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**Intérêt d'une imagerie bucco-dentaire 3D (CBCT)
versus 2D (OPT) dans la prise en charge des patients
hospitalisés pour endocardite infectieuse : étude
préliminaire**

Ambroise Jagdev

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NANTES UNIVERSITÉ
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Intérêt d'une imagerie bucco-dentaire 3D (CBCT) versus 2D (OPT) dans la prise en charge des patients hospitalisés pour endocardite infectieuse : Étude préliminaire

THÈSE POUR LE DIPLOME D'ÉTAT DE DOCTEUR EN CHIRURGIE DENTAIRE

Présentée
et soutenue publiquement par

JAGDEV Ambroise

Le 15 septembre 2023 devant le jury ci-dessous

Président : Pr. Philippe LESCLOUS



Assesseur : Pr. Pierre CORRE

Assesseur : Pr. David BOUTOILLE

Assesseur : Dr. Jean-Philippe PERRIN

Assesseur : Dr. Alexandra CLOÛTRE

Directeur de thèse : Pr. Philippe LESCLOUS

	<u>Présidente</u> Pr. BERNAULT Carine
	<u>Doyen</u> Pr. SOUEIDAN Assem <u>Asseseurs</u> Pr GAUDIN Alexis Pr LE GUEHENNEC Laurent Pr LESCLOUS Philippe

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<u>Maitres de conférences des Universités - Praticiens Hospitaliers</u>	<u>Chef de Clinique des Universités - Assistant des Hôpitaux</u>
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Professeur des Universités – Praticien Hospitalier
Docteur de l'Université Paris Descartes, habilité à diriger les recherches
Département de Chirurgie Orale
Responsable de l'Unité fonctionnelle de Chirurgie Orale
Nantes Université/CHU de Nantes
INSERM U1229 RMeS

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Professeur des Universités - Praticien Hospitalier
Docteur de l'Université de Nantes, habilité à diriger les recherches
Clinique de Chirurgie Maxillo-Faciale et Stomatologie
Centre de Compétence Maladies Rares Fentes et Malformations faciales,
Syndromes de Pierre Robin, Maladies odontologiques rares
Nantes Université/CHU de Nantes
INSERM 1229 RMeS

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Docteur de l'Université de Nantes, habilité à diriger les recherches
Service des Maladies Infectieuses et Tropicales,
Nantes Université/CHU de Nantes
CIC INSERM 1413

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Praticien Hospitalier

Clinique de Chirurgie Maxillo-Faciale et Stomatologie

Centre de Compétence Maladies Rares Fentes et Malformations faciales,

Syndromes de Pierre Robin, Maladies odontologiques rares

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Maître de Conférences des Universités – Praticien Hospitalier
Docteure de Nantes Université
Cheffe du Département de Chirurgie Orale
Unité Fonctionnelle de Chirurgie Orale
Nantes Université/CHU de Nantes
INSERM U1229 RMeS

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ABBREVIATIONS

AHA : American Heart Association

CBCT : Cone Beam Computer Tomography

EI : Endocardite Infectieuse

ESC : European Society of Cardiology

FIB : Foyer Infectieux Buccaux

IE : Infective Endocarditis

OIF : Oral Infectious Foci

OPT : Orthopantomogramm

PCC : Predisposing Cardiac Condition

RCT : Randomized Controlled Trial

Introduction générale

L'endocardite infectieuse (EI), décrite pour la première fois par William Osler à la fin du XIXe siècle (1), reste une maladie infectieuse grave qui continue de causer une morbidité et une mortalité élevées. Dans les pays développés, en particulier en France, l'EI est une maladie rare (3 cas pour 100 000 habitants par an en moyenne ; 3 cas pour 1 000 habitants par an chez les personnes ayant des valves cardiaques prothétiques), mais grave (mortalité à l'hôpital et à 5 ans respectivement de 20 % et 40 %) et coûteuse (2). De plus, des études récentes ont identifié les patients ayant des antécédents d'EI comme étant les plus exposés à une récurrence d'EI, avec une incidence annuelle dépassant 10 000 pour 100 000 habitants (3)

La plupart des cas d'EI sont causés par des cocci à Gram positif qui proviennent de la peau, de la cavité buccale, du tractus gastro-intestinal ou urinaire. La porte d'entrée buccale est identifiée comme la deuxième la plus fréquente d'EI (en particulier l'EI streptococcique), chez environ 25 % à 30 % des patients atteints d'EI (4,5).

Il est également documenté depuis longtemps que les procédures dentaires invasives induisent des taux élevés de bactériémie et sont impliquées dans la pathogenèse de l'EI (6–8). Plus récemment, une mauvaise santé buccale et une bactériémie quotidienne liée aux activités quotidiennes (mastication, hygiène buccale, etc.) ont été identifiées comme étant également responsables de l'EI (6,7).

Des stratégies de prophylaxie de l'EI ont donc été proposées depuis de nombreuses années aux patients présentant des conditions cardiaques prédisposantes à l'EI (PCC+), tels que les patients ayant une valve cardiaque prothétique, des cardiopathies congénitales cyanogènes non opérées ou des antécédents d'EI, subissant des procédures invasives responsables de bactériémie ou concernant des mesures d'hygiène buccale et un suivi dentaire. Cette prophylaxie repose sur une stricte hygiène buccale, un suivi dentaire systématique tous les 6 mois et la prise d'antibiotiques une heure avant une procédure dentaire invasive (8)

Ainsi, la détection et la gestion précise des foyers infectieux buccaux (FIB) sont essentielles pour réduire les récurrences ou les réinfections d'EI. Dans ce contexte, des recommandations ont été établies depuis 1955, principalement sur la base d'avis d'experts (9). Toutes les recommandations actuelles encouragent la détection systématique des FIB et leur élimination chez les patients atteints d'EI, mais les modalités de dépistage et de gestion de ces FIB ne font pas consensus et/ou sont

incohérentes (8,10–12). En général, un examen buccal approfondi basé sur les symptômes cliniques et les plaintes des patients est obligatoire. Cet examen est recommandé d'être systématiquement complété par une radiographie conventionnelle bidimensionnelle (principalement un panoramique dentaire : OPT), non seulement pour évaluer les FIB avec des symptômes cliniques, mais aussi pour détecter des FIB asymptomatiques.

L'hygiène buccale est également un élément clé pour réduire le risque d'épisode d'EI, en particulier chez les patients PCC+ (13). Ainsi, ces patients PCC+ devraient être sensibilisés à l'importance des habitudes d'hygiène buccale et à un suivi dentaire régulier.

Cependant, cette approche recommandée semble assez limitée. En France, depuis la première promotion de cette approche en 1992, des enquêtes successives menées en 1999 et 2008 ont montré que l'incidence annuelle de l'EI était restée stable à 3,3 et 3,2 cas pour 100 000 habitants respectivement, suggérant l'absence de changement significatif (2,14). À noter que le nombre de cas induits par les streptocoques buccaux est également resté stable. Aux États-Unis et au Canada, l'American Heart Association (AHA) a récemment déclaré qu'il n'y avait pas d'augmentation, mais pas non plus de diminution de la fréquence ou de la mortalité de l'EI streptococcique du groupe viridans sur valve native après les directives AHA de 2007 recommandant le même examen buccal/OPT, l'hygiène buccale et suivi dentaire (15).

De plus, une récente étude française croisée comparant l'état dentaire cliniquement et l'évaluation de l'OPT chez les patients atteints d'EI avec un microorganisme causal oral ou non oral, n'a enregistré aucune différence entre les groupes, sauf une nécrose pulpaire (15). Dans cette étude, il a été estimé par modélisation que le manque d'hygiène buccale était le facteur prédominant contribuant au développement de l'EI streptococcique à germe oral. Cela suggère que l'examen buccal combiné à l'OPT n'est pas suffisamment sensible pour détecter les FIB asymptomatiques chez les patients atteints d'EI, les exposant ainsi à un risque élevé de récurrence ou de réinfection d'EI.

La tomographie volumique à faisceau conique (CBCT) peut surmonter certaines limites de l'OPT. Cette modalité d'imagerie hautement détaillée est actuellement considérée comme la technique 3D standard en radiologie dentaire et maxillo-faciale et est couramment utilisée dans la population générale (en dehors de la population des patients atteints d'EI) (16). Des preuves montrent que le CBCT a une meilleure

précision diagnostique que les radiographies conventionnelles, c'est-à-dire les radiographies rétroalvéolaire ou l'OPT, pour détecter les parodontites apicales, une source fréquente de FIB dans la population générale (sensibilité de 0,95 contre 0,56 et spécificité de 0,88 contre 0,78, respectivement) (17,18)

Pour toutes ces raisons, un groupe de travail multidisciplinaire français chargé de l'évaluation et de la gestion de l'état buccal chez les patients PCC+ a récemment suggéré l'utilisation systématique de la CBCT chez les patients atteints d'EI, une condition nécessitant une grande sensibilité pour la détection des FIB symptomatiques et asymptomatiques. Cependant, il s'agit seulement d'une déclaration d'experts.

Nous avons donc formulé l'hypothèse première que chez les patients hospitalisés pour une EI (patients atteints d'EI), l'exploration systématique par CBCT permettrait l'identification et la gestion d'un plus grand nombre de FIB que ceux détectés par l'OPT. Cela améliorerait donc l'état de santé buccal des patients atteints d'EI. À ce jour, aucune étude n'a été réalisée pour confirmer l'efficacité d'une approche par CBCT sur l'état de santé buccal des patients atteints d'EI. Deuxièmement, nous avons formulé l'hypothèse que chez les patients atteints d'EI (une population théoriquement consciente de la prophylaxie de l'EI), l'état de santé buccal, les habitudes d'hygiène orale et le suivi buccodentaire seraient plus conformes aux recommandations actuelles en matière de prévention de l'EI que chez les patients sans conditions cardiaques prédisposantes (PCCs-).

Pour tester ces hypothèses, nous avons réalisé une étude préliminaire pour étudier la faisabilité et la pertinence d'un tel protocole.

Si cette étude préliminaire s'avère pertinente, elle pourrait conduire à un essai contrôlé randomisé sur une population plus importante de patients atteints d'EI, ainsi qu'à une extrapolation potentielle des résultats à une population plus large de patients PCC+ en dehors du contexte de l'EI, en particulier les patients ayant des valves cardiaques prothétiques.

Il est important de souligner que la stratégie utilisée dans cette étude vise non seulement à éliminer le portail d'entrée de l'EI d'origine buccale (prophylaxie secondaire), mais aussi à éliminer un portail d'entrée potentiel chez les patients atteints d'EI d'origine non buccale pour prévenir les épisodes ultérieurs d'EI (prophylaxie primaire).

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3D imaging (Cone Beam Computed Tomography) versus 2D (OPT) in the oral management of patients hospitalized for infective endocarditis:
A preliminary study

Introduction

Infective endocarditis (IE), first described by William Osler at the end of the 19th century (1), remains a severe infectious disease which continues to cause high morbidity and mortality. In developed countries, in France in particular, IE is a rare (3/100,000/year overall; 3/1,000/year in individuals with prosthetic heart valves), but severe (in-hospital and 5-year mortality 20% and 40% respectively) and cost expensive disease (2). Furthermore, recent studies have identified patients with an history of IE as being at highest risk of IE recurrence, with an annual incidence exceeding 10.000/100.000 (3). Most cases of IE are caused by gram-positive cocci that originate from the skin, the oral cavity, or the gastrointestinal or urinary tracts. Non-oral portal of entry is predominant for IE, but the oral portal of entry is identified as the second most frequent source of IE (streptococcal IE in particular), in about 25% to 30% of the IE patients (4,5).

Oral hygiene is also a key point in reducing the risk of IE episode, in particular in patients with predisposing cardiac conditions (PCCs+) (16). As such, these PCCs+ patients should be educated on the importance of oral hygiene habits and regular orodental follow-up.

It is also documented since a long time that invasive dental procedures induce high rates of bacteremia and are involved in IE pathogenesis (6-8). More recently, poor oral status and everyday life bacteremia have been identified as being also responsible for IE because of subsequent bacteremia caused by daily activities (chewing, oral hygiene activities ...) (6,7).

Thus, detecting and managing accurately the oral infectious foci (OIF) is essential to reduce IE relapse or reinfection. In this context, guidelines have been established since 1955, mainly based on expert opinion (9). All the current guidelines promote systematic detection of OIF and their elimination in IE patients, but the modalities for screening and managing these OIF are not consensual and/or inconsistent (8,10–12). Generally, a thorough oral examination based upon clinical symptoms and patients' complaints is mandatory. This examination is recommended to be systematically completed with a two-dimensional conventional radiograph (mainly orthopantomogram: OPT) not only to assess OIF with clinical symptoms but also to detect asymptomatic OIF.

IE prophylaxis strategies have been therefore proposed for many years to PCCs+ patients (i.e., patients with prosthetic heart valve, cyanotic unrepaired congenital heart

diseases, previous history of IE) undergoing invasive procedure responsible for bacteremia or regarding oral hygiene measure and orodental follow-up in many countries (except noticeably in UK and in Sweden). This prophylaxis is based on strict oral hygiene, a systematic orodental follow-up every 6 months, and taking antibiotics in the hour preceding an invasive dental procedure (8).

Importantly, a recent French cross-over study comparing the orodental status clinically and OPT assessed of IE patients suggested that oral examination combined with OPT is not sensitive enough to detect asymptomatic OIF in IE patients, thus keeping them at high risk of IE relapse or reinfection.

Cone Beam Computed Tomography (CBCT) has better diagnostic accuracy than conventional radiographs, i.e., periapical radiographs or OPT for detecting apical periodontitis, a frequent source of OIF in the general population (sensitivity 0.95 vs. 0.56 and specificity 0.88 vs. 0.78, respectively) (17,18) . This highly detailed imaging modality is currently considered as the standard 3D technique in dental and maxillofacial radiology and widely used in the general population (outside an IE context) (16).

For all these reasons, a French multidisciplinary task force for the evaluation and management of oral status in PCCs+ patients has suggested recently the systematic use of CBCT for IE patients, a condition needing high sensitivity in the detection of symptomatic as asymptomatic OIF. However, this is only an expert statement.

We therefore hypothesized first, that in patients hospitalized for IE (IE patients), systematic exploration by CBCT would allow the identification and the management of a greater number of OIF than that detected by OPT. It would therefore improve oral health status of patients with IE. To date, no study was ever conducted to confirm the effectiveness of a CBCT approach on the oral health status in patients with IE. And second, we hypothesized that in IE patients (a population theoretically aware of IE prophylaxis), oral health status, oral hygiene habits and oral follow-up would be more in line with current guidelines about IE prevention than in patients with no predisposing cardiac conditions (PCCs-).

To test these hypotheses, we performed a preliminary study to investigate the feasibility and the relevance of such a protocol.

If relevant, this preliminary study could lead to a Randomized Controlled Trial (RCT) on a larger population of IE patients, and to potential extrapolation of the results to a

larger population of the PCCs+ patients but outside the context of IE, patients with prosthetic heart valves in particular.

Importantly, the strategy used in this study aims not only to remove the portal of entry of IE of oral origin (secondary prophylaxis) but also to remove a potential portal of entry in patients who suffer from IE of non-oral origin to prevent subsequent episodes of EI (primary prophylaxis).

Materials and Methods

Patients hospitalized for definite IE according to the 2015 European Society of Cardiology (ESC) classification (11), whatever the responsible microorganism and who fully meet the inclusion criteria were included.

Inclusion criteria were:

- Patients hospitalized for definite IE according to the 2015 ESC classification, whatever the responsible microorganism.
- Patients with a stable clinical state compatible with the performance of an OPT and a CBCT during his/her initial hospitalization for acute IE management.
- Patients over 18 years old.
- Patients affiliated to a Social Security or a health insurance scheme.
- Patients who have given informed consent to participate to the study

Non-inclusion criteria are:

- Medical contraindications to perform an OPT and a CBCT.
- Absence of microbiologic identification of the IE responsible microorganism.
- Patients under 18 years old.
- Pregnant or breastfeeding women.
- Patients unable to give informed consent to participate to the study (under trusteeship, guardianship and legal protection).
- Early eradication of OIF before this study.

This study was approved by an institutional review board, the Ethical Committee of Research in Tropical and Infectious Diseases (CER-MIT, n° 2019-0703).

In all IE patients included a thorough clinical orodental examination combined with an OPT and CBCT, were performed. In all IE patients, following parameters were recorded :

- Demographic data: gender and age.
- IE history and causative microorganism.
- The number of decayed, missing and filled teeth to assess dental status determining the DFMT index. This index is a well established key measure to estimate the global health oral status (19).
- The number of severe periodontitis tooth i.e., severe tooth mobility (lateral mobility \geq 1mm combined with axial mobility) and/ or alveolar bone loss of the inter-radicular furcation.
- If relevant, the number of periimplantitis sites i.e., dental implant mobility and/or suppuration and/or severe bone loss around the implant.
- Number and type of OIF discernible on imagery will be recorded using OPT and CBCT.
- Oral hygiene habits and oral follow-up using an already validated questionnaire (15). This questionnaire included questions about general IE characteristics as well as the IE episode the patient had experienced. It also included questions on patients' attitudes towards prophylaxis measures (frequency and duration of tooth-brushing, complementary dental hygiene habits, frequency of dental visit).

A personalized decision-making will be inferred and proposed to each patient.

Descriptive statistics were performed using Microsoft excel 365 (Microsoft Corporation). We calculated numbers and percentages for each variable, along with mean \pm standard deviation (SD). The data were compared using the non-parametric Student t-test. Differences were considered significant if $p < 0.05$.

Results

Characteristics of the population

A total of 20 patients hospitalized for IE according to the ESC 2015 classification were included in this study, 17 males and 3 females (sex ratio: 5.66) with an average age of 62.2 (\pm 19.2) years old, ranging from 22 to 86 years (Tableau I).

Eleven of these patients were priorly classified as IE PCCs+ because having a predisposing cardiac condition. They were an average of 70 (\pm 14.4) years old, ranging from 37 to 86 years. Three of them, (all males) had a previous IE history whereas the other 8 patients, (1 female and 7 males) had undergone aortic valve surgery with no

previous IE history. All these 11 patients were classified as IE PCCs+ for an average of 8 years. Nine patients (4 females and 5 males) had been hospitalized for a first IE episode without predisposing cardiac condition. They were considered as IE PCCs- patients. They were an average age of 52.2 (\pm 20.42) years old, ranging from 22 to 83 years. This subgroup of IE PCCs- patients was significantly younger than the subgroup of IE PCCs+ patients ($p < 0.05$).

IE causative microbiology

Fifty percent of the IE episodes were caused by an oral microorganism, mainly *Streptococcus sanguis* species, in 90% of such cases (Table I). In this subpopulation, IE PCCs+ patients were more numerous than IE PCCs- patients (70% vs 30%), but this difference was not significant.

Regarding the 50% IE episodes with non-oral causative microorganisms, half of them were *Streptococci*, 40% were *Staphylococci* and for 1 case, *Pasteurellaceae* was identified. In this subpopulation, no difference was recorded between the number of IE PCCs+ and IE PCCs- patients.

Demography			IE Risk		Bacteriology
Patients	Gender	Age	History of IE	High risk of IE	Microorganism involved
1	F	65	N	Y	<i>Streptococcus mutans</i> - O
2	M	48	N	N	<i>Staphylocoques aureus</i> - NO
3	M	86	N	Y	<i>Streptococcus agalactiae</i> - NO
4	F	56	N	N	<i>Streptococcus Gallolyticus</i> - NO
5	F	71	N	N	Methicillin-resistant <i>Staphylococcus aureus</i> - NO
6	M	32	N	N	<i>Staphylocoques aureus</i> - NO
7	F	74	N	N	<i>Streptocoque para sanguinaris</i> - O
8	M	65	Y	Y	<i>Streptococcus dysgalactiae</i> - NO
9	M	79	N	Y	<i>Streptococcus sanguis</i> - O
10	F	83	N	N	<i>Streptococcus sanguis</i> - O
11	M	72	N	Y	<i>Actinomyces odontolyticus</i> - O
12	M	82	N	Y	<i>Streptococcus infantarius</i> - NO
13	M	86	N	Y	<i>Streptococcus sanguis</i> - O
14	M	58	N	Y	<i>Streptococcus Gallolyticus</i> - NO
15	M	22	N	N	<i>Heamophilus Influenzae</i> - NO
16	M	37	Y	Y	<i>Streptococcus Pneumoniae</i> - O
17	M	69	N	Y	<i>Streptococcus sanguis</i> - O
18	M	75	Y	Y	<i>Streptococcus mitis</i> - O
19	M	42	N	N	Methicillin-sensitive <i>Staphylococcus aureus</i> - NO
20	M	42	N	N	<i>Streptococcus Oralis</i> - O
M=85% F=15%		Average = 62.2 years (\pm 19.2)	Y=15% N=85%	Y=55% N=45%	O=50% NO=50%

Table I: Characteristics of the studied population hospitalized for IE and IE causative microorganisms (F: female ; M: male ; Y: yes ; N: no ; O: oral ; NO: non oral)

Clinical examination

Each IE patient included in this study had 2.85 (\pm 4.42) decayed teeth, 5.30 (\pm 8.80) filled teeth and 11.85 (\pm 4.44) missing teeth. Therefore, the mean DFMT was 20 (\pm 9.07) (Table II).

Regarding PCCs, IE PCCs+ patients included in this study had 2.55 (\pm 5.35) decayed teeth, 5.64 (\pm 5.24) filled teeth and 13.55 (\pm 9.53) missing teeth. Therefore, the mean DFMT was 21.73 (\pm 8.52) in this IE PCCs+ subpopulation. IE PCCs- patients included in this study had 3.22 (\pm 3.23) decayed teeth, 4.89 (\pm 3.48) filled teeth and 9.78 (\pm 7.85) missing teeth. Therefore, the mean DFMT was 17.89 (\pm 9.77) in this IE PCCs- subpopulation. No significant difference was recorded between both subpopulations.

Regarding IE causative microorganism, IE patients induced by oral microorganisms had 1.60 (\pm 2.01) decayed teeth, 5.40 (\pm 5.38) filled teeth and 14.10 (\pm 9.49) missing teeth. Therefore, the mean DFMT was 21.10 (\pm 7.69). In case of non-oral causative microorganism, IE patients had 4.10 (\pm 5.82) decayed teeth, 5.20 (\pm 3.55) filled teeth and 9.60 (\pm 7.89) missing teeth. Therefore, the mean DFMT was 18.90 (\pm 10.57). No significant difference was recorded regarding the IE causative microorganisms.

Each IE patient included in this study had 1.55 (\pm 2.39) site with severe periodontitis (including mobile teeth with severe alveolar bone loss and inter-radicular furcation damage) (Table II). The mean site number with severe periodontitis was 1 (\pm 1.9) in PCCs+ and 2.2 (\pm 2.86) in PCC- IE patients included in this study. No significant difference was recorded between both subpopulations. Regarding the causative IE microorganism, this mean site number with severe periodontitis was 1.2 (\pm 1.99) in IE patients induced by oral microorganism and 1.9 (\pm 2.81) in IE patients due to non-oral causative microorganism. No significant difference was recorded regarding the IE causative microorganism.

Patients	D	M	F	DMF Total	Tooth with severe periodontitis
1	4	16	5	25	6
2	10	12	8	30	5
3	18	9	6	33	0
4	4	0	10	14	0
5	0	3	5	8	0
6	4	6	2	12	8
7	0	18	5	23	2
8	1	7	3	11	1
9	0	28	0	28	3
10	2	10	2	14	0
11	1	7	16	24	0
12	0	21	4	25	0
13	0	4	1	5	0
14	0	9	11	20	1
15	0	4	0	4	0
16	0	32	0	32	0
17	0	5	12	17	0
18	4	11	4	19	0
19	4	25	3	32	4
20	5	10	9	24	1
Average	2.85 (\pm 4.42)	11.85 (\pm 8.8)	5.3 (\pm 4.43)	20 (\pm 9.07)	1.55 (\pm 2.39)

Table II: DMFT Index and periodontal status of the studied population hospitalized for IE (D: Decayed ; M: Missing ; F: Filling)

OIF identification

The number of OIF identified in IE patients included in this study was significantly higher using CBCT than OPT: 5.95 (\pm 6.76) versus 5.15 (\pm 6.57) respectively ($p < 0.05$) (Table III, Figure 1). 0.8 (\pm 0.89) more OIF was detected using CBCT than OPT for each IE patient included in this study.

This number of identified OIF was significantly higher using CBCT than OPT identified in IE PCCs+ patients: 5.27 (\pm 7.22) versus 4.73 (\pm 6.81) respectively ($p < 0.05$), as in PCCs- IE patients: 6.78 (\pm 6.47) versus 5.57 (\pm 6.63), ($p < 0.05$). 0.55 (\pm 0.68) more OIF was detected using CBCT than OPT in PCCs+ IE patients whereas 1.11 (\pm 1.05) more OIF was detected using CBCT than OPT in PCCs- IE patient. Thus, significantly more OIF were detected using CBCT than OPT in the PCCs- subpopulation ($p < 0.05$). Regarding IE causative microorganism, the number of identified OIF was significantly higher using CBCT than OPT: 4.8 (\pm 6.08) versus 4.3 (\pm 6.20) in IE patients induced by oral causative microorganism ($p < 0.05$), and 7.10 (\pm 7.51) versus 6.0 (\pm 7.14) in IE patients due to non-oral causative microorganism, ($p < 0.05$). 0.5 (\pm 0.52) more OIF was detected using CBCT than OPT in IE patients induced by oral causative microorganism whereas 1.10 (\pm 1.10) more OIF was detected using CBCT than OPT in IE patients due to non-oral causative microorganism.

Patients	Number of OIF		
	CE+OPT	CE+CBCT	Additional OIF
1	4	5	1
2	11	12	1
3	13	15	2
4	4	7	3
5	1	1	0
6	3	5	2
7	1	2	1
8	0	0	0
9	4	4	0
10	21	21	0
11	2	3	1
12	2	2	0
13	0	0	0
14	22	23	1
15	0	0	0
16	0	0	0
17	4	4	0
18	1	2	1
19	4	6	2
20	6	7	1
Average	5.15 (±6.57)	5.95* (±6.76)	0.8 (±0.89)

Table III: Number of OIF according to the identification approaches: CE+OPT (clinical exam + orthopantomogram) and CE+CBCT (clinical exam + cone beam computer tomography); OIF: oral infectious foci; * different from CE+OPT, p<0.05

Regarding the type of identified OIF in the IE patients included in this study, only teeth with periapical periodontitis were significantly more identified using CBCT than OPT (33.30% vs 9.20% respectively, p< 0.05). For the other types of OIF, no significant difference was recorded (Figure 1).

This highlight was also recorded in the PCCs+ and PCCs- IE patient subpopulations (30.1% with CBCT vs 22.1% with OPT, p<0.05, and 51.4% with CBCT vs 24.8% with OPT, p<0.05, respectively). Regarding the IE causative microorganism, the same finding was recorded (36.8% with CBCT vs 24.2% with OPT in IE patients induced by oral causative microorganism, p<0.05, and 43.3% with CBCT vs 27.3% with OPT in IE patients due to non-oral microorganism, p<0.05, respectively).

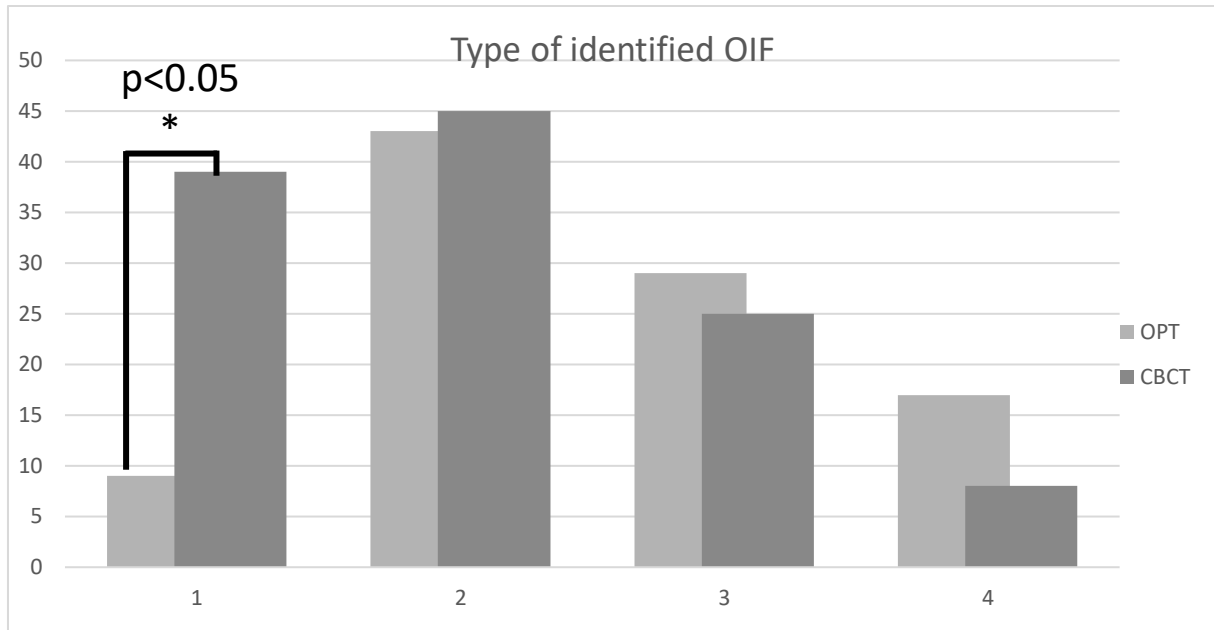


Figure 1: Types of OIF according to the diagnostic approaches: OPT (orthopantomogram) and CBCT (cone beam computer tomography); OIF: oral infectious foci; 1: Periapical periodontitis; 2: Periodontitis; 3: Non-restorable teeth; 4: Unsatisfactory root-filling treatment

Oral hygiene habits

Sixty percent of the IE patients included in this study reported brushing their teeth at least twice a day as currently recommended in guidelines (Table IV, Figure 2). This amount was 63.60% in the PCCs+ IE subpopulation and 44.40% in the IE PCCs- subpopulation. No statistical difference was recorded between both subpopulations.

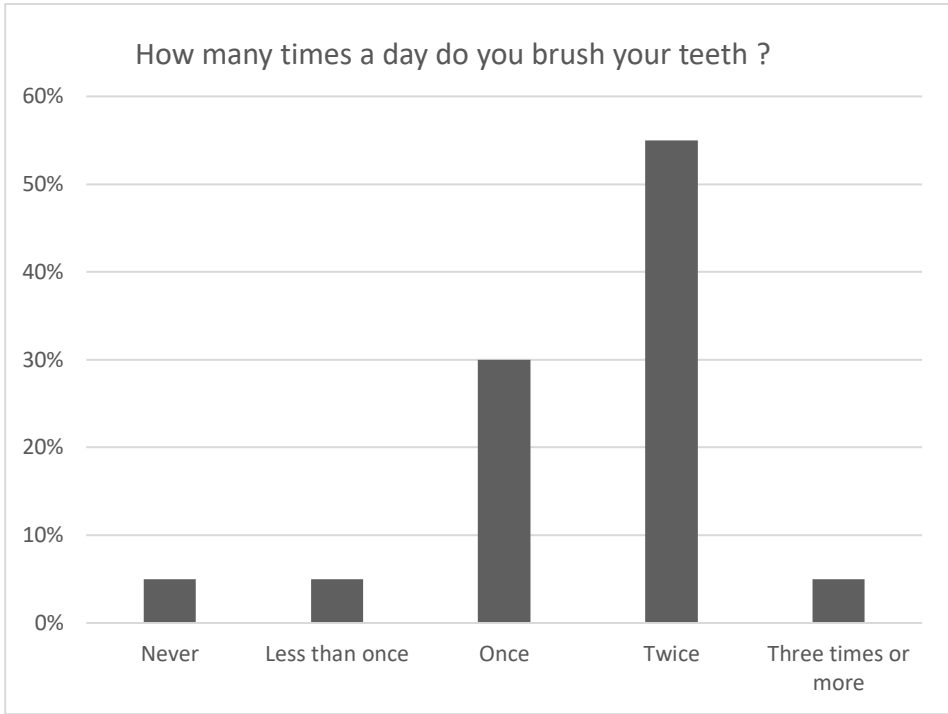


Figure 2: Daily toothbrushing frequency of the patients hospitalized for IE included in the study

Only 45% of the IE patients included in this study performed the minimal 2 minute-duration for a toothbrushing as currently recommended in guidelines (Table IV, Figure 3). This amount was 27.70% in the IE PCCs+ subpopulation and 55.55% in the IE PCCs- subpopulation. No statistical difference was recorded between both subpopulations.

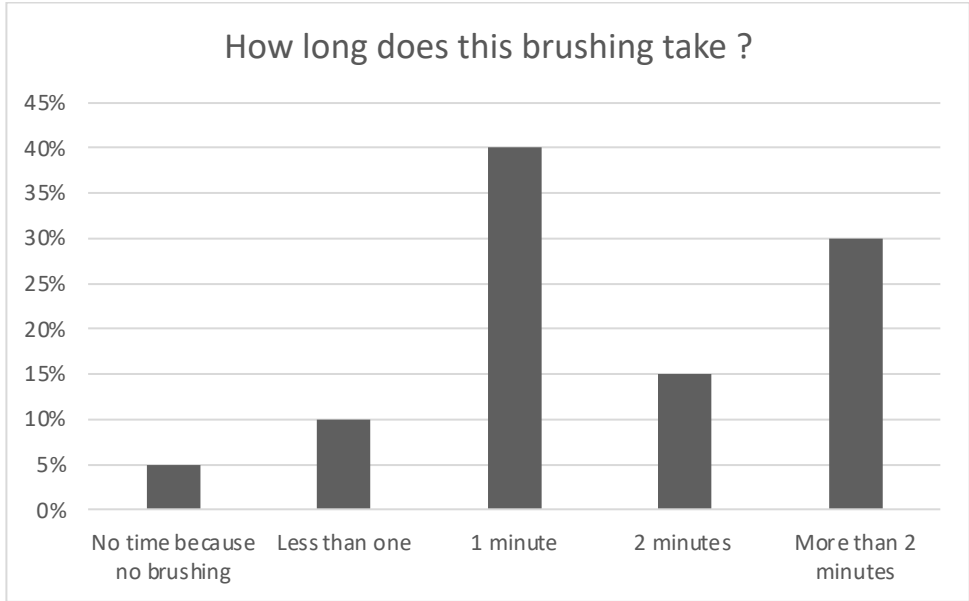


Figure 3: Tooth brushing duration of the patients hospitalized for IE included in the study

Ninety five percent of the IE patients included in this study reported no use of additional oral hygiene material (floss, interdental brush...) in their oral hygiene habits (Table IV). Seventy percent of the IE patients declared they were able to take care about their oral hygiene during the hospitalization for the IE episode (Table IV).

Oral follow-up

Only 35% of the IE patients included in this study declared to visit a dentist twice a year whereas 35% others declared to never do (Table IV, Figure 4). Only 45.50% of the PCCs+ IE patients included in this study declared to visit a dentist twice a year, as currently recommended in guidelines, whereas 22.20% of the PCCs- IE patients declared to do so. No statistical difference was recorded between both subpopulations.

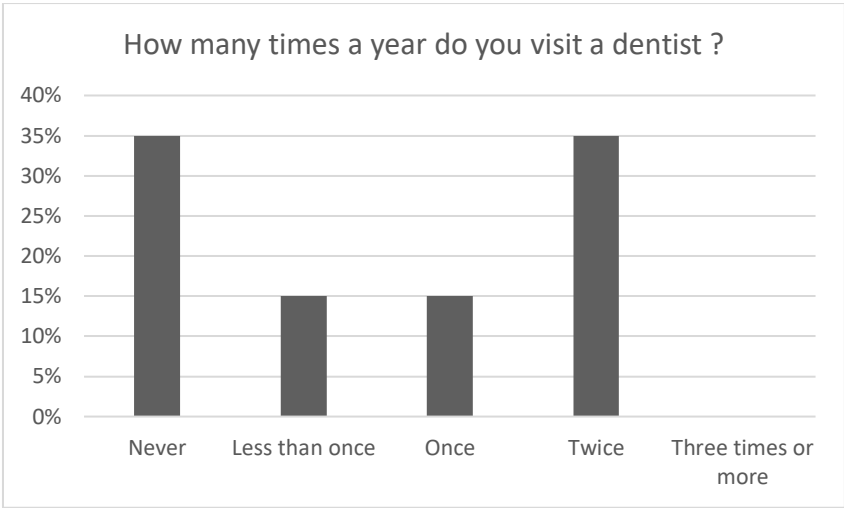


Figure 4: Frequency of visits in a dental setting for the patients hospitalized for IE included in the study

The main reasons for the last dental visit were a routine follow-up for 35%, a dental emergency for 30%, or a dental treatment for 30% of the IE patients included in this study (Table IV). Visits for dental emergency reasons appeared more numerous in PCCs- IE patients than in IE PCCs+ patients (44.40% vs 18.20% respectively), but no statistical difference was recorded.

Patients' knowledge of IE

For 65% of the IE patients included in this study, poor oral hygiene may lead to heart complications (Table IV). Even if this ratio appeared higher in PCCs+ IE patients than

in PCCs- IE patients (72.70% vs 55.60% respectively), no statistical difference was recorded.

In the 11 PCCs+ IE patients of this study, about 83% declared to have received detailed information on oral hygiene and IE risk, mostly by the cardiologist (Table IV, Figure 5). About 45% of these patients declared to have visited a dentist following the diagnosis of the IE PCC. For 73% of these patients, the dentist was aware of their cardiac condition. In this case, the vast majority of the dentists provided specific information about the importance of oral hygiene and oral follow-up (Table IV, Figure 6).

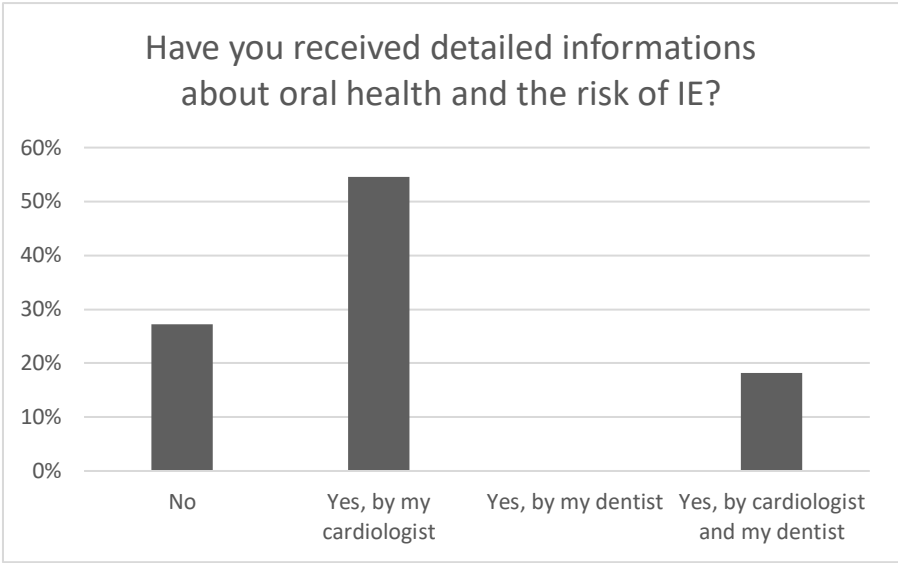


Figure 5: Information source of patients hospitalized for IE included in the study with predisposed cardiac conditions about oral health and IE risk

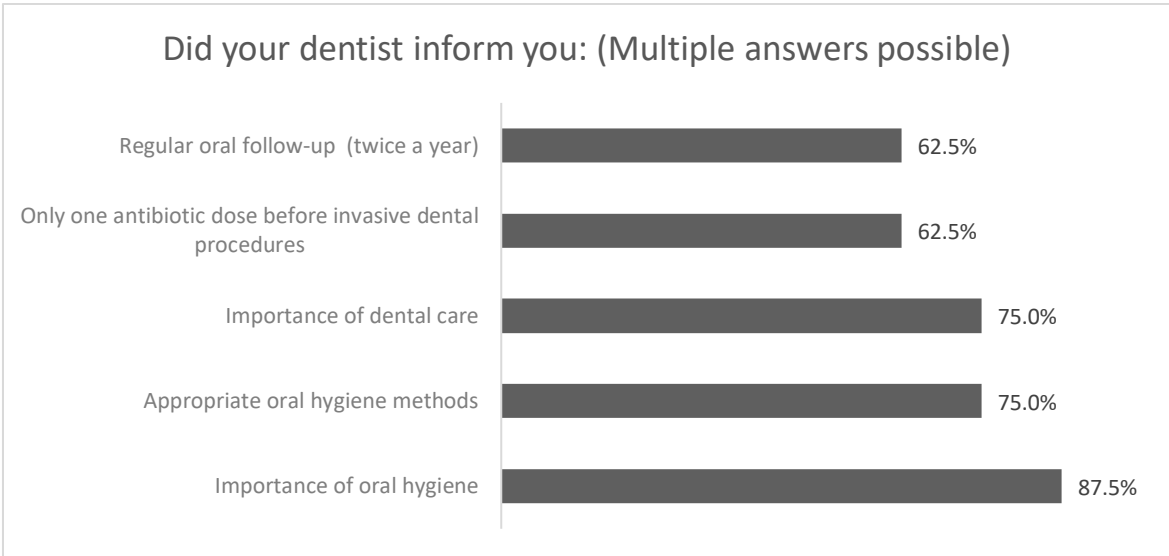


Figure 6: Specific information provided by the dentists to the patients hospitalized for IE included in the study with predisposed cardiac conditions

	Whole population		PCCs+		PCCs-	
	20		11		9	
	N	%	N	%	N	%
ORAL HYGIENE HABITS						
How many times a day do you brush your teeth ?						
Never	1	5	1	9.1	0	0.0
Less than once	1	5	0	0.0	1	11.1
Once	6	30	3	27.3	4	44.4
Twice	11	55	7	63.6	3	33.3
Three times or more	1	5	0	0.0	1	11.1
How long does this brushing take (in minutes)?						
No brushing	1	5	1	9.1	0	0.0
Less than one minute	2	10	0	0.0	2	22.2
1 minute	8	40	7	63.6	2	22.2
2 minutes	3	15	2	18.2	1	11.1
More than 2 minutes	6	30	1	9.1	4	44.4
Do you use any additional material to brush your teeth (floss, interdental brush, etc.)?						
Never	19	95	11	100	8	88.9
Once a month	1	5	0	0.0	1	11.1
Today, you are hospitalized: are you able to maintain your oral hygiene properly?						
Yes	14	70	10	90.9	4	44.4
No	6	30	1	9.1	5	55.6
ORAL FOLLOW-UP						
How many times a year do you visit a dentist?						
Never	7	35	2	18.2	5	55.6
Less than once	3	15	1	9.1	2	22.2
Once	3	15	3	27.3	0	0.0
Twice	7	35	5	45.4	2	22.2
Twice or more	0	0	0	0.0	0	0.0
What was the reason for your last visit to the dentist?						
Dental emergency	6	30	2	18.2	4	44.4
Dental treatment	6	30	4	36.4	2	22.2
Routine follow-up	7	35	4	36.4	3	33.3
I don't remember	1	5	1	9.1	0	0.0
AWARENESS OF THE IMPORTANCE OF ORAL HEALTH						
In your opinion, can a poor oral hygiene lead to heart complications ?						
Yes	13	65	8	72.7	5	55.6
No	2	10	1	9.1	1	11.1
I don't know	5	25	2	18.2	3	33.3
Are you aware of the link between oral health and heart disease?						
Yes	10	50	7	63.6	3	33.3
No	6	30	2	18.2	4	44.4
Yes, but I don't feel sufficiently informed	4	20	2	18.2	2	22.2
PCCs+ IE PATIENTS						
Do you have a cardioprevention card?						
Yes, my dentist has seen it			3	27.3		
Yes, but my dentist hasn't seen it			1	9.1		
No			7	63.6		
Have you received detailed information about oral health and the risk of IE?						
No			3	27.3		
Yes, by my cardiologist			6	54.5		
Yes, by my dentist			2	18.2		
Was you recommended to go to a dentist after being diagnosed with a high risk of IE?						
No			5	45.5		
Yes, but I didn't			1	9.1		
Yes and I did			5	45.5		
Is your dentist aware of your cardiac condition?						
Yes			8	72.7		
No			3	27.3		

Table IV: Oral hygiene and oral follow-up habits of the patients hospitalized for IE included in the study (PCCs: Predisposing cardiac conditions; N: number)

Adherence to the IE prophylaxis guidelines

PCCs+ IE patients reporting brushing their teeth at least twice a day during at least two minutes and declaring to visit a dentist at least twice a year were considered as fully adherent to the current prophylaxis guidelines.

Only one patient of the 11 PCCs+ IE patients included in this study fully complied with the current guidelines (9.09%).

Discussion

This preliminary study ascertains the feasibility of our research protocol and its relevance. This could lead to a RCT on a larger population of IE patients.

In this study, we assessed simultaneously the detection of OIF in patients hospitalized for IE comparing a conventional imagery technique, OPT, with a 3-dimensional technique, CBCT, and patients' background characteristics, orodental status, oral hygiene habits, oral follow-up and IE knowledge. In a crucial context of patients hospitalized for IE, we evidenced that OIF detection was more accurate than OPT. We also showed the poor adherence of these IE patients to current guidelines and recommendations for IE prophylaxis regarding their orodental status, their hygiene habits and oral follow-up. The lack of difference between PCCs+ and PCCs- subpopulations regarding these items highlights the huge need to strengthen knowledge and implementation of these guidelines.

In this study, the average age of the population (62.2 years old) was quite similar to the age of the population investigated by Revest et al. (20) (62.3 years old). This is also quite similar to the average age in the study of Duval et al., 60.8 years old in an IE PCCs+ population (15). But this is higher than in the study of Celestin et al., 56 years in a population hospitalized for an IE episode about 39 months before (13). It was also a single-center study but enrolling much more IE patients, 98 versus 20 in our study. In our study, the age of the IE PCCs- patients was significantly younger than this of the IE PCCs+ patients. Regarding Table 1, we can see that in 6/9 of the IE PCC- patients, IE causative microorganism was of non-oral origin. This may reflect a higher rate of tricuspid valve IE seen more in a younger population of intravenous drug users. Male patients represent 85% of patients in our study, more than the 74% found in the study of Revest et al. (20), but close to the rate recorded in the studies of Duval et al., 80% of a PCCs+ population (15), and of Celestin et al., 78.6% of an IE population (13). 15% of the patients included in our study had a previous episode of IE. This is about two-fold more than the 8-9% rate of in the study of Duval et al. (15), or the 7.1% rate reported in the study of Celestin et al. (13). This can be due to the small sample size of our study, probably not representative of the general IE patient population in France. 55% of the IE patients of our study were PCCs+, close to values recorded in other recent French studies by Duval et al. and Moby et al. (53.6% and 53.4% respectively) (15,21).

The high prevalence of oral IE causative microorganisms, 50%, recorded in our study is much more higher than those reported in other studies about IE general French populations, ranging from 18.7% to 39.4% (13,15,22). We cannot exclude a bias in the IE patient recruitment. Indeed, as this preliminary study was conducted by dentists, infectiologists recruiting these IE patients may unconsciously tend to select patients with IE of oral origin. Moreover, only valid IE patients hospitalized in the infectious disease setting were recruited for this preliminary study. It was not the most severely affected IE patients hospitalized in the emergency care setting of cardiology. We don't know the microbiological aspect of these severe IE patients. Therefore, a bias in the selection of the IE patients of this study could be possible.

It is of interest to underline that focusing on PCCs+ population, this rate increases to 70% in our study, much more than in another study in a similar population, 44.6% (21). But once again, it may reflect a bias in the selection of the IE patients of this preliminary study. In the PCCs- IE population, oral pathogens were more seldomly involved, in similar proportions than in the study of Moby et al. (21), 30% versus 33.6% respectively.

Regarding the DMFT index, each IE patient included in this study had on average 2.85 decayed teeth, 5.30 filled teeth and 11.85 missing teeth so the mean DFMT was 20. This is much more than the mean DFMT of a general French adult general population 14.6 (1.2 decayed teeth, 3.0 missing teeth and 10.4 filled teeth) (23). But these values were recorded in a younger adult population, 35 to 44 years old, than the 62.2 years old population of our study. And it is already reported that the mean DFMT index increases with age in a general population (24). However, it cannot be excluded that in a particular population, i.e. IE population, this DFMT index is higher than in a general population.

Only one study reported this DFMT index in an IE population (21). In a more important population, 216 IE patients, mean DFMT was 15.2 ± 7.6 , and probably not significantly different than the mean DFMT reported in our study, 20 ± 9.07 . This lack of significant difference was also illustrated regarding detailed scores of the DFMT indices, 2.5 ± 3.6 decayed teeth in the study of Moby et al. versus 2.85 ± 4.42 in our study, 5.1 ± 4.9 filled teeth versus 5.30 ± 8.80 and 8.0 ± 7.9 versus 11.85 ± 4.44 missing teeth (17).

Same profiles and lack of difference were recorded regarding DFMT indices and their detailed constitutive items in PCCs+ and PCCs- IE subpopulations.

This lack of difference regarding DFMT indices between both populations is questionable since the PCCs+ subpopulation is supposed to be aware about the importance of oral hygiene in IE onset.

This study supports the results of existing literature evidencing that CBCT is more effective for detecting intraosseous OIF compared to other imaging modalities such as OPT or periapical radiographs in a general population (14,21). This is of huge importance regarding apical periodontitis in particular, a frequent underdiagnosed source of OIF for which superiority in sensitivity and specificity for CBCT was evidenced (sensitivity 0.95 vs. 0.56 and specificity 0.88 vs. 0.78, respectively) (25).

Our study evidenced for the first time that in an IE population, 0.8 (\pm 0.89) more OIF was detected using CBCT than OPT for each patient included. This difference is significant in the whole population of this study, in the PCCs+ as in the PCCs- subpopulations. This is a key point of our study because removal of these supplemental OIF detected with CBCT could have a potential impact on IE recurrence. Regarding more specifically teeth with apical periodontitis, our study sustains the higher ability to detect such OIF using CBCT versus OPT. Interestingly, significantly more OIF were detected using CBCT than OPT in the PCCs- subpopulation. It could be suggested that this subpopulation is not aware about the potential link between orodental health and IE onset. But it is questionable since DFMT were not significantly different between PCCs- and PCCs+ patients.

Interestingly, the most frequent type of OIF recorded in this study is periodontitis whatever the imaging technique used, 43.90% using OPT and 38.50% using CBCT. To our knowledge, only 2 studies investigated such periodontal OIF using standard imagery reporting quite similar values, 31.8% for Duval et al. (15), and 32.10% for Moby et al. (21). Despite quite lower than this recorded in our study, this rate is probably not significantly different. This is of huge importance because this type of OIF is poorly investigated in PCCs+ or IE patients and the bacterial flora related to this oral disease is potentially incriminated in IE onset. Moreover, this kind of OIF frequently results from poor oral hygiene habits as illustrated in our study.

Sixty percent of the IE patients included in our study declared brushing their teeth at least twice a day as currently recommended in guidelines. This is in accordance with other studies about French IE populations, 54.7% for Duval et al. (15), and 55% for Moby et al. (21), but less than this reported by Celestin et al., 67.3% (13). In a more specific PCC+ child population, with congenital heart disease, more than 80% declared

brushing their teeth at least twice a day (26). This high rate could reflect the huge role of the parents of these children in their dental education.

No statistical difference was recorded between PCCs+ and PCCs- subpopulations in our study as in the only one investigating this criterion (21). This could be in line with the lack of difference regarding DFMT index between both subpopulations. For an adequate efficacy, the recommended duration of a tooth brushing is 2 minutes (8). For the first time, the duration of a tooth brushing was investigated in an IE population as a minimal 2 minute-duration is recommended for better efficacy (8). Only 45% of the IE patients included in this study performed this minimal 2 minute-duration for a toothbrushing. And no statistical difference was recorded between PCCs+ and PCCs- subpopulations. The poor oral hygiene habits of this IE population is in line with its poor oral condition whatever the previous risk of IE, i.e. in PCCs+ and PCCs- subpopulations.

These poor oral hygiene habits are key points as the PCCs+ subpopulation is supposed to be aware of the importance of oral hygiene as measure to prevent IE. As it is essential to decrease the occurrence of spontaneous bacteremia at risk of inducing IE, poor hygiene habits is associated with definite oral streptococcal IE (15). That means that this subpopulation is not fully adherent to oral IE prophylaxis guidelines and that adherence to these guidelines has to be strengthened. This poor adherence may be explained in part by the existence of symptoms of depression reported in patients hospitalized for IE (13).

Only 45.4% of the PCCs+ IE patients included in this study declared to visit a dentist twice a year as currently recommended and 22% of the PCCs- IE patients (27). This is the first time to our knowledge that this item is investigated in an IE population. Another study reported that 56.1% of patients with previous IE declared visiting the dentists at least once a year (13). But how many really visited their dentists on a twice a year basis? This poor amount reflects once again the poor adherence to current guidelines and recommendations for PCC+ patients. This could also reflect the poor accessibility to a dentist in France (28).

Another original finding of our study is the reason for which the IE patients included visited their dentists for the last time. Visits for dental emergency reasons appeared more numerous in PCCs- IE patients than in IE PCCs+ patients (44.40% vs 18.20% respectively). Even if no statistical difference was recorded, this result is in line with

the frequency of yearly dental visit, the more patient regularly visit the dentist, the less it is for emergency reasons.

Sixty-five percent of the IE patients included in this study correctly identified that poor oral hygiene may lead to heart complications. This is less than the 87.7% reported in the study of Celestin et al. (13). But difference between the 2 studies may be not significant since the sample size of our study is quite limited.

It is worrying to see that only 50% of the IE patients of our study were aware of the link between oral health and heart diseases while 30% were not and 20% stated that their information about this link was inadequate. This results are in accordance with those recorded in a more specific PCC+ child population with congenital heart disease (26). These results highlight the absolute necessity to educate correctly affected patients to the importance of such a link and what it implies in term of oral hygiene and follow-up. The earlier and the more clearly that this information is passed on to the patients at high risk of IE, the better will be their oral and general quality of life and the lower their individual risk for IE (29). This calls for a more structured follow-up of patients with high risk of IE in an interdisciplinary team of dentists and cardiologists. Hospitalization time for IE is also a good time to educate patient to the importance of oral hygiene and follow-up and furthermore to avoid IE recurrences.

Cardiologists and dentists are in first line because they guide and steer education and awareness about the prevention of dental illnesses in PCC+ patients. But priorly, they have to be educated themselves to this importance. It is not normal that 45% of IE PCCs+ patients included in our study declared not to have consulted a dentist after the PCC+ diagnosis and that only 72.7% of patients having a dentist declared he was aware of their cardiac condition. These findings also underline the need for better disease-specific patient information. Moreover, dentists and cardiologists should be trained more frequently concerning the IE risk of some predisposing cardiac conditions and the importance of some potent pathogenic factors (29).

Only 9.09% of the PCCs+ IE patients of this study reporting brushing their teeth at least twice a day during at least two minutes and declaring to visit a dentist at least twice a year were considered as fully adherent to the current prophylaxis guidelines. In the study of Celestin et al. 40.8% of the IE patients were considered adherent to oral prophylaxis guidelines (13). But these authors have a more extended definition of the fully adherence than ours as they considered fully adherent IE patients declaring

brushing their teeth at least twice a day and going to the dentist at least once a year. Using the same method, 54,5% of the IE patients of our study fulfilled the criteria.

This preliminary study has unavoidable drawbacks. The first is the small sample size of 20 IE patients. This is due to the preliminary nature of this study, so that no relevant conclusions can be made. Anyway, this preliminary study was first performed to test the protocol for a future multicenter randomized clinical trial.

Second, it is a monocentric study involving only one observer for IE patients and afferent imageries, OPT and CBCT. So, the findings may not reflect the heterogeneity of a national larger IE population aspects (cultural, educational, economical, dietary, ...) and of a panel of different investigators even if priorly calibrated.

Third, some biases in the selection of IE patients could have been made since they were selected by infectiologists. Therefore, they could have unconsciously selected the patients by favoring the oral microbiology of IE origin. Moreover, only IE patients hospitalized in one infectious disease setting were recruited for this preliminary study. It was not the most severely affected IE patients hospitalized in an emergency care setting of cardiology. So, these findings cannot be extrapolated to a larger national population of IE patients.

Fourth, assessment of oral hygiene habits, oral follow-up and patient's knowledge of IE was based on self-reported data through a dedicated questionnaire. Self-reported data can be subject to recall bias and may not accurately reflect the actual behavior or practices of the IE patients included in this preliminary study.

Conclusions

This preliminary study ascertains the feasibility of the research protocol and its relevance since promising results were recorded. It was the objective of this study.

As others, our study highlighted the poor orodental status of IE patients, their poor oral hygiene habits and follow-up, the poor adherence to current guidelines on IE prophylaxis, and their poor implementation. But our study is the first to evidence the accuracy of CBCT in such patient to detect significantly more OIF than conventional imagery and thus, potentially impact the decision making to eradicate them (30). While PCCs+ IE patients were expected to have better orodental status and better adherence to current guidelines, the lack of difference with PCCs- IE patients regarding these criteria is worrying. Further interventions should be implemented to improve oral

health, oral hygiene and oral follow-up not only with patients but also with cardiologists and dentists.

This leads to a RCT on a larger population of IE patients, and to potential extrapolation of the results to a larger population of the PCCs+ patients but outside the context of IE.

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Conclusion générale

L'objectif de cette étude préliminaire a été atteint, permettant de vérifier la faisabilité du protocole de recherche et sa pertinence, étant donné que des résultats prometteurs ont été montrés. Comme d'autres études, la nôtre a souligné le mauvais état buccodentaire des patients atteints d'EI, leurs mauvaises habitudes d'hygiène orale et leur suivi insuffisant, leur faible adhésion aux recommandations actuelles sur la prophylaxie de l'EI, ainsi que leur mise en œuvre insatisfaisante. Cependant, notre étude est la première à démontrer la précision du CBCT chez de tels patients pour détecter significativement plus de FIB que les techniques d'imagerie conventionnelles, ce qui pourrait avoir un impact sur la prise de décision pour les éradiquer. Nous nous attendions à ce que les patients atteints d'EI avec des PCCs+ aient un meilleur état buccodentaire et une meilleure adhérence aux recommandations actuelles, l'absence de différence avec les patients atteints d'EI avec des PCCs- concernant ces critères est préoccupante. Des interventions supplémentaires devraient être mises en place pour améliorer la santé buccale, l'hygiène orale et le suivi buccodentaire, non seulement chez les patients, mais aussi chez les cardiologues et les dentistes.

Cela conduit à un essai contrôlé randomisé sur une plus grande population de patients atteints d'EI, ainsi qu'à une extrapolation potentielle des résultats à une population plus large de patients PCCs+ en dehors du contexte de l'EI.

Annexe

Résultats appel d'offre PHRC National 2023

PHRC sélectionné (PHRC-22-0013) : Projet très prioritaire financé

The screenshot shows a web application interface for 'innovarc.fr'. At the top, there is a navigation bar with the user name 'Philippe Lesclous', a language dropdown set to 'Français', and a 'Déconnexion' link. Below this is a search bar with the placeholder text 'Rechercher un dossier'. The main content area features a 'Filtrer les dossiers' section with three input fields: 'Acronyme programme', 'N° Dossier', and 'Année' (set to '2022'). A 'Rôle' dropdown menu is open, showing 'Porteur de projet' and 'Délégué' as options. A blue 'Filtrer' button is positioned below the filters. Below the filter section is a 'Liste des dossiers' section. It includes a 'Afficher' dropdown set to '100' and the text 'éléments'. A table displays the search results with the following columns: 'Acronyme', 'Année', 'N° Dossier', 'Statut dossier', 'Rôle', 'Statut expertise', 'Prénom du porteur de projet', 'Nom du porteur de projet', and 'Action'. The table contains one row for 'PHRC' in '2022' with dossier number 'PHRC-22-0013', status 'Très prioritaire financé', role 'Porteur de projet', and project lead 'Philippe Lesclous'. An 'Action' button with an eye icon is visible in the last column. At the bottom of the table, it indicates 'Affichage de l'élément 1 à 1 sur 1 éléments (filtré de 6,114 éléments au total)' and includes navigation buttons for 'Précédent', '1', and 'Suivant'.

Rechercher un dossier

Philippe Lesclous Français Déconnexion

Filtrer les dossiers

Acronyme programme N° Dossier Rôle

Année

Porteur de projet x

Délégué x

Filtrer

Liste des dossiers

Afficher 100 éléments

Acronyme	Année	N° Dossier	Statut dossier	Rôle	Statut expertise	Prénom du porteur de projet	Nom du porteur de projet	Action
PHRC	2022	PHRC-22-0013	Très prioritaire financé	Porteur de projet		Philippe	Lesclous	

Affichage de l'élément 1 à 1 sur 1 éléments (filtré de 6,114 éléments au total)

Précédent 1 Suivant

JAGDEV (Ambroise) : Intérêt d'une imagerie bucco-dentaire 3D (CBCT) versus 2D (OPT) dans la prise en charge des patients hospitalisés pour endocardite infectieuse : Étude préliminaire (Thèse Chir. Dent. ; Nantes ; 2023)

L'endocardite infectieuse (EI) est une affection grave nécessitant un diagnostic précis et un traitement efficace. Cette étude préliminaire avait pour objectif d'évaluer la nécessité de l'imagerie tridimensionnelle par tomodensitométrie à faisceau conique (CBCT) par rapport à l'orthopantomogramme (OPT) chez les patients hospitalisés pour une EI. L'étude comprenait 20 patients atteints d'EI selon la classification de l'ESC 2015. L'âge moyen des patients était de 62,2 ans, avec une prédominance masculine (17 hommes et 3 femmes). Onze patients présentaient une condition cardiaque prédisposante (EI PCCs+), tandis que neuf patients ne présentaient aucune condition cardiaque prédisposante (EI PCCs-).

L'analyse microbiologique a révélé que 50 % des épisodes d'EI étaient causés par des microorganismes oraux, principalement l'espèce *Streptococcus sanguis*. Les 50 % restants étaient attribués à des microorganismes causatifs non oraux, comprenant des streptocoques, des staphylocoques et des Pasteurellaceae. Aucune différence significative n'a été observée entre les patients EI PCCs+ et EI PCCs- en termes de microbiologie causative.

Les résultats de l'examen clinique ont indiqué que tous les patients atteints d'EI présentaient un nombre important de dents cariées, obturées et manquantes. Aucune différence significative n'a été observée dans les paramètres dentaires entre les patients EI PCCs+ et EI PCCs-. Une parodontite sévère a été observée dans un nombre limité de sites, sans variation significative entre les deux sous-populations ou en fonction du microorganisme causatif.

Dans l'évaluation des foyers infectieux oraux (OIF), l'imagerie CBCT s'est avérée supérieure à l'OPT, détectant un nombre significativement plus élevé de OIF chez les patients atteints d'EI. Cette supériorité était évidente tant dans les sous-populations EI PCCs+ et EI PCCs- que chez les patients présentant des microorganismes causatifs oraux et non oraux. Plus spécifiquement, le CBCT a identifié un plus grand nombre de dents atteintes de parodontite périapicale par rapport à l'OPT.

Les habitudes d'hygiène buccale et le suivi bucco-dentaire ont été évaluées, révélant une adhésion insuffisante aux recommandations. Seulement 60 % des patients atteints d'EI ont déclaré se brosser les dents deux fois par jour, et seulement 45 % ont respecté la durée recommandée de deux minutes pour le brossage des dents. De plus, seuls 35 % des patients ont consulté un dentiste deux fois par an, comme le suggèrent les recommandations. 65 % des participants ont déclaré être conscients du lien entre une mauvaise hygiène buccale et les complications cardiaques.

En conclusion, cette étude préliminaire met en évidence la nécessité de l'imagerie 3D par CBCT par rapport à l'OPT pour la détection des OIF chez les patients hospitalisés pour une EI. De plus, elle révèle une adhésion insuffisante aux pratiques d'hygiène buccale et aux recommandations de prophylaxie de l'EI. Des recherches supplémentaires sont nécessaires pour valider ces résultats et explorer leurs implications pour la prise en charge des patients atteints d'EI.

RUBRIQUE DE CLASSEMENT : PATHOLOGIE BUCCALE ET PÉRI-BUCCALE

MOTS CLEFS MESH : Infective Endocarditis, Endocardite Infectieuse, Oral Hygiene, Hygiène Orale Health Behavior

Président : Pr. Philippe LESCLOUS

Assesseur : Pr. Pierre CORRE

Assesseur : Pr. David BOUTOILLE

Assesseur : Dr. Jean-Philippe PERRIN

Assesseur : Dr. Alexandra CLOÛTE

Directeur de thèse : Pr. Philippe LESCLOUS