



Efficacy of Cyanoacrylate (PeriAcryl®90 HV) in its Adhesive Post-Operative Properties on Periodontal Wound Healing and Patient Discomfort after Non-Surgical Periodontal Treatment: A Pilot Randomized Clinical Trial

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OBJECTIVES



- The oral microbiome with its multitude of resident microorganisms and disease associated inflammatory markers is not a localized closed environment.
- Severe periodontitis is the 6th most prevalent disease worldwide with an overall prevalence of 11.2%. Global Burden of Disease stated an increased by 57.3% from 1990-2010¹.

Mechanical disruption of the oral microbiome both professionally via nonsurgical debridement (NSPT) and daily patient oral-self care are currently the standard of care^{2,3}

Challenges in providing NSPT are the patient's discomfort and compliance to future care.

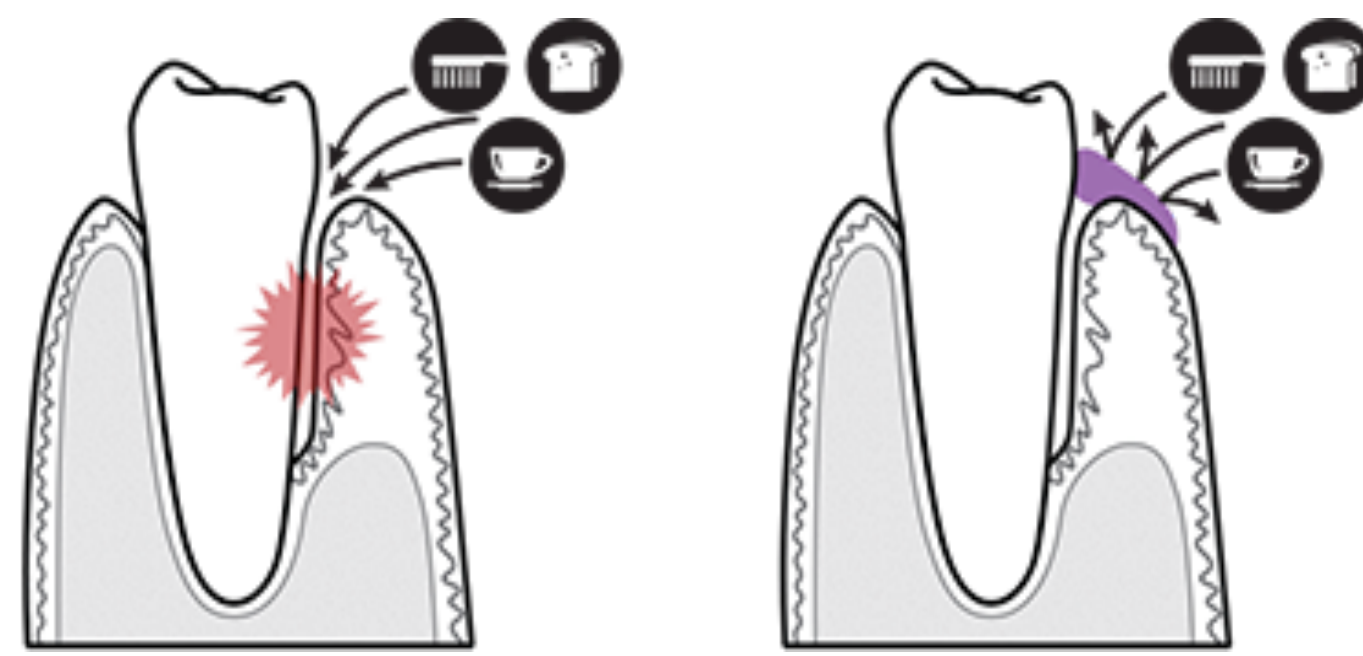


Definite discomfort & variable degrees of pain perceived following NSPT	Matthews et al 1993 ⁴ , Pihlstrom et al 1999 ⁵ , Fordal et al 2002 ⁶
90% patients experienced some pain following NSPT; 16% reported pain being moderate to strong and 23% self medicated with analgesics to relieve post-procedural pain	Pihlstrom et al 1999 ⁵
Root dentin sensitivity increases following NSPT (50-98%)	Tammaro et al 2000 ⁷ , Lin et al 2010 ⁸
Reduced compliance in maintaining oral self care: increased plaque deposits- acidic milieu- vicious cycle of increased dentine sensitivity	Addy et al 1987 ⁹ , Suge et al 2006 ¹⁰
Anxiety/apprehension and denial for subsequent maintenance visits	Eitner et al 2006 ¹¹

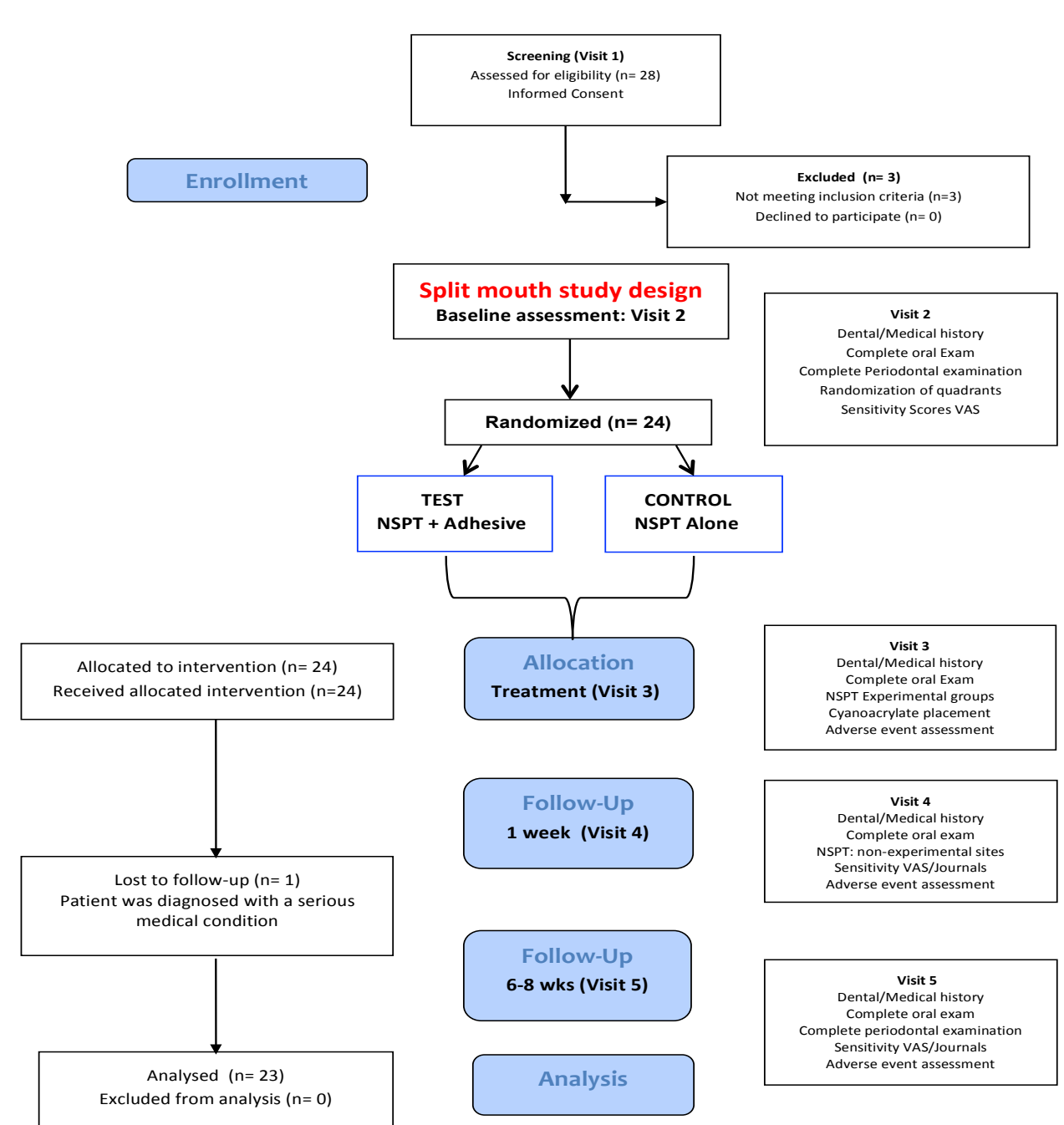
Rationale and Research Hypothesis

Marginal application of cyanoacrylate adhesive isolates the sub-gingival microenvironment which might:

- prevent increase sensitivity of teeth,
- discomfort of soft (gingiva) tissues,
- promote periodontal wound healing and
- reduce overall inflammatory process following NSPT.



METHODS



Inclusion Criteria
<ul style="list-style-type: none"> Capable of giving informed consent & ≥19 years of age Minimum of 18 teeth & at least 4 sites with PD ≥ 5.0 mm with BOP in at least 2 different quadrants Understand and communicate in English Willing and able to return for treatment and evaluation
Exclusion Criteria
<ul style="list-style-type: none"> Antibiotics/prescribed anti-inflammatories in last month Pregnant/ nursing or planning pregnancy Active smoking history (tobacco or otherwise) Overt abscess, active caries or crown/root fractures Adverse reactions/allergies to cyanoacrylates or formaldehyde Any significant disease or take medications

Primary and Secondary Outcomes

Primary Outcomes:

- Clinical Attachment Level (CAL) measured via Florida Probe
- Tooth Sensitivity using a Visual Analog Scale (VAS)

Secondary Outcomes:

- Plaque Index (PI)
- VAS scores of patient perception and acceptability of:
 - Soft & hard tissue discomfort and
 - Acceptability of adhesive and treatment
- Bleeding on Probing (BOP)
- Pocket Depths (PD) measured via the Florida Probe



Florida Probe¹²:

- Constant probing force: 0.15N
- Precision: ± 0.2mm
- Automated & Digital output
- Greater reliability with research studies.

METHODS

CYANOACRYLATE: High viscosity blend of N-butyl & 2-octylcyanoacrylate

Indications^{14,15,16,17}

- Alternative to sutures
- Stabilizing soft tissue grafts
- Hemostasis
- Traumatic lacerations
- Ocular surgeries
- Mycardial tears
- Inguinal hernia repairs
- Sealing of CSF leaks
- Cosmetic rhinoplasty



Properties^{13,18}

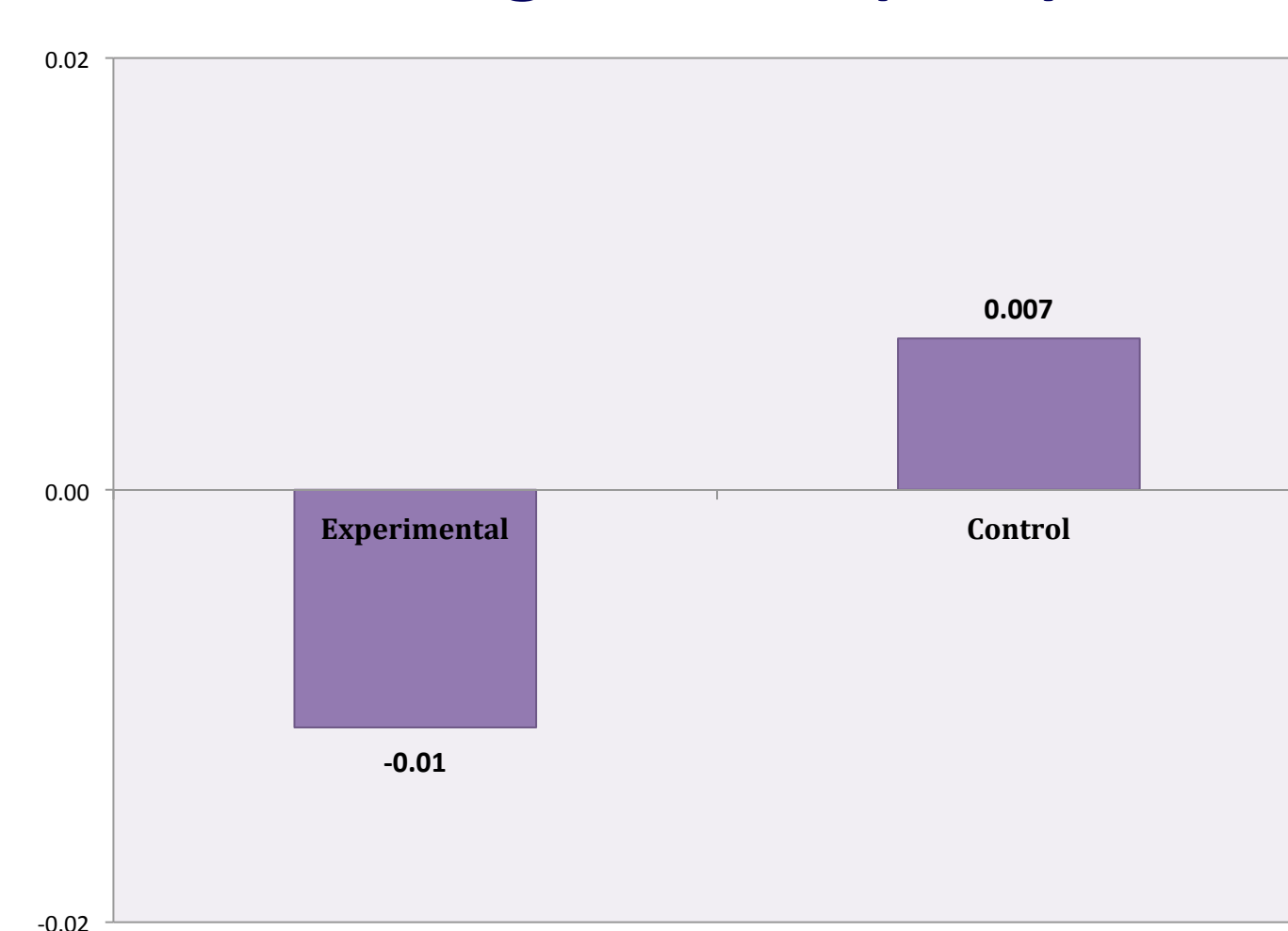
- Antimicrobial
- Nontoxic
- Hemostatic
- Self-shedding (5-10 days)
- Quick, easy application
- Strong immediate adhesion
- Rapid setting time
- Reduces sensitivity
- Barrier against microbial penetration
- Multi use vials; Cost-effective

Scheduled Visits:

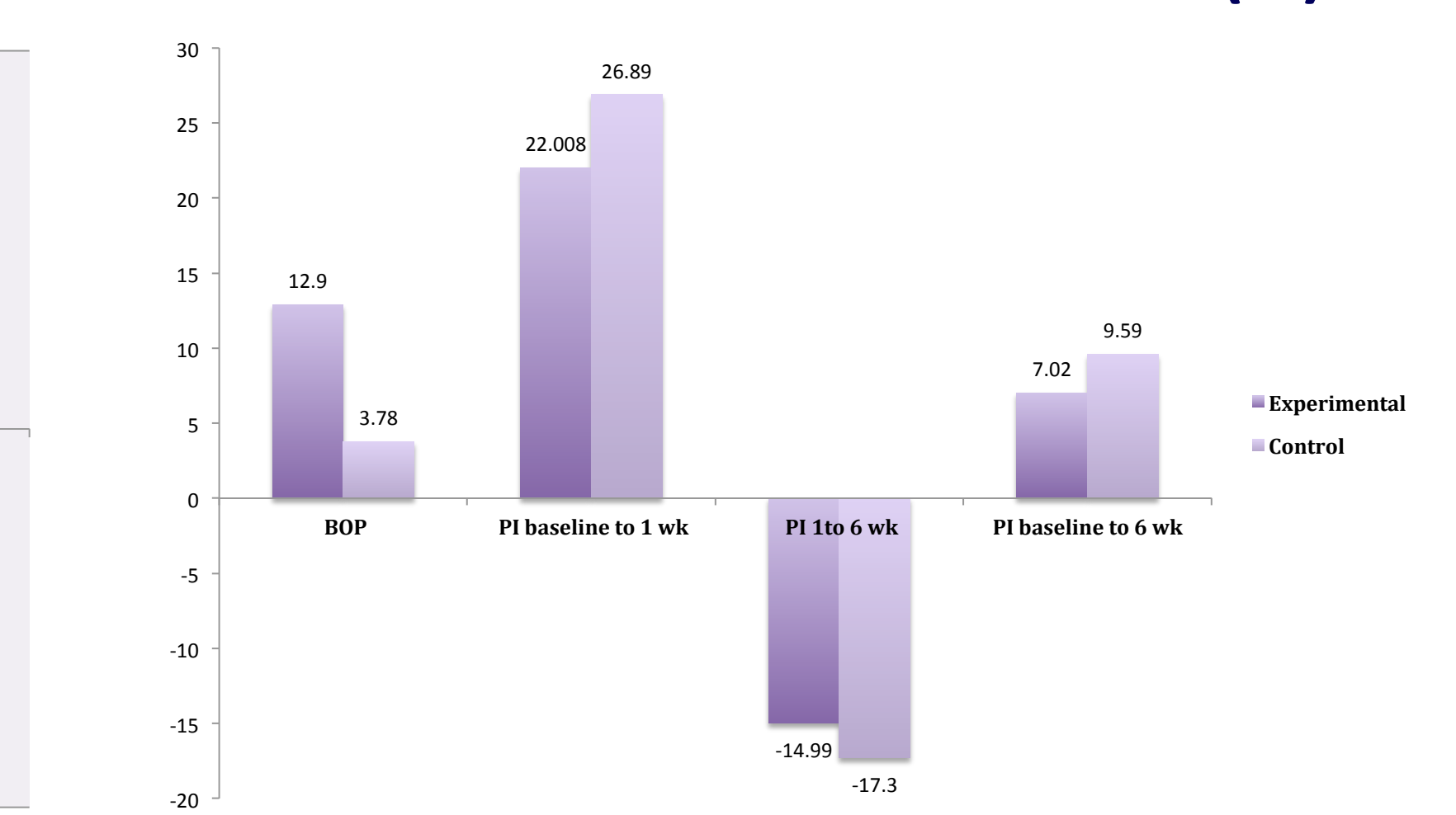


RESULTS

Change in CAL (mm)



Reduction in BOP and PI (%)

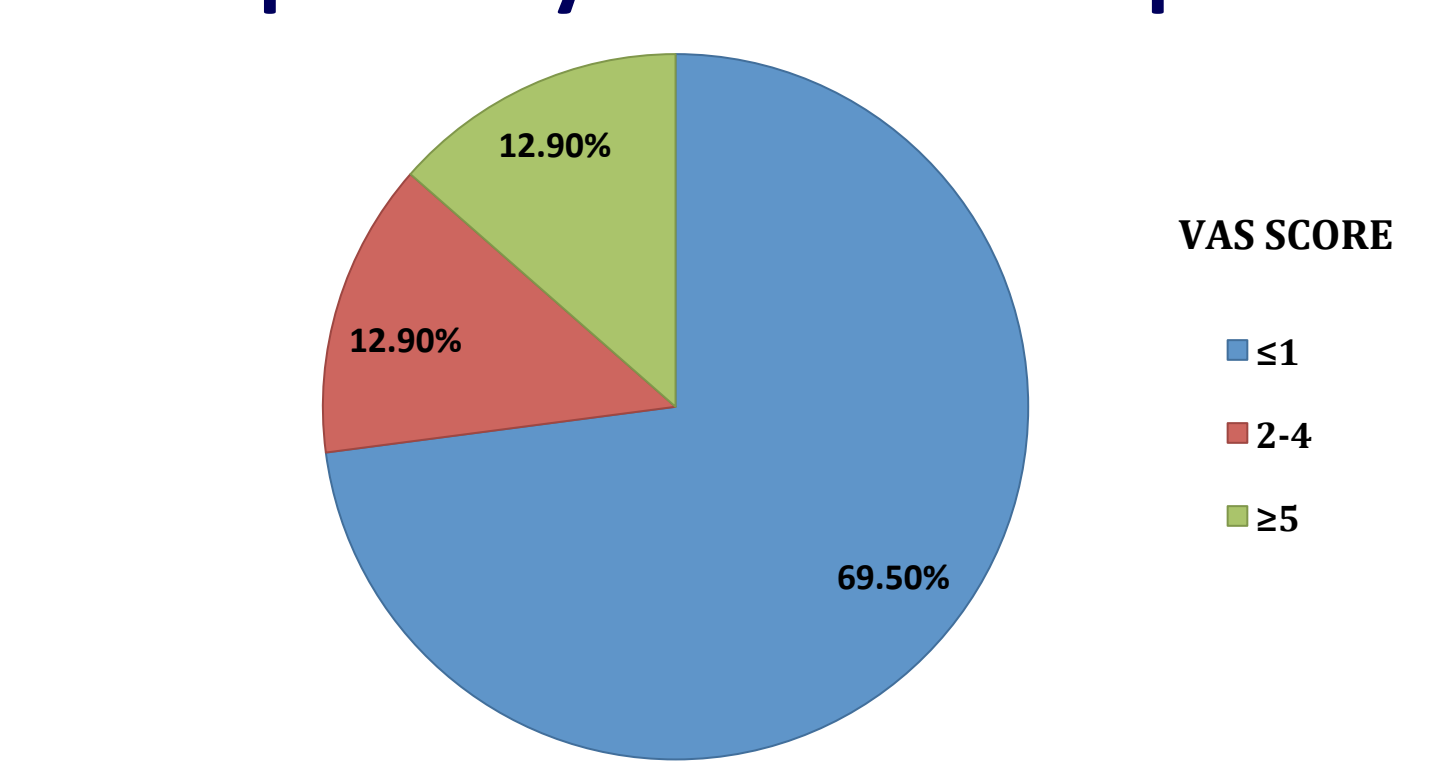


Change in sensitivity of teeth(VAS)

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
1 The medians of delta VAS1 are the same across categories of Treatment.	Independent-Samples Median Test	.368	Retain the null hypothesis.
2 The medians of delta VAS2 are the same across categories of Treatment.	Independent-Samples Median Test	.748	Retain the null hypothesis.
3 The medians of delta VAS are the same across categories of Treatment.	Independent-Samples Median Test	.914	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Acceptability of treatment provided



CONCLUSIONS

The application of cyanoacrylate after NSPT in this pilot study resulted in a clinically significant reduction of BOP (p=0.017*). Sixteen patients (69.5%) found the application of the adhesive highly acceptable. The changes in CAL and PD as well as decrease in teeth sensitivity at 6-8 weeks following NSPT, was not found to be statistically significant.

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