
- Eliminating excessive granulation tissue
- Topical anti-inflammatory agents
- Topical or oral antibiotic/antimycotic agents to treat secondary infection
- Electrocautery, silver nitrate, nail avulsion and surgical I&D

There is no standard of care for treatment, dose modification or drug discontinuation may result.

METHODS

Povidone-iodine (PVP-I):

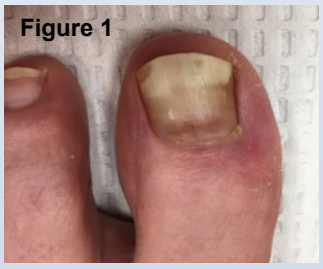
- Aqueous solution is a well-known, nontoxic and commonly used topical broad spectrum anti-microbial
- Bacteria, yeast, fungi, protozoa, molds, viruses
- Resistance-free/ MOA non-specific
- Polyvinylpyrrolidone (PVP) and Triiodide (I^{3-}) in aqueous formulation
- Aqueous solution system creates molecular Iodine (I_2)
- Free I_2 is the active anti-microbial
- Unique chemistry- lower concentration more effective
  - PVP unwraps in more dilute solutions
  - More I_2 becomes available

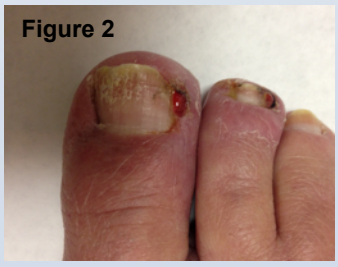
Dimethylsulfoxide (DMSO):

- Polar, aprotic, non-toxic solvent
- Can dissolve enormous library of molecules
- Transdermal deliver system
- Known for its penetration enhancing ability when applied to the skin
- Safe and well tolerated

A proprietary 2% (w/w) PVP-I in DMSO solution was developed and filled via a compounding pharmacy.

Nine patients referred from oncology with CAP were treated for up to 6 weeks with twice-a-day application of the nail solution and instructed to apply to the nail plate, periungual and subungual spaces. Patients returned to the office at 3 week intervals.





RESULTS

All 9/9 patients demonstrated complete or partial resolution (**Table 1**).

There were a total of 58 nails affected in the case series and 44/58 (76%) resolved overall.

Complete resolution occurred in 3/9 (33%) patients and partial resolution occurred in 6/9 (66%) of patients.

All 9/9 patients reported reduction in pain within one week.

Mild skin irritation and dryness were the only reported adverse effects.

Table 1

Pt	M/F	Chemo	Location	CTCAE Grade	# Digits	Duration	3 Weeks # nails Resolved	6 weeks # nails Resolved	Culture Results
1	M	cetuximab	Feet	2	4	3 weeks	4/4	N/A	*S. aureus*
2	M	docetaxel	Hands	2	7	6 weeks	3/7	5/7*	*S. aureus*
3	F	docetaxel	Hands/ Feet	3	12	6 weeks	5/12	8/12*	*S. aureus*
4	F	cetuximab	Feet	2	5	3 weeks	5/5	N/A	*P. aeruginosa*
5	M	docetaxel	Hands	2	6	6 weeks	1/6	4/6*	*P. aeruginosa, T. mentagrophytes*
6	F	panitumumab	Feet	2	5	6 weeks	3/5	4/5	*S. aureus, T. mentagrophytes*
7	F	cetuximab	Hands	2	8	6 weeks	3/8	5/8	*S. pyogenes*
8	F	erlotinib	Feet	2	3	3 weeks	3/3	N/A	*T. mentagrophytes*
9	M	docetaxel	Hands	3	8	6 weeks	4/8	6/8*	*S. pyogenes*

CONCLUSIONS

Taxanes and EGFRIs are associated with significant nail toxicities, commonly presenting as recalcitrant paronychia.

There is currently no standard of care treatment.

Severe cases cause limitation of daily activities requiring chemotherapy interruptions.

Preliminary results suggest that our novel 2% PVP-I / DMSO nail solution may be an effective topical treatment for CAP.

Phase IIb clinical trial to start Q3/Q4 2017.

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