INTERNAT BLANC

2020 – 2021

Annales de l'Université Lyon 1
Faculté d'odontologie

Année universitaire
2020 – 2021

Université Lyon 1
Faculté d'odontologie

INTERNAT BLANC

Petites Questions

FACULTE D'ODONTOLOGIE DE LYON – Internat blanc 2021

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NOM : **Prénom :**

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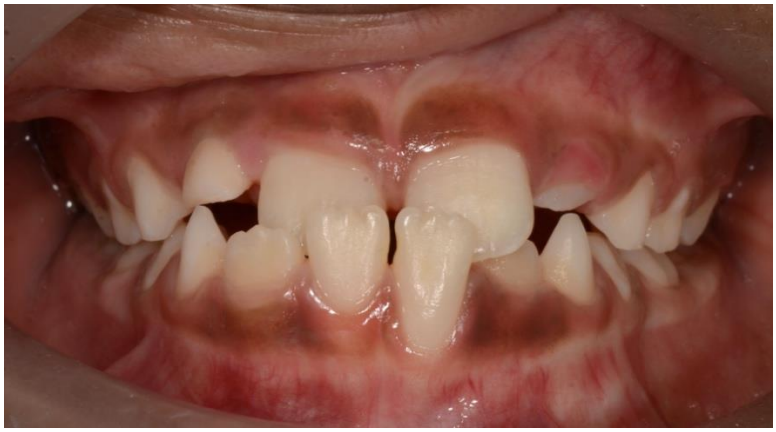
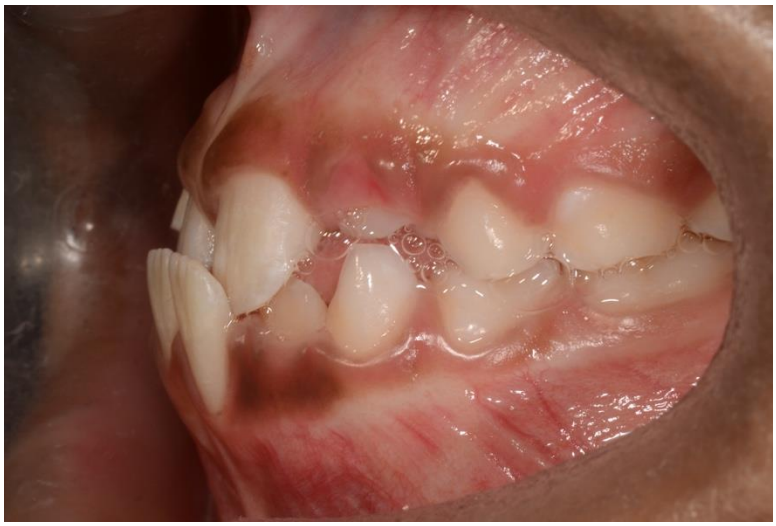
1. **Epreuve de Parodontologie (Dr Doriane CHACUN) – Petite question**

Votre correspondant ODF vous adresse ce petit patient de 6 ans et demi pour une prise en charge parodontale à la mandibule.

Que diagnostiquez-vous et quelle prise en charge recommandez-vous ?





2. **Epreuve de PROTHESES (Dr Christophe JEANNIN) – Petite question**

Une prothèse adjointe complète unimaxillaire maxillaire, dont la tenue lors des mouvements musculaires du patient est correcte, bouge durant les repas:
- citer les causes possibles de cette instabilité et les traitements pour y remédier
- citer des indices observables qui pourraient vous guider dans le réaliser un diagnostic différentiel

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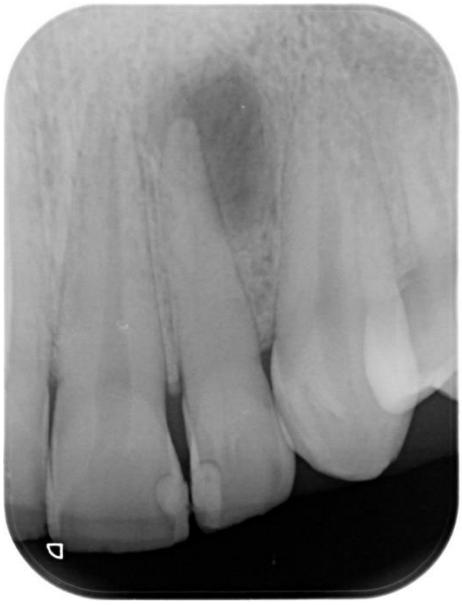
3. **Epreuve d'ODONTOLOGIE CONSERVATRICE ENDODONTIE (Pr Cyril VILLAT) – Petite question**

Un patient âgé de 23 ans, en bonne santé générale consulte à l'occasion d'une visite de contrôle.
Le patient se plaint d'une discoloration de la 22.
L'examen clinique révèle une absence de douleurs à la palpation et à la percussion ainsi que des tests de vitalité négatifs.
Vous décidez de réaliser un cliché radiologique rétroalvéolaire de 22.

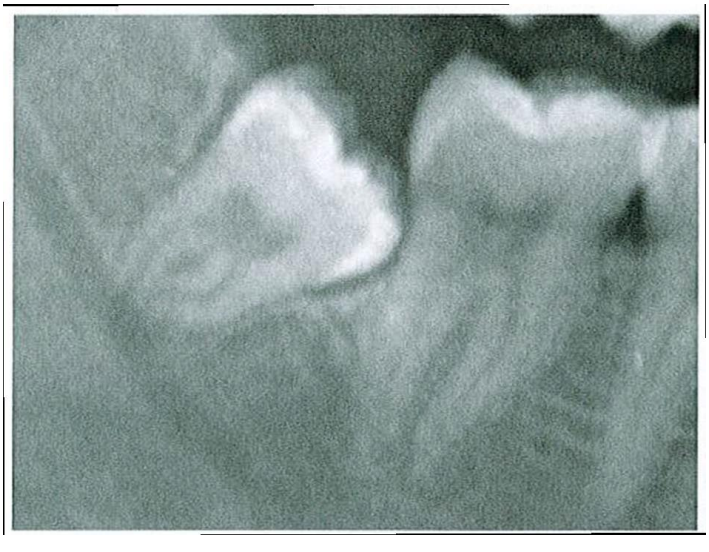
1. Commentez le cliché ci-dessous
2. Enoncez votre diagnostic
3. Décrivez et argumentez votre démarche thérapeutique



4. **Epreuve de CHIRURGIE BUCCALE, PATHOLOGIE et THERAPEUTIQUE (Dr Benjamin FITOUCHI) – Petite question**

Un patient de 34 ans consulte pour une douleur mandibulaire postérieure droite (EVA : 7/10). L'anamnèse révèle la prise de méthotrexate en traitement de fond contre une polyarthrite rhumatoïde. L.:inspection endobuccale révèle une tuméfaction érythémateuse en arrière de 47. La palpation endobuccale du trigone rétro-molaire droit est douloureuse et fait sourdre un liquide rouge pâle. La radiographie montre l'image suivante:

1- Quel est votre diagnostic ?
2- Quelle est la conduite immédiate à tenir ?



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Grandes Questions

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NOM : **Prénom :**

Epreuve d'ORTHOPEDIE DENTOFACIALE (Dr Mélaine PAYA-ARGOUD) – Grande question

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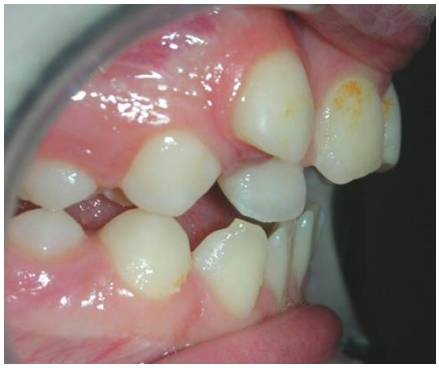
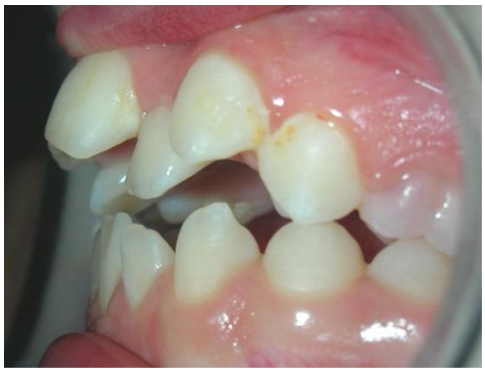
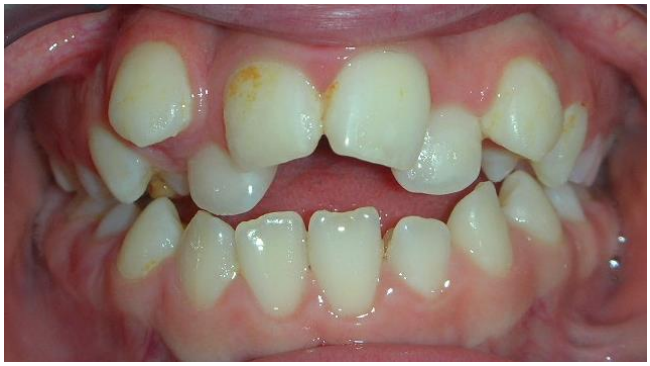
ORTHOPEDIE DENTOFACIALE – grande question

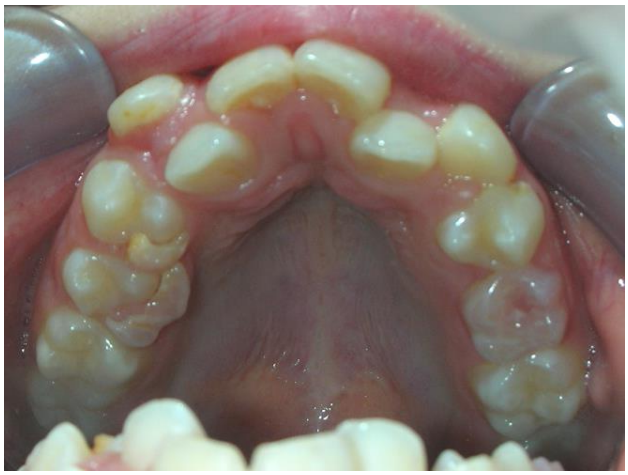
Vous recevez dans le cadre d'un contrôle de routine une enfant âgé de

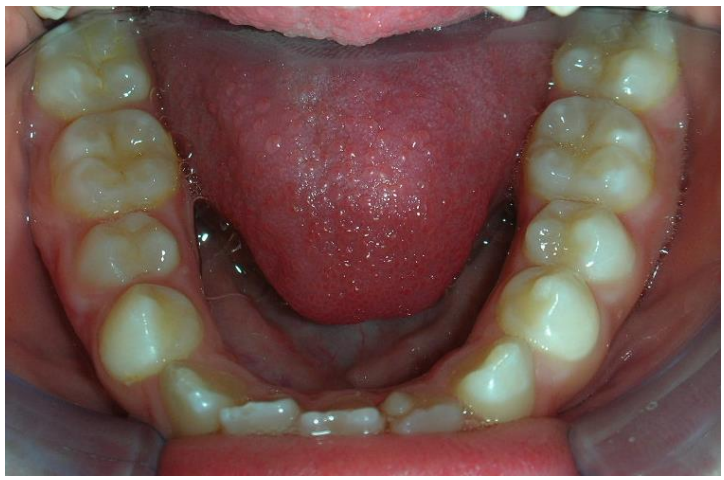
1 - Examen clinique
2- Diagnostic synthétique et différentiel
3- Possibilité de gestion de l'encombrement maxillaire
4 – Propositions de traitement maxillomandibulaire avec leurs avantages et inconvénients











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Epreuve d'ODONTOLOGIE PEDIATRIQUE (Pr Jean-Jacques MORRIER) – Grande question

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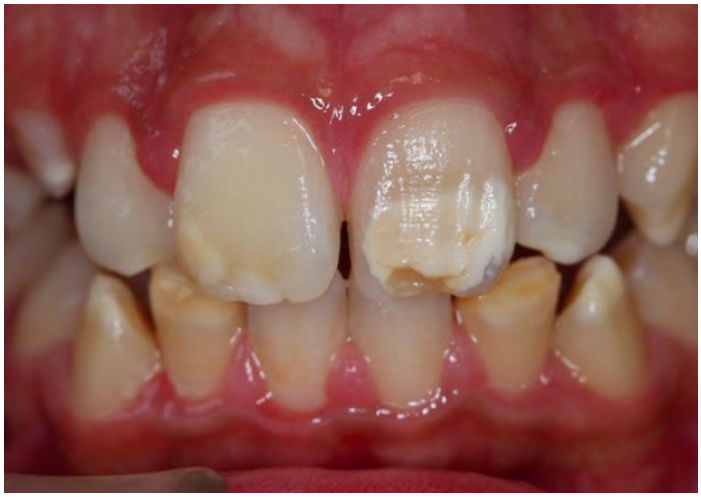
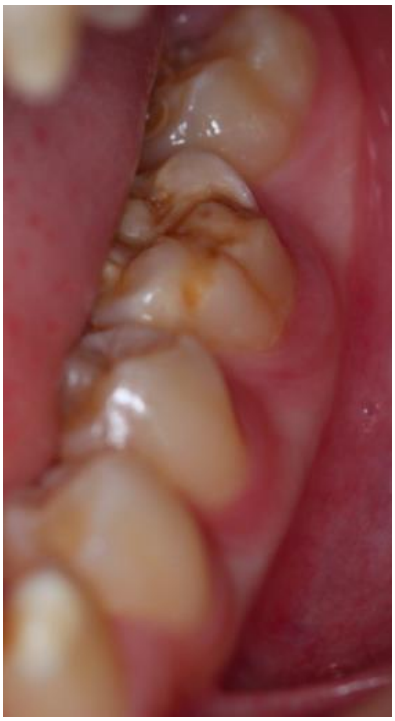
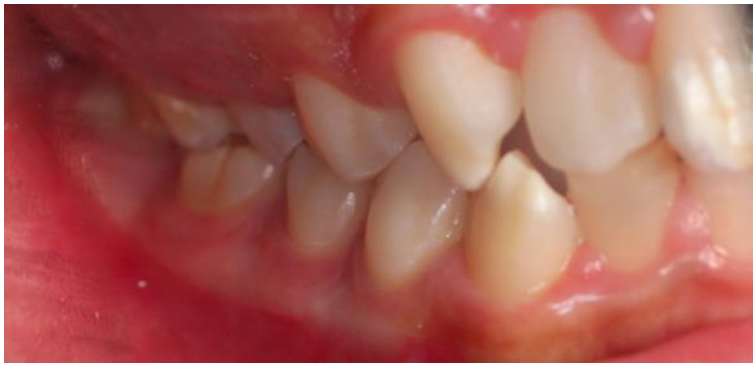
ODONTOLOGIE PEDIATRIQUE – Grande question

Cet enfant, coopérant, se présente à votre consultation pour le motif suivant : tâches disgracieuses sur les incisives et douleurs au brossage et à l'alimentation dans le secteur postérieur.

1. Qu'observez-vous sur les images cliniques ? Que recherchez-vous ?
2. Quelle est la formule dentaire. Quel est l'âge dentaire de cet enfant ? Justifiez
3. Réalisez-vous des examens complémentaires ?
4. Quel est votre diagnostic ? Justifier le
5. Quelle est votre attitude thérapeutique en urgence ?
6. Quelle est votre attitude thérapeutique à moyen et long terme







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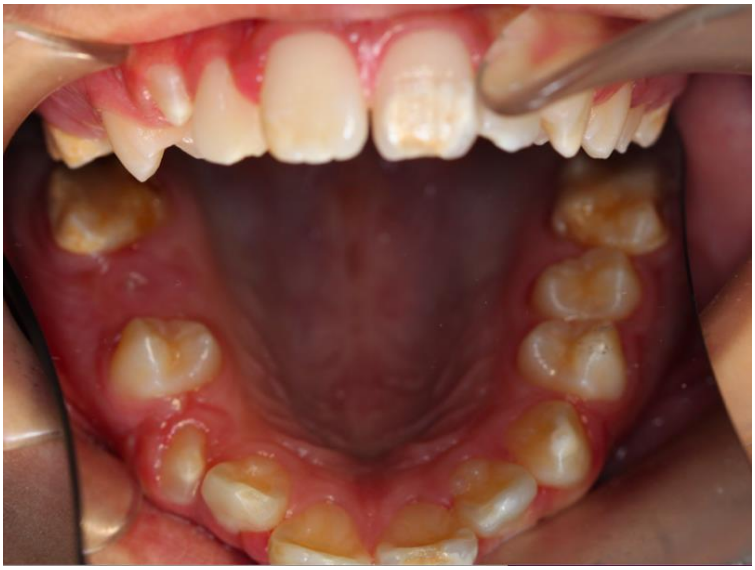

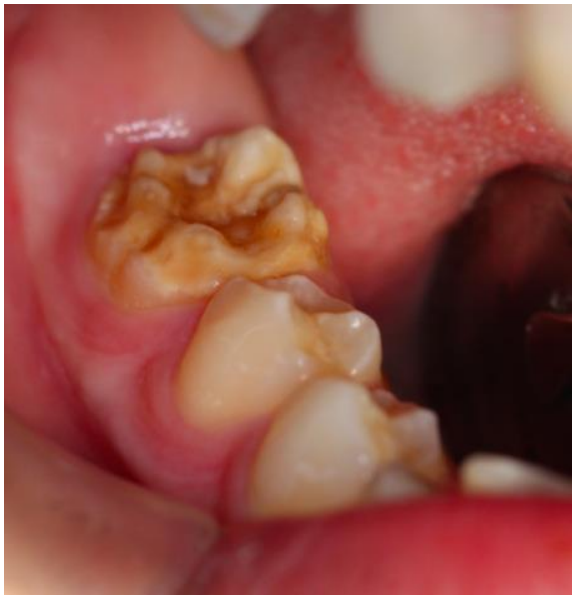

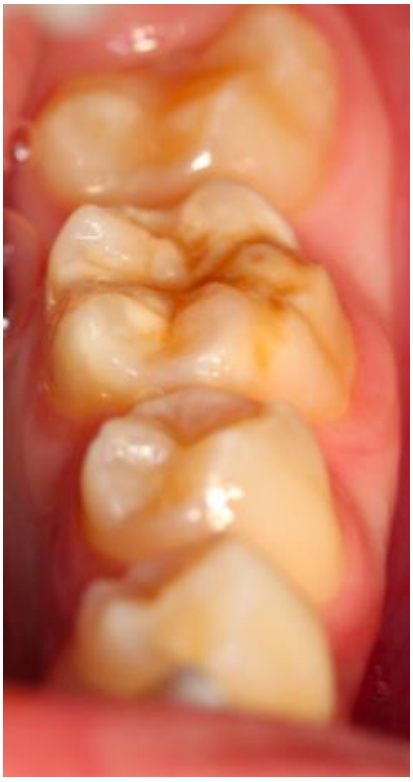

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Lecture Critique d'Article

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HUMAN RANDOMIZED CONTROLLED TRIAL

[redacted]

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[redacted]

1 | INTRODUCTION

Diagnosis of periodontitis progression and repair is made based on clinical measurements including presence or absence of bleeding on probing (BOP), severity of bone loss and attachment loss, probing depth (PD), and clinical attachment level (CAL). Biomarkers of inflammation can be detected in gingival crevicular fluid (GCF), and interleukin

(IL)-1β has been shown to be associated with periodontitis progression.[1]

Patients initially and successfully treated by removal of bacterial biofilm, calculus, and toxic cementum through scaling and root planing (SRP), and potentially surgical treatment, are then placed into a periodontal maintenance therapy (PMT) program consisting of dental visits every 3 to 4 months where he/she receives continued periodontal evaluation and monitoring, biofilm and root surface decontamination, and oral hygiene instructions. Participation in PMT is critical to the long-term success of periodontal treatment.[2–6]

However, not all patients remain stable with conventional PMT modalities. For instance, isolated deep interproximal pockets (≥6 mm) may develop. Therefore, adjunctive therapies have been developed and added to retreatment. These adjuncts include systemic antibiotics,[7] local delivery of antibiotics,[8] subgingival irrigation,[9] lasers,[10] and varying biologics and growth factors.[11] These adjunctive therapies aim to decrease the bacterial load, aid in the reduction of inflammation, and stimulate new attachment to the root or bone growth. Outcomes to these approaches during PMT are rarely reported and are often suboptimal.[12] Another approach includes retreatment with conventional periodontal surgery, but patients and practitioners may prefer to treat as conservatively as possible.[13] Less invasive approaches with enhanced root surface detoxification, with or without local application of drugs known to stimulate periodontal regeneration, would add a valuable option for retreatment.

The use of enamel matrix derivative (EMD)* as an adjunct to periodontal therapy is proposed for regeneration of lost periodontal structures.[14,15] The use of EMD has most often been studied in conjunction with surgical periodontal treatment to repair intrabony defects, and showed varying degrees of success and efficacy with its use.[16–19] Although little impact was noted when adding sulcular EMD following SRP,[11,19] simple papilla reflection has not been tested to allow enhanced root preparation and EMD application during PMT. Much of the data surrounding the use of EMD are conflicting. Evidence for the use of EMD in periodontal maintenance patients with supra-alveolar pockets (horizontal defects) is lacking, therefore, further research is indicated in the use of EMD in this patient population.

The hypothesis of the current clinical trial was that interproximal papilla reflection, root preparation (root planing) with fiberoptic visualization and etching, with the addition of EMD as the experimental intervention relative to saline control, will improve CAL (primary outcome), PD, inflammation (BOP, GCF IL-1β), and improve bone height of deep interproximal pockets during PMT not associated with intrabony defects. The objective of this study was to determine the effect of EMD application on the CAL, PD, BOP, IBH, and GCF IL-1β levels in a localized ≥6 mm interproximal pocket in periodontal maintenance patients.

* Emdogain, Straumann, Andover, MA.

2 | MATERIALS AND METHODS

2.1 | Patient population and study design

The clinical phase of the trial was conducted from February 2017 to July 2018. This 12-month randomized, double-masked, parallel interventional clinical trial included randomization of 50 individuals (26 males, 24 females) regularly attending the University of Nebraska Medical Center College of Dentistry for PMT. The CONSORT flowchart[20] is shown in Figure 1. The inclusion criteria for the study included patients between the ages of 40 and 85 years, a periodontal diagnosis of grade III-IV, grade B periodontitis, one quadrant with at least three posterior teeth and one 6- to 9-mm interproximal PD, overall good systemic health, and a history of regular PMT. Exclusion criteria consisted of patients with systemic diseases that significantly affect periodontal inflammation and bone turnover (e.g., chronic use of steroids or non-steroidal anti-inflammatory drugs, estrogens, bisphosphonates, calcitonin, methotrexate, antibiotics, >325 mg aspirin/day), surgical periodontal therapy within the past year, and pregnant or breast-feeding females. Following written informed consent (obtained by AK, RR, JP), patients were randomly assigned to the test group with papilla reflection/root planing, fiberoptic assessment, etching + EMD (PR/RP +EMD) or the control group with saline (S) instead of EMD (PR/RP + S). Groups were randomized by sex and smoking status by a clinician not involved with clinical measurements (EJ, JG). Using a positioning device to lock the radiograph head to the sensor holder with consistent geometry, standardized vertical bitewing radiographs were exposed at baseline and 12-month visits to measure interproximal bone height (IBH). Clinical measurements (PD, CAL, BOP) were obtained at baseline, 6 and 12-months and GCF samples were obtained at baseline, 2-week, and 6- and 12-month visits by one of three calibrated clinicians (RR, AK, JP). After completion of the experimental phase of treatment, detailed below, PMT was completed by MC at the same appointment. Periodontal maintenance therapy was also performed at 3-month, 6-month, 9-month, and 12-month appointments. Intervention was initiated on all 50 patients, 48 of whom completed the 12-month PMT (4% dropout rate). One patient did not return following the 6-month post-treatment exam due to the extraction of the test tooth due to root caries. The second patient died following the 3-month post-treatment exam. Both reasons for patient dropout were not believed to be related to the dental therapy administered. Study-wide, patient-reported sensitivity and the reported use of pain medication following the

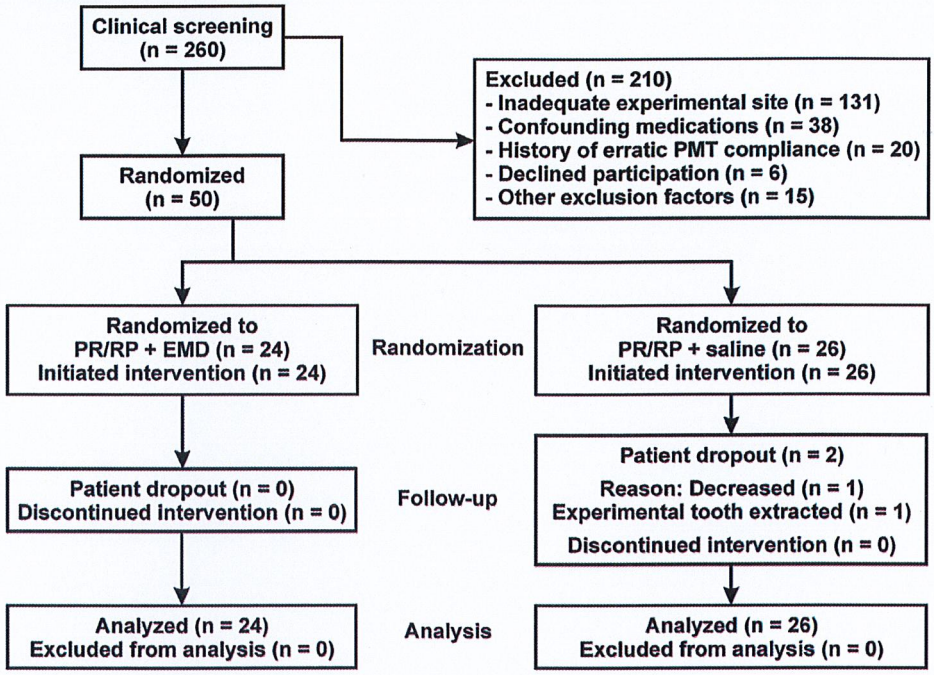

FIGURE 1 CONSORT flow diagram

TABLE 1 Differences in demographics between groups

Variable	EMD (n)	EMD (%)	Saline (n)	Saline (%)	*P*-value
Sex					
Female	13	54.2	11	42.3	0.40
Male	11	45.8	15	57.7	
Smoking status					
Non-smoker	21	87.5	20	76.9	0.33
Smoker	3	12.5	6	23.1	
Mean age (±SD)	66.92 (±1.15)		64.96 (±2.06)		0.41

Race and ethnicity data were not collected for this study.

procedure was minimal. Baseline demographic characteristics of patients completing the trial are displayed in Table 1. The distribution of men and women, smokers and non-smokers, and age was not significantly different between groups.

The study was registered with ClinicalTrials.gov (NCT02972788) and approved by the University of Nebraska Medical Center Institutional Review Board (#783-16-FB) and was conducted in accordance with the Helsinki Declaration of 1975, as revised in 2013.

2.2 | Data collection and treatment details

Examiners were calibrated for inter-examiner reliability and reproducibility using 48 randomly chosen sites. PD and CAL were reproducible at ± 1 mm for at least 85% of sites (AK-RR = 88, 92%; AK-JP = 92, 90%, RR-JP = 94, 96%). Intra-examiner reliability and reproducibility for IBH measurements (collected by EJ) were performed using 40 sites. Intraclass correlations were used for a two-way mixed model assessing absolute agreement—single measurement. An intraclass correlation was calculated using two-way mixed models assessing absolute agreement for a single measurement. According to Cicchetti,[21] an intraclass correlation (ICC) between 0.60 and 0.74 is good, and an ICC between 0.75 and 1.00 is excellent. The ICC for intra-rater reliability for IBH was 0.95.

For treatment site BOP measurements, both lingual and buccal sites were assessed, regardless of the site of the deepest PD. BOP was considered present at baseline if at least one site had the condition present, and absent at 12 months if neither site bled. During data collection, supragingival plaque was removed (and recorded) from the test teeth with a dental explorer, then an absorbent paper strip* was inserted into

* PerioPaper strips, Oraflow, Hewlett, NY

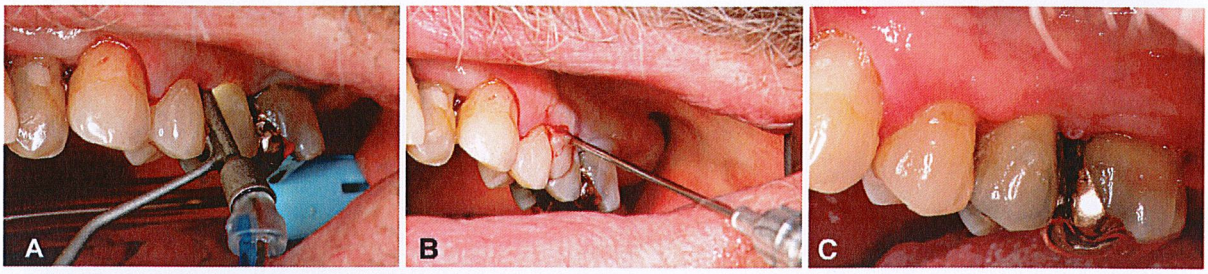

FIGURE 2 **A**) The perioscope is used to determine the removal of subgingival calculus. **B**) The placement of enamel matrix derivative to the test site. **C**) Twelve-month postoperative condition of test site

the facial and lingual sulci of the experimental site for 30 seconds for collection of GCF. Paper strips from both facial and lingual sulci were pooled and immediately placed into a sterile vial and frozen at −80°C until further analysis. GCF strips contaminated with blood were discarded and collection was repeated. PD and recession (PD + recession = CAL) were then measured* at the six sites on each of the two teeth adjacent to the experimental interproximal area and BOP was recorded as positive for sites that bled within 30 seconds. Following data collection, treatment was completed by a single clinician (JG or EJ) not involved with clinical measurements. Following administration of local anesthesia to the experimental site, the papilla was released by diagonal interproximal incisions extending to the buccal and lingual/palatal line angles, and designed to retain buccal and lingual aspects of the papilla.[22] The deep interproximal soft tissue obscuring the contaminated root was removed to allow for access to the root and improved visualization with the fiberoptic unit† (Fig. 2). SRP was performed on the test and adjacent interproximal tooth surfaces. Verification of a clean and smooth root surface was done using an 11/12 explorer and by visualization with the fiberoptic scope. Following SRP and irrigation of the site with saline, the group assignment of the test site was done by EJ or JG. The root surface was then etched for 2 minutes with ethylenediaminetetraacetic acid‡ followed by irrigation with sterile saline. Randomization dictated whether the site received EMD (0.3 mL) or sterile saline (0.3 mL), which was placed at the base of the pocket and deposited up the root surface of the experimental and adjacent interproximal tooth to overfill (Fig. 2). Excess was removed using a damp gauze and compression of the buccal and lingual/palatal papilla. The papillae were re-approximated under pressure and sealed using cyanoacrylate tissue adhesive.§ Damp gauze pressure for 3 to 5 minutes was used to set the cyanoacrylate tissue adhesive and to stabilize clot formation. Routine periodontal maintenance therapy, including full-mouth periodontal charting, full-mouth debridement and root planing of inflamed pockets (excluding experimental site) was performed by MC. Patients were instructed to avoid flossing and brushing of the experimental site for 6 weeks (per EMD manufacturer's instructions). Twice daily antiseptic mouth rinse‖ was dispensed to aid in maintaining a low level of plaque accumulation at the test sites for 6 weeks postoperatively.

2.3 | Analysis of IL-1β in GCF samples

At the time of the analysis, sample strips were eluted into 1 mL phosphate buffered solution and gently agitated for 1 hour. GCF samples were analyzed for IL-1β using a quantitative sandwich enzyme immunoassay technique# according to manufacturer's instruction. All assay procedures were performed by an individual (JG) without knowledge of the therapy allocation. The microplate was read at a wavelength of 450 nm. The minimum detectable concentration was 3.9 pg/mL and the maximum detectable concentration was 250 pg/mL. The IL-1β concentration of a GCF sample from each site was the average of each sample's duplicate.

2.4 | Interproximal bone height

IBH measurements were made using standardized digital bitewing radiographs. For each site, measurements were made from the cemento-enamel junction to the most coronal aspect of the alveolar crest, where the periodontal ligament space was uniform. If a restoration was present on the tooth surface being measured, measurements were taken from the apical margin of the restoration to the most coronal aspect of the alveolar crest. IBH measurements were made at the treatment site, as well as interproximal of the adjacent tooth by a single examiner (EJ).

* UNC-15 probe, Hu-Friedy, Chicago, IL

† Perioscope, Zest Dental Solutions, Carlsbad, CA

‡ EDTA, Pref-Gel, Straumann, Andover, MA

§ PeriAcryl, Glustitch, Delta, BC, Canada

‖ Listerine, New Brunswick, NJ

R&D Systems, Human IL-1β.IL-1F2 Quantikine ELISA, Minneapolis, MN

TABLE 2 Clinical outcomes at treatment site

Baseline mean mm ± (SE)	*P*-value difference between groups at baseline	Model adjusted[b] change after 12 months mm ± (SE)	*P*-value change from baseline within a group	*P*-value difference in change between groups
PD				
EMD[a] 6.88 (0.24)		EMD −2.29 (0.21)	<0.0001	
	0.14			0.716
Saline[a] 6.46 (0.15)		Saline −2.39 (0.21)	<0.0001	
CAL				
EMD[a] 7.58 (0.28)		EMD −1.75 (0.30)	<0.0001	
	0.58			0.260
Saline[a] 7.35 (0.3)		Saline −2.20 (0.30)	0.0001	
PI				
EMD[a] 66% (7%)		EMD −23% (5%)	0.0001	
	0.90			0.129
Saline[a] 67% (5%)		Saline −12% (5%)	0.028	

[a]Both groups had PR/RP, plus EMD or saline. Mean ± (SE).

[b]Adjustment variables in model: initial measurement and worst side, negative number indicates postoperative improvement.

2.5 | Statistical analyses

A power analysis was completed to determine that a sample size of 24 to 27 treatment sites per group was necessary to achieve at least 80% power in detecting a minimum of 0.7 to 0.8 mm post-treatment change in CAL using two-sided Wilcoxon-signed rank test at a significance level of 0.025. The analysis was based on data confirmed in our previous 12-month study[23] where the standard deviation of clinical attachment change was 1.13 mm.

Differences between groups were assessed using Chi-Square for sex and smoking status, and *t* tests for age. For purposes of analysis for PD and CAL, only the measurement from the site with the deepest PD on the treatment surface was analyzed. For GCF IL-1β strips, both buccal and lingual samples were pooled so one value for each treatment site was reported. For PI measurements, both buccal and lingual sites were assessed, regardless of the site of deepest PD.

Differences in the proportion of patients with PI and BOP at baseline versus 12 months was assessed using McNemar tests, separately for EMD and control patients. For continuous measurements (PD, CAL, PI, GCF IL-1β), differences between groups, at a specific time in the experiment were assessed using *t* tests. Change in measurements (final minus initial) were assessed using linear models which adjusted for initial measurement and worst side. All statistical reporting of change in measurements are model-adjusted, unless reported as unadjusted. *P* values ≤0.05 were considered to be statistically significant and all analyses were performed using SAS software version 9.4.*

* SAS Institute, Cary, NC

3 | RESULTS

3.1 | Clinical outcomes

Comparisons of baseline and change (12 months minus baseline) data for PD, CAL, and PI on experimental interproximal surfaces are shown in Table 2. No differences were found in PD ($P = 0.14$), CAL ($P = 0.58$), or PI ($P = 0.90$), at baseline between groups. Both the PR/RP + EMD and PR/RP + S groups saw a reduction in PD (−2.29 ± 0.21 mm, $P < 0.0001$; −2.39 ± 0.21 mm, $P < .0001$) and gain in CAL (1.75 ± 0.30 mm, $P < 0.0001$; 2.20 ± 0.30 mm, $P < 0.0001$), from baseline to 12 months at the treatment site, but these observed changes did not significantly differ between groups (PD: $P = 0.716$; CAL: $P = 0.260$). Both PR/RP+EMD and PR/RP+S groups saw a reduction in the experimental teeth plaque index (PR/RP+EMD: −23% ± 5%, $P = 0.0001$; PR/RP+S: −12% ± 5%, $P = 0.028$), with no significant differences between the two groups ($P = 0.129$).

The interproximal site adjacent to the treatment surface (same interproximal space where the papilla was reflected) showed smaller but significant reductions in PD (PR/RP+EMD −0.89 ± 0.16 mm, $P < 0.0001$; PR/RP+S −0.84 ± 0.16 mm) and improvements in CAL (PR/RP+EMD −0.66 ± 0.18 mm, $P = 0.0001$; PR/RP = S −0.59 ± 0.18 mm, $P = 0.002$); however, these changes in measurements did not significantly differ between groups (PD; $P = 0.799$; CAL; $P = 0.743$). Similarly, the direct buccal and lingual sites of the experimental teeth saw small, but statistically significant improvements for both groups in PD (PR/RP+EMD −0.44 mm ± 0.08 mm, $P < 0.0001$; PR/RP+S −0.30 mm ± 0.08 mm, $P = 0.001$) and a significant improvement in CAL in the control groups, but not the EMD group (PR/RP+EMD

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TABLE 3 Interproximal bone height outcomes

Baseline mean mm ± (SE)	*P*-value difference between groups at baseline	Model adjusted[b] mean change baseline – 12 months mm ± (SE)	*P*-value difference from baseline within group	*P*-value difference in change between groups
Treatment site				
EMD[a] 5.1 (0.36)		EMD −0.20 (0.18)	0.28	
	1.0			0.61
Saline[a] 5.09 (0.37)		Saline −0.33 (0.18)	0.08	
Adjacent site				
EMD[a] 4.51 (0.43)		EMD −0.04 (0.16)	0.81	
	0.53			0.53
Saline[a] 4.87 (0.38)		Saline −0.18 (0.18)	0.26	

[a]Both groups had PR/RP, plus EMD or saline.

[b]Negative number indicates postoperative improvement.

0.24 mm ± 0.13 mm, $P = 0.082$; PR/RP+S 0.50 mm ± 0.13 mm, $P < 0.001$); however, the differences in the measured change between the groups were not significant (PD: $P = 0.198$; CAL: $P = 0.144$).

3.2 | Radiographic outcomes

No significant differences were found in IBH between groups at baseline for the treatment site ($P = 1.0$) or the adjacent site ($P = 0.53$) (Table 3). The small differences between treatment and adjacent sites support that deep intrabony defects were not included in the study. Both groups had stable IBH at the treatment site over 12 months (PR/RP+EMD: −0.20 ± 0.18 mm, $P = 0.28$; PR/RP+S: −0.33 ± 0.18 mm, $P = 0.08$), with no significant differences between the groups ($P = 0.61$).

3.3 | Inflammatory outcomes

The mean baseline, 6-month, and 12-month post-therapy measurements of BOP are presented in Table 4. The mean baseline BOP for PR/RP + EMD and PR/RP + S were not statistically different ($P = 0.75$). The difference in BOP at the 6-month and 12-month post-therapy visit between both groups was also not statistically different (6 months $P = 0.44$, 12 months $P = 0.38$), nor was the change observed from baseline to 6 months for either group (EMD $P = 0.13$, saline $P = 0.74$). However, compared with baseline, BOP was reduced significantly for both groups following 12 months of PMT. Sites receiving PR/RP + EMD demonstrated a BOP reduction of 25% ($P = 0.0034$) whereas those sites receiving PR/RP + S had a 33.3% ($P = 0.011$) BOP reduction.

Comparisons of IL-1β levels for PR/RP + EMD and PR/RP + S taken at baseline, 2-week, 6- and 12-months post-therapy are shown in Table 4. When assessing the change in IL-1β levels compared with baseline (Table 4), a reduction in IL-1β with PR/RP + EMD was seen at 2-weeks post-therapy (mean = −40.15 ± 19.57, $P = 0.05$) but this change did not significantly differ from the change observed in the saline group (mean = −23.64 ± 17.87, $P = 0.19$; between group comparison of change $P = 0.82$). At 12-months post-therapy, a trend toward reduction of IL-1β levels also was seen with the EMD group (mean = −32.85 ± 17.99, $P = 0.07$) compared with PR/RP + S (mean −14.13 ± 16.78, $P = 0.40$) and the observed changes did not differ between groups ($P = 0.41$).

4 | DISCUSSION

The primary outcome measure in this study was change in CAL, with changes in IBH, PD, PI, BOP, and IL-1β as secondary outcome measures. The significant gain in CAL was shown in both the test (1.75 ± 0.3 mm) and control (2.2 ± 0.3 mm) groups and were slightly greater than those reported for root planing as part of initial therapy (1.29 mm in sites with PD >7 mm[24] and other review studies[25,26]). In the current study, the PD reduction of 2.29 mm was seen in the PR/RP+EMD groups and 2.39 mm in the PR/RP+S group were similar to the 2.16 mm PD reduction reported by Cobb.[24] Since PMT sites in the current study had been periodically subjected to subgingival root planing without flap reflection, yet persisted with deep pockets and BOP, it may be suggested that CAL improvement would be less predictable than those sites where initial therapy was not preceded by recent instrumentation.[24–26] Therefore, current results suggest that further benefit may be achieved with PR/RP in persistent deep sites that had been included in previous PMT with periodic conventional root planing, presumably due to better access to the root for instrumentation and assessment.

The addition of EMD did not provide enhanced CAL or PD improvements. These results are in line with those found by Gutierrez et al.[27] comparing the addition of EMD to SRP with SRP alone during initial therapy. That study reported a PD reduction of 2.3 ± 0.5 mm in the control (SRP) sites and 2.0 ± 0.3 mm in the experimental (SRP + EMD) sites, with no

TABLE 4 Inflammatory outcomes at treatment site

Baseline mean	*P*-value difference between groups	Mean difference over time		*P*-value (mean difference between groups)	Mean difference over time 6 months	*P*-value difference over time	*P*-value (mean difference between groups)	Mean difference over time	*P*-value (mean difference over time)	*P*-value (mean difference between groups)
BOP (%)					BOP (%)			BOP (%)		
EMD 75.0	0.75				−20.3	0.13	0.44	−25.0	0.0034	0.38
Saline 70.8					−8.3	0.74		−33.3	0.011	
GCF IL-1β pg per 30 seconds sample ± (SE)		IL-1β pg per 30 seconds sample ± (SE) 2 weeks	*P* value (mean difference)		IL-1β pg per 30 seconds sample ± (SE) 6 months			IL-1β pg per 30 seconds sample ± (SE) 12 months		
EMD 141.10 (25.44)	0.34	−40.15 (19.57)	0.05	0.82	−32.66 (21.66)	0.14	0.34	−32.85 (17.99)	0.07	0.41
Saline 109.38 (20.84)		−23.64 (17.87)	0.19		−15.51 (20.08)	0.44		−14.13 (16.78)	0.40	

significant differences between the groups ($P > 0.4$). However, Jentsch and Purschwitz[28] reported that EMD + flap access RP improved CAL (2.7 ± 0.8 mm) significantly more ($P = 0.004$) in ≥7 mm pockets than the control group without EMD (0.8 ± 0.6 mm).

It should be noted that sites in the present study were not intrabony defects where EMD alone with papilla preservation surgery has been shown effective.[29–31] Therefore, use of horizontal defects could be considered a limitation of the current study. A rare study[32] of supra-alveolar defects with simplified papilla preservation flaps and EMD showed greater PD reduction (3.4 ± 0.7 mm) and CAL improvement (2.8 ± 0.8 mm) in the EMD groups than the current study. However, that investigation was treating subjects just after initial therapy (not persistent pockets on PMT), with full flap reflection, and included anterior teeth.

Statistical improvements in clinical outcomes (CAL and PD) also were seen in the current study at sites other than the treatment surface (adjacent, direct buccal, and lingual). Most of these improvements were <1 mm and the clinical ramifications were minimal and well within measurement error of ± 1 mm.[33,34] These improvements also may be attributed to the Hawthorne Effect, and the patients' slight improvement in homecare due to knowledge of participation in a clinical study.[35] In addition, these data confirm that clinically relevant recession on the mid-buccal surface did not occur, which may be an issue with full-flap surgery.

A major limitation of the study was poor plaque control in the recruited patients. Plaque was present on two-thirds of surfaces of experimental teeth at baseline. However, the PI used here focused on posterior interproximal sites on the experimental and adjacent posterior teeth, and any visible plaque on the explorer after passing over the interproximal tooth surfaces was counted as positive; these partial mouth scores likely inflated the plaque score compared with full-mouth measurements. The high supragingival plaque levels reported in the current study were similar to those found by Reinhardt et al.[36] using a similar method showing 56% to 68% explorer-detectable plaque levels across time points throughout a randomized clinical trial evaluating systemic sub-antimicrobial dose doxycycline. Greater reduction in PI may have resulted in better clinical outcomes and a reduction in the inflammatory markers present for both groups because it has been shown that EMD is less effective in sites with periodontal bacteria present.[37] In spite of the limitation on EMD, PR/RP improved CAL from a mean of ≈7.5 to 5.5 mm at 12 months, a clinically relevant result. The impact of PR/RP may overwhelm the impact of EMD in the PMT patients. A plaque index <35% is recommended for periodontal stability,[38] as renewed accumulation of plaque may result in recurrence of periodontitis including a significant further loss of attachment.[33] Twelve-month PI in the current study were slightly higher (43% to 55%), so efforts to improve future PI would be important.

EMD did not enhance the reduction of inflammatory measures BOP or IL-1β after 12 months. This is a similar finding to a previous study by Giannopoulou et al.,[39] who found that EMD did not affect the expression of inflammatory mediators in non-surgical treatment, including IL-1. However, the current study did see a significant reduction in IL-1β in the PR/RP + EMD group at 2-weeks post-therapy and a trend for reduction at 12-months post-therapy. It has been shown that EMD suppresses these proinflammatory cytokines.[40,41]

Clinical implications of this study support the use of PR/RP during periodontal maintenance appointments, with no additional benefit by adding EMD. The added procedure of PR/RP with the aid of microscopic visualization of a localized site can be easily incorporated into a periodontal

maintenance appointment with minimal additional time added to the dental practitioner's schedule. The hygienist could be responsible for many aspects of the procedure including local anesthesia and SRP with aid of enhanced visualization. The dentist could complete the papilla reflection in minimal time and the patient could have the entire procedure completed by adding <30 minutes to a standard periodontal maintenance appointment. Future studies will determine if different biologics and enhanced oral hygiene techniques are applicable as a beneficial adjunct to this procedure. Comparisons to other papilla preservation flaps are also warranted. However, the current clinical trial was able to show that localized SRP with enhanced visualization and papilla reflection had favorable clinical outcomes in non-healing 6- to 9-mm interproximal pockets in periodontal maintenance patients.

5 | CONCLUSIONS

Future studies will determine if different biologics are applicable as a beneficial adjunct to this procedure; however, the current clinical trial was able to show that localized SRP with enhanced visualization and papilla reflection had favorable clinical outcomes in persistent 6- to 9-mm interproximal pockets in periodontal maintenance patients.

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AUTHOR CONTRIBUTIONS

All authors have made substantial contributions to the concept and design of the study. Dr. Jasa, Dr. Gradoville, Dr. Christiansen, Dr. Payne, Dr. Reinhardt and Dr. Killeen have been involved in data collection and analysis. Dr. Jasa, Dr. Gradoville, Dr. Christiansen, Dr. Payne, Dr. Reinhardt and Dr. Killeen have been involved in data interpretation, drafting the manuscript and revising it critically and have given final approval of the version to be published.

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FACULTE D'ODONTOLOGIE

Épreuve de : Internat blanc 2021 (LCA) **Correcteur : Dr GARYGA Valentin**

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Question 4 :

Quel est l'objectif de l'étude ? Quels sont les critères de jugement ?

Question 5 :

Quels sont les critères de sélections des patients ? Proposez deux critères supplémentaires qui auraient pu être considérés, et justifiez brièvement vos propositions.

Question 6 :

Avez-vous des critiques concernant la manière dont se font l'évaluation de la profondeur de sondage (PPD) et de la hauteur d'os interproximale (IBH) ? Ceci peut-il avoir des conséquences sur les résultats de l'étude ? Faites une proposition pour améliorer la validité de la mesure de la PPD. De même pour l'IBH.

Question 7 :

L'étude présente-elle une puissance suffisante ? Justifiez.

Question 8 :

Les conclusions de l'étude vous surprennent-elles ? Sont-elles de nature à modifier votre pratique clinique ? Justifiez.

INSTRUCTIONS SUR LE COMPTAGE DES MOTS DU RESUME

1. Comptent comme un mot (une case) :

* un mot :

- simple ou composé avec ou sans tiret (exemple : globulines, gamma globulines,

α trypsine...) ; l'article (le, la, un, l'...) associé au mot doit être dans la même case

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* un nombre ou une expression chiffrée (m ± SD, $p < 0,05$, IC_{95}(a-b) ;

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* un acronyme accepté par le CNCI (quel que soit le nombre de lettres) (exemple : Sida) ;

* les abréviations acceptées par le CNCI (une case par abréviation, exemple : Se =

sensibilité = une case) ;

* les lettres utilisées isolément (α, β...)

2. Ne comptent pas séparément (doivent donc être associés dans une case) :

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* les signes conventionnels (>, <, ≥ ...) ;

* les guillemets ;

* les parenthèses ou crochets ;

* l'article (le, la, un, l'...) associé au mot ;

* les numéros ou lettres d'une énumération (accompagnés ou non d'une ponctuation

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* les unités associées à un nombre (ex : 18 mg, 172 ml/min.m^2, 26 m/s).

3. Comptent séparément (doivent être inscrits dans des cases séparées) tous les autres cas.

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