Topline Results of a Phase III Trial for Common Warts: Efficacy, Safety, and Systemic Response of Intralesional *Candida albicans* Antigen

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Abstract

Background: Purified *Candida albicans* antigen (PCA) is an immunotherapy hypothesized to stimulate a systemic immune response against HPV, the viral driver of common warts. **Methods:** In this Phase III trial (*N* = 352), participants received up to 10 intralesional injections of PCA or saline into a single lesion. **Results:** PCA demonstrated superior, durable (12 weeks post-final injection) clearance of treated (**45.4%** vs. **23.4%**; $p<0.001$) and distal (**27.6%** vs. **16.0%**; $p=0.023$) warts. Over 60% of PCA responders achieved durable clearance within 4 injections; most showed resolution of both treated and untreated warts. **Safety:** PCA was well-tolerated with no treatment-related SAEs. **Conclusion**: This trial demonstrates the clinical utility of PCA as a non-destructive immunotherapy for warts. Results show rapid resolution and sustained clearance; distal resolution is consistent with a systemic immunotherapeutic effect, providing a well-tolerated, potent, single-site alternative to traditional destructive multi-lesion destructive therapies.

Introduction

Clinical Problem: Common warts (*Verruca vulgaris*) are caused by HPV and persist via immune evasion, often leading to recalcitrant or widespread lesions.

Limitations of Current Therapy: Standard destructive treatment modalities (e.g., cryotherapy) target physical lesions but are associated with significant pain and skin discoloration. Critically, they fail to address the underlying viral infection or untreated distal warts, and high recurrence remains a significant limitation.

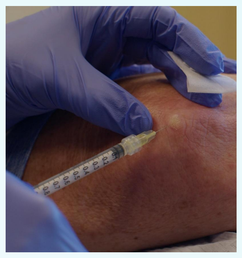


Figure 1. Intralesional administration of PCA.

Hypothesized Mechanism: Intralesional immunotherapy with PCA is hypothesized to stimulate a cell-mediated immune response via single-site injection, which may result in effective and durable wart resolution.

Study Objective: This Phase III trial evaluated the efficacy and safety of a defined-potency PCA (Candin®) as a non-destructive, single-site alternative for localized and distal wart resolution.

Methodology

Study Design: A Phase III, multinational, randomized, double-blind, placebo-controlled trial.

Participants: 352 participants from the US or Japan (aged ≥ 12 years) presenting with 3-20 common warts.

Randomization: Participants were randomized in a 2:1 ratio to receive either PCA or a saline placebo.

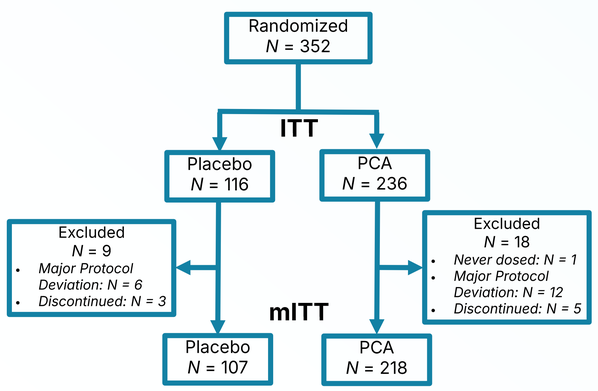
Dosing and Administration: Up to 10 intralesional injections (0.5 mL) administered every 2 weeks into a **single treatment wart**.

Analysis Population: The primary and secondary endpoint analyses were conducted on the mITT population (*N* = 325).

Primary Endpoint: Complete resolution of the treated wart, with no recurrence through 12 weeks post-final injection.

Secondary Endpoints: Complete resolution of all non-injected measured warts and the number of injections required to achieve clearance.

Trial Registration: NCT05889845.



Abbreviations: CI = confidence interval; CMH = Cochran-Mantel-Haenszel; HR = hazard ratio; ITT = Intent-to-Treat; mITT = modified Intent-to-Treat; OR = odds ratio; PCA = purified *Candida albicans* antigen; SD = standard deviation; TEAE = treatment-emergent adverse event

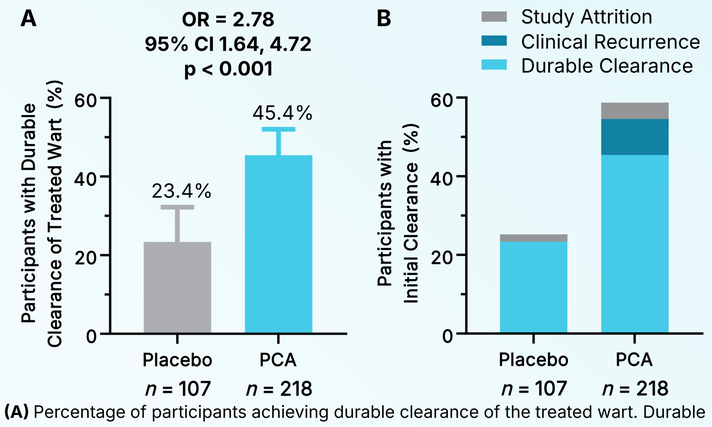
Results

Table 1. Demographic and Baseline Characteristics (mITT)

Characteristic	Placebo (*N* = 107)	PCA (*N* = 218)
Age (years), Mean (SD)	33.3 (17.30)	33.8 (17.44)
Sex, n (%)		
Female	45 (42.1%)	102 (46.8%)
Male	62 (57.9%)	116 (53.2%)
Race, n (%)		
Asian	35 (32.7%)	69 (31.7%)
Black or African American	1 (0.9%)	6 (2.8%)
Other[a]	5 (4.7%)	9 (4.0%)
White	66 (61.7%)	134 (61.5%)
Ethnicity, n (%)		
Hispanic or Latino	12 (11.2%)	31 (14.2%)
Not Hispanic or Latino	90 (84.1%)	179 (82.1%)
Unknown/Not Reported	5 (4.7%)	8 (3.7%)
Age of Treated Wart (years), Mean (SD)	2.8 (4.14)	3.3 (5.46)
Prior Treatment of Treated Wart, n (%)	42 (39.3%)	87 (39.9%)
Total Number of Mapped Warts, Mean (SD)	6.6 (4.24)	7.1 (4.54)

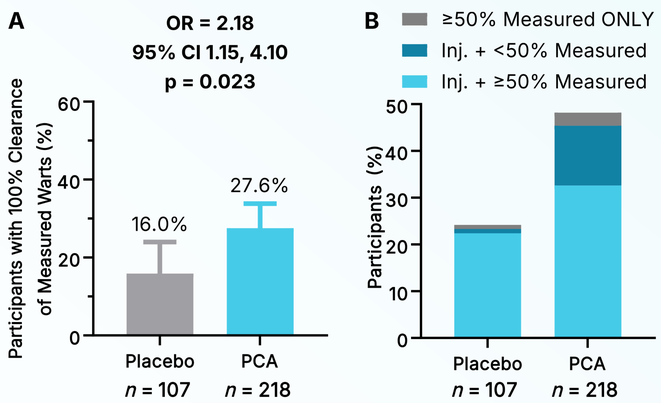
[a] "Other" includes American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, Not Reported, or Other

Figure 2. PCA Significantly Increased Durable Wart Clearance and Demonstrated Sustainability of Response Through 12 Weeks Post-Treatment (mITT)



(A) Percentage of participants achieving durable clearance of the treated wart. Durable clearance was defined as complete clearance of the treated wart maintained for at least 12 weeks. Odds ratio calculated by CMH test. Error bars represent 95% confidence intervals (Wilson-Brown). **(B)** Breakdown of 12-week clinical status relative to the total mITT population.

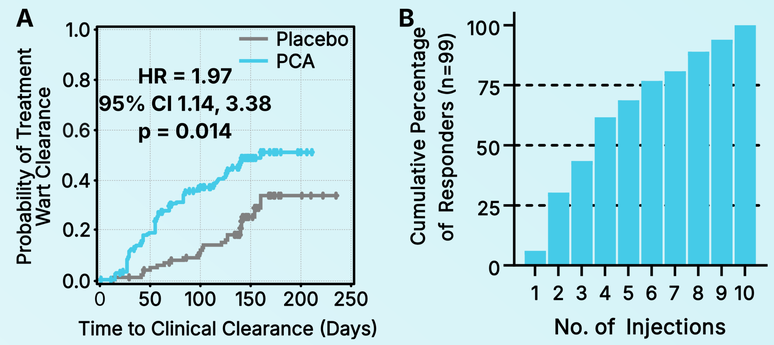
Figure 3. PCA Significantly Increased Clearance of Measured Untreated Warts; Most PCA Responders Achieved Resolution of Both Treated and Distal Lesions



(A) Participants (%) achieving 100% clearance of measured distal warts. OR calculated by CMH test. Error bars represent 95% CI (Wilson-Brown). **(B)** Depth of clinical response across injected (Inj.) and measured warts.

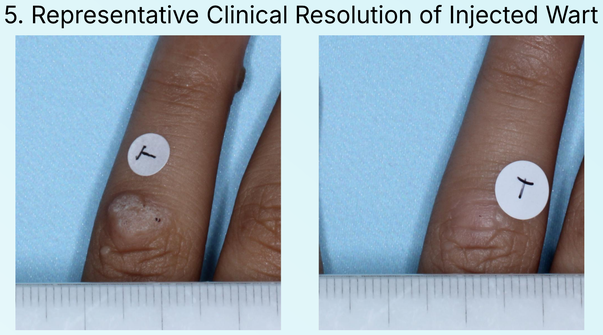
Results (cont.)

Figure 4. PCA Treatment Significantly Accelerated Time to Resolution of Injected Wart; >60% of Responders Achieved Durable Clearance Within Four Injections.



(A) Cumulative incidence of treatment wart resolution. PCA demonstrated a significantly faster time to resolution compared with placebo. HR calculated by Cox Proportional Hazard Model with Wald test. **(B)** Cumulative percentage of PCA-treated responders (n = 99) reaching durable clearance by injection count.

Figure 5. Representative Clinical Resolution of Injected Wart



(A) Baseline appearance of a treated wart. **(B)** Complete clinical clearance of the wart after 3 injections of PCA.

Table 2. PCA Treatment Was Well Tolerated with Low Rates of Treatment-Related Adverse Events and Study Discontinuation

Event Category, n (%)	Placebo (*N*=116)	PCA (*N*=235)
Summary of TEAEs		
≥ 1 TEAE	40 (34.5%)	113 (48.1%)
≥ 1 Treatment-Related TEAE	2 (1.7%)	20 (8.5%)
≥ 1 Serious Adverse Event (SAE)	1 (0.9%)	3 (1.3%)
≥ 1 TEAE leading to study discontinuation	1 (0.9%)	1 (0.4%)
Common TEAEs (> 5% in any group)		
Nasopharyngitis	7 (6.0%)	26 (11.1%)

TEAE = treatment-emergent adverse event

Conclusions

- **Purified *Candida albicans* antigen (PCA) significantly improved clearance of treated warts without recurrence** vs. placebo including the 12-week observation period, meeting the primary study objective.
- **>60% of PCA responders achieved durable clearance within 4 injections.**
- **A potent systemic effect was observed**; PCA significantly increasing the resolution of non-injected distal warts.
- PCA was **well-tolerated with a favorable safety profile.**
- **PCA may provide a first-line, single-site alternative to traditional destructive therapies for treating multiple warts.**

Disclosures: