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Cause of Bilateral Pulsatile Tinnitus

Highlights

Covid-19 Quarantine and Dental Care

Maxillary Sinus Membrane Advancement

Discovering Thoughts, Inventing Future

VOLUME 23 ISSUE 1 VERSION 1.0

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Covid-19 Quarantine and Dental Care: Patterns for Change

By Niccolo Caldararo
San Francisco State University

Abstract- *Introduction:* Significant time and money are spent on dental visits under normal conditions. The Covid-19 pandemic has placed a stop to these regimes. The consequences of this has been shown mainly in increased emergency care, however, little is known of the effect on the general population and how well oral care and the natural ability of teeth and the immune system have worked to preserve dental health.

Materials & Methods: Reference to reports in the media on oral health and dental visits are analyzed as are the dental literature for scientific foundations of treatment and pathology.

Principal Results: Current reduction of visits to dental professionals by both adults and children provides a unique opportunity to study healing of teeth in a natural context.

Conclusions: Research should be organized and directed to investigate the frequency of caries and natural healing in populations across socio-economic groups to determine potential changed in dental regimes of care and treatment.

Keywords: *dental care, caries, restorations, oral health, genetics.*

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Keywords: dental care, caries, restorations, oral health, genetics.

I. Introduction

The Covid-19 pandemic has changed many of the daily routines of the average person. One of these is the reduction in dental care. While dentists have reported more stress related dental problems during the pandemic, the CareQuest Institute for Oral Health found that some 6 million adults had lost dental insurance, which indicates a larger number of dependents also lost covered care. More than 1 in 10 Americans surveyed had avoided getting care due to the cost, lack of insurance or fear of exposure to Covid-19 or a combination of factors. (Tingley, 2021).

A press release by the FDI World Dental Federation dated March 18th 2021, cited a number of dental professionals whose practice indicated an increase of dental emergencies as well as other basic dental pathologies. No scientific studies are available to support this assertion, but it does seem likely. Data collected by the AARP (Stepko, 2021) suggested that cavities and periodontal gum disease was up significantly. This was partly blamed on a change in diet to sugary foods and drink and to lax dental care related to job and life changes brought on by the quarantine. One published study in Germany (Al-Masri, et al., 2021) found a 45% increase in emergency needed care in 2020.

With this information in mind, and no specific study data of if there has been a over all increase in cavities within the known factors of change of diet or loss of regular care (dental cleanings, scaling, fluoride etc.), it will be of interest to see if general trends can be extracted from care data after treatment resumes to normal levels.

II. Natural Response of the Tooth

There are a number of considerations that this information could enlighten health care professionals. It is known that under normal use teeth can repair themselves under both poor care and a range of diets. It is well established that arrested caries is a fairly common phenomenon (Shafer, et al., 1969), the infected tooth attempts to wall off the attack and electron microscope images can show dentinal tubules filled with dead bacteria and the progress started by "pioneer bacteria" arrested at the meridian of proteolytic forms. While some absorption of bone can result from infection or trauma, the defensive capacity of the oral tissues seems to have a certain degree of success.

There has been little research on this point and there are concerns that the lack of scientific evidence looms over dental procedures in general (Jabr, 2019). Some dentists argue that a lack of funding has stalled scientific research (Dhar, 2016).

III. Benefits and Deficits of Interventions

On the other hand, dental interventions by professionals requires the use of drills of different kinds, these generate heat which is damaging to the tissue of the teeth, and techniques of sterilization are seldom perfect leaving some microorganisms in situ. The use of a variety of materials to seal the tooth from the older Zinc Phosphate cement to newer self-polymerizing acrylic resins and recent mixtures with UV polymerization, ceramic and composites, seldom produce entirely closed joints with the enamel of the tooth and most amalgam also leaks introducing bacteria (Shafer, et al., 1969). One might say that modern restoration procedures are effective at removing infected tissue and bacteria, but less so at creating barriers to infection, especially given their own degradation times.

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It is generally found that most dental restorations need to be replaced every 5 years (ADACSA, 2003; Kingston, 2013; Araugo, et al., 2019). New methods and practitioner training can increase the life of the filling according to research by Benetti, et al., 2021.

IV. Genetic Variation in Immune Response and Tooth Resistance

Susceptibility to tooth decay depends also on genetics, for example by the spatial arrangement of hydroxyapatite microcrystals in the enamel (Ceve, et al., 1980). Genetic factors are complicated by a number of environmental factors that are difficult to control, yet twin studies have helped elucidate these variations (Wang, et al., 2012). While the ability of teeth to fight off infection and damage by bacteria of different species, there are obvious means of this process that involve the immune system (Athanasiadou, et al, 2018). Deposition of secondary dentin (sometimes called "adventitious" dentin, and dentinal sclerosis are responses of the tooth to irritation and caries (Shafer, et al., 1969). Success of such a response to fight off infection and repair the tooth on a population level is unknown.

One factor here is the lack of comprehensive epidemiological studies of dental pathology and treatment outcomes. Present analysis is often based on National Center for Health Statistics (1978; 1979) from the 1970s (Institute of Medicine, 1980). The 2011 Report of the Institute of Medicine of the National Academies characterized the information available on efficacy and treatment as:

"Concerns have been expressed about the quality of care provided in alternative settings or by new types of professionals, but data on the quality of care and long-term outcomes related to the provision of care by all types of oral health care professionals are almost wholly lacking." (IM, Report, 2011, 9).

V. Conclusion

A study of adults and children today after the end of regular dental regimes in the population at large in a country would provide a substantial advance in our understanding of the process and could also identify genotypes that provide greatest protection. Current conditions of Covid-19 quarantine and distance limits of contact have produced a unique opportunity to study the efficacy of dental procedures, especially regarding restorations. The outcome of such research might effect changes in practice that could be beneficial to dental science and practice and cost to patients.

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Bilateral Internal Carotid Artery Agenesis: Very Rare Cause of Bilateral Pulsatile Tinnitus

By Aynur Aliyeva, Ziya Karimov, Ozlem Yagiz & Fidan Rahimli Alekberli

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Abstract- Bilateral internal carotid artery agenesis is a very rare congenital anomaly. Intracranial blood circulation in the affected internal carotid artery side is provided by collateral vasculature, contralateral internal carotid artery through the anterior communicating artery, and from the vertebrobasilar system through the posterior communicating artery. People with this abnormality may be asymptomatic for many years. However, patients may also be present with ischemic stroke or subarachnoid hemorrhage, headache, and blurred vision. Diagnosis is usually incidental by the performance of carotid artery doppler ultrasonography or cervical/cranial magnetic resonance imaging owing to other symptoms. We report a case of bilateral internal carotid artery agenesis with pulsatile tinnitus lasting five years in the light of clinical presentation and imaging findings.

Keywords: *agenesis, bilateral carotid artery, congenital anomaly, pulsatile tinnitus.*

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Bilateral Internal Carotid Artery Agenesis: Very Rare Cause of Bilateral Pulsatile Tinnitus

Aynur Aliyeva [α], Ziya Karimov [σ], Ozlem Yagiz [ρ] & Fidan Rahimli Alekberli [ω]

Abstract- **Bilateral internal carotid artery agenesis is a very rare congenital anomaly. Intracranial blood circulation in the affected internal carotid artery side is provided by collateral vasculature, contralateral internal carotid artery through the anterior communicating artery, and from the vertebrobasilar system through the posterior communicating artery. People with this abnormality may be asymptomatic for many years. However, patients may also be present with ischemic stroke or subarachnoid hemorrhage, headache, and blurred vision. Diagnosis is usually incidental by the performance of carotid artery doppler ultrasonography or cervical/cranial magnetic resonance imaging owing to other symptoms. We report a case of bilateral internal carotid artery agenesis with pulsatile tinnitus lasting five years in the light of clinical presentation and imaging findings.**

Keywords: agenesis, bilateral carotid artery, congenital anomaly, pulsatile tinnitus.

I. Introduction

Tinnitus is the perception of sound in the absence of a corresponding external acoustic stimulus. This perception of the sound is associated with activity in the peripheral and central nervous systems that does not match the resonant or mechanical activity in the cochlea. The etiology of tinnitus development and maintenance is still unclear. One of the most common causes of tinnitus is pathological changes along the auditory pathway. Many abnormal conditions of the cochlea, such as sudden hearing loss, noise induced hearing loss, presbycusis or the use of ototoxic drugs, accompany this pathology. These lesions causing hearing loss can result in abnormal neuronal activity in the central auditory pathway. Other risk factors for tinnitus development or maintenance are rarely known (1-2). Tinnitus can be sometimes observed in the patients with normal hearing. The patient describes hearing as similar to ringing, roaring, buzzing, or other sounds.10%–15% of the population had tinnitus. It has two types: subjective and objective (3-4). Objective tinnitus is caused by a vascular or muscular origin. The first may be caused by either venous, arterial sources, or arteriovenous shunting. Vascular internal flow reflects rhythmically to the ear in accordance with the heartbeat and blood flow due to the disruption of turbulence. In patients with advanced pulsatile tinnitus, the clinician can sometimes hear these pulsatile sounds during auscultation of the neck and around the ear area. And also as, muscular pulsatile tinnitus results from myoclonus spasm of muscles, most commonly the palatal, tensor tympani, and stapedius. The most common form of tinnitus is non-pulsatile tinnitus, mostly associated with hearing loss and ear diseases (5,6). Pulsatile tinnitus is uncommon, not associated with ear disease but more often in the presence of abnormal extracranial or intracranial blood vessels or intracranial hypertension. Pulsatile tinnitus caused by intracranial hypertension is not synchronized with the heartbeat, and its differential diagnosis is more difficult. Intra-arterial or intravenous angiography, Computer tomography (CT) angiography, and magnetic resonance are used to diagnose classic vascular pulsatile tinnitus.

In this case, we report a patient with an infrequent vascular cause of ipsilateral tinnitus – bilateral internal carotid artery agenesis.

II. Case Report

The patient was a 54-year-old white man who came to the ENT departmentwith a 5-year history of bilateral tinnitus. The tinnitus prevented the patient from sleeping. A physical examination, rutin otorhinolaryngology controls, audiometry, and other tests were normal. Also, tinnitus was not heard during auscultation. We decided to evaluate the patient for another rare cause of tinnitus. A carotid duplex ultrasound study showed no bilaterally internal carotid arteries and blood flow. We performed cranial-cervical Magnetic resonance imaging (MRI) and CT angiography of the patient. CT angiography demonstrated agenesis of the bony carotid canal and smaller cavernous sinus (Figure 1). Blood circulation was supplied via the posterior and anterior communicating arteries. Bilateral ophthalmic arteries were supplied from meningeal arteries.

After consultation with the radiologist, the patient was definitively diagnosed with bilateral carotid agenesis. It was concluded that pulsatile tinnitus occurred in the patient in accordance with the rhythm of the heartbeat due to abnormal blood flow and turbulent

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flow. The patient was informed, all cardiological and cranial scans were performed, and no additional pathology was found. It was reported that there was no clear and definitive treatment for pulsatile tinnitus, and the patient was satisfied with this opinion and continued his routine controls.

III. Discussion

Internal carotid artery (ICA) agenesis is a very rare congenital anomaly with <0.01% incidence (7,8). Tode reported the first absence of ICA in 1787 (9). Though unilateral ICA defect is common, a bilateral variant is also reported[6]. It is usually asymptomatic because of blood supply through anastomosis in the circle of Willis. In addition, blood circulation is possible with continuous embryologic vessels like the trigeminal artery and collaterales that originate extracranially[3,4]. But, it occasionally may be symptomatic and be associated with other congenital anomalies and acquired defects, like partial brain hypoplasia, a functional deficit of cranial nerves, etc.(10-13). Because of decreased blood supply in the affected size, adaptation may be provided unusual vasculature. So, it can cause abnormal vascular conditions like aneurysms and AVMs. Congenital ICA defects were described less in light of clinical neurological conditions. The clinical presentation includes commonly ischemic or hemorrhagic stroke, migraine, subarachnoid hemorrhage, contralateral motor weakness, Horner's syndrome, external ear defect, decreased hearing, and rarely tinnitus (7,8,12,13). Although the affected side is more susceptible to ischemia and can potentially cause clinical symptoms in unilateral cases, the contralateral side is becoming sensitive because of decreased circulation due to the shift of circulation to the affected side.

It should be considered the difference between agenesis, aplasia, and hypoplasia. Agenesis is a completely unsuccessful development with absent primordial tissue by definition. Aplasia is an absent organ in spite of the presence of the main primordial tissue. Hypoplasia is incomplete development, although primordial tissue is presented. Demonstration of the carotid canal is a nuance for differentiation. Even though MRI angiography is performed, CT of the head and neck should be administered to determine the presence/absence of a bony carotid canal(14). In our case, ICA is absent without a carotid canal, so we described it as agenesis. Also, we found a smaller cavernous sinus in the patient that is compatible with other cases in the literature (7).

The most common cause of objective vascular tinnitus is an arteriovenous malformation (AVM) in the posterior fossa (15). ICA agenesis is a very rare cause of tinnitus. Cohen et al. Reported one case of tinnitus caused by unilateral carotid artery agenesis (7). Diagnosis is usually made incidentally with the performance of carotid artery doppler ultrasonography or cervical/cranial MRI and CT due to other symptoms (7). Also, CT or MRI angiogram is required to confirm the diagnosis and assess differential diagnoses (8). Differential diagnoses include congenital or acquired ICA stenosis, common carotid artery hypoplasia, and other aortic arch anomalies (12,16,17).

We report a rare case of bilateral tinnitus caused by bilateral ICA agenesis. There are less than 30 "Bilateral internal carotid artery agenesis" cases in the current literature. According to our knowledge, our report is the first case in which bilateral ICA causes tinnitus.

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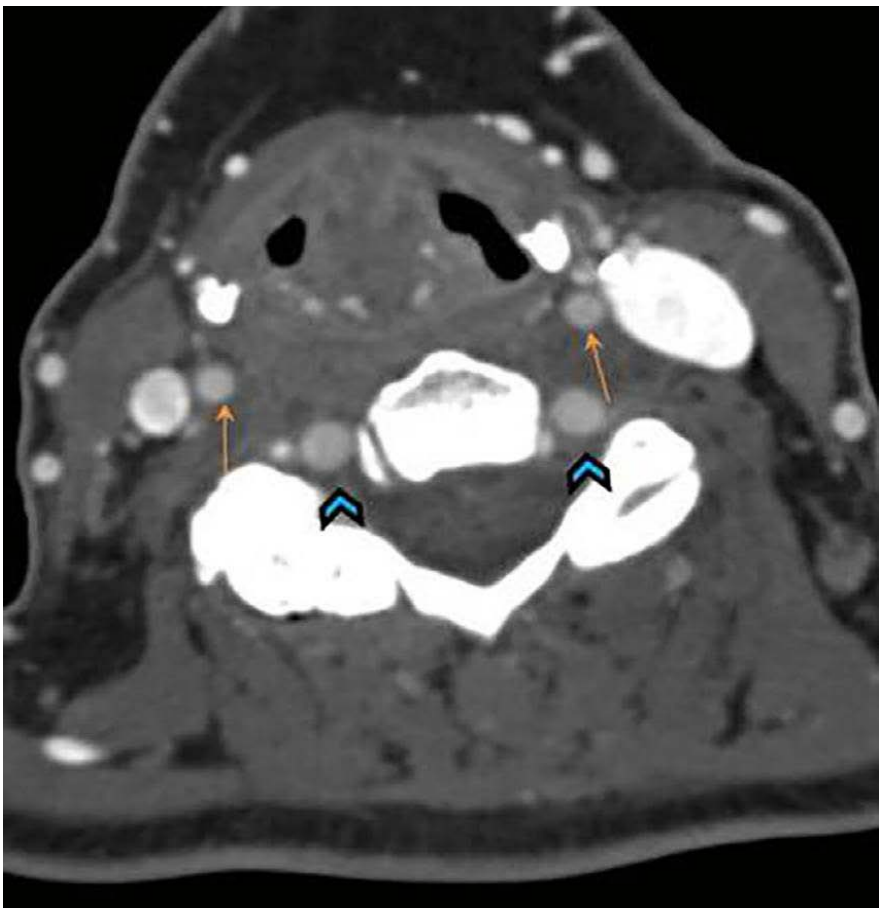

Figure 1: Yellow arrows show common carotid arteries and blue arrows show vertebral arteries.

Author contributions:

AA: Study design, examination of patients, data collection and analysis, manuscript development, and review of the final manuscript.

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Development of Knowledge-Attitude-Practice Questionnaire on Oral Nutrition Supplement among Nurses in Oncology Department and its Reliability and Validity Test

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Methods: Based on literature review and Delphi expert correspondence, the initial questionnaire was constructed on the basis of knowledge-attitude-practice mode. A total of 265 oncology nurses from 5 tertiary care hospitals in Jiangsu Province were selected by convenience sampling method for pre-survey to test the reliability and validity of the questionnaire and form the final version.

Results: The questionnaire included three dimensions: knowledge, attitude and practice, with a total of 43 items; exploratory factor analysis extracted a total of five common factors, with a cumulative variance contribution rate of 81.087%; confirmatory factor analysis results showed that the model fitted well.

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Conclusion: The questionnaire on knowledge-attitude-practice of oral nutrition supplement knowledge among oncology nurses has good reliability and validity. It can be used as an evaluation tool for the level of knowledge-attitude-practice of oral nutrition supplement knowledge of oncology nurses.

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Introduction

Cancer patients often suffer different degrees of malnutrition, which affect the function of body tissues and organs, resulting in a decrease in the patient's tolerance to treatment and the curative effect of tumor treatment, thereby affecting the quality of life and prognosis of patients [1]. Therefore, for cancer patients, nutritional therapy is an essential part of comprehensive cancer therapy. Oral nutritional supplements (ONS) are formulas (foods) for special medical purposes that are ingested orally to supplement insufficient daily diet, and meet the body's nutritional needs by providing nutrients such as carbohydrates, proteins, and fats [2]], is the preferred way of nutritional therapy for patients with normal gastrointestinal function and able to eat orally [3]. ONS can improve the nutritional status of cancer patients, prevent malnutrition and its complications, and enhance anti-tumor efficacy [4]. As the nurses who are most closely contacted during the inpatient treatment of cancer patients, their cognitive and behavioral levels of ONS will affect the patient's compliance with ONS and the effect of nutritional therapy [5]. An evaluation tool for ONS knowledge, belief, and behavior by nurses. Therefore, by compiling a questionnaire on ONS knowledge, belief, and behavior of oncology nurses and testing its reliability and validity, this study provides an evaluation tool for evaluating the status quo of ONS knowledge, belief, and behavior among oncology nurses, and provides targeted training programs and scientific management strategies.

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I. Research Methodology

Compile the ONS Knowledge, Credit and Action Questionnaire

a) Setting up a research group

The research group consisted of 6 members who were familiar with the research contents, including 2 chief physicians of the oncology department, 2 deputy chief nurses and 2 nursing master students. The members of the group are responsible for the formulation of the initial items of the questionnaire, carrying out inquiries from Delphi experts, pre-investigation of the initial questionnaire, and data collection, arrangement and analysis.

b) Compile the initial item pool of the questionnaire

This study is based on the knowledge, belief, and action model [6]. The research team discussed the major and difficult issues related to ONS in cancer patients, followed the best evidence for the implementation and management of ONS in patients with malignant tumors summarized by Zhu Yunxia et al. The initial item pool for the questionnaire. The formed questionnaire item pool includes a total of 51 items, including 12 knowledge dimensions, 16 belief dimensions, and 23 behavior dimensions, mainly

covering ONS pre-use assessment, scope of application, formulation selection, risk assessment, efficacy evaluation, and health education.

c) Delphi expert correspondence

i. *Develop an expert letter questionnaire*

The Expert Letter Questionnaire consists of 4 parts. The first part is the preface, including the background, purpose, significance and filling requirements of the questionnaire; the second part is the basic information of the expert, mainly including the expert's age, education, work field, working years, professional title and position, etc.; the third part For the "Oncology Nurses ONS Knowledge, Attitude and Action Questionnaire Item Evaluation Form", experts are required to use the Likert 5-point scoring method to evaluate the importance of each item, "1-5 points" respectively indicate "not important", "not very important", and "generally important" "More important" and "Very important", and set up "Item Modification Opinion Column" and "Add Item Column" for experts to fill in their opinions and suggestions; the fourth part is the self-assessment form for the degree of authority of experts, including the expert's familiarity with the content and Judgment is based on two aspects.

ii. *Selection of correspondence experts*

Expert selection criteria: high academic level in the field of ONS; engaged in oncology related work for ≥ 10 years; bachelor degree or above; intermediate or above professional title; actively participate in and support this research. A total of 15 experts were invited to participate in the letter inquiries, aged 36-51 (44.07±4.59) years old; education: 9 undergraduates (60%), 6 masters (40%); working years 10-31 (19.93±6.44) Year; Professional Title: 1 Intermediate Professional Title (6.67%), 14 Senior Professional Title (93.33%); Position: 5 Clinical Nursing (33.33%); 9 Nursing Management (60%); 1 Nursing Education (6.67%).

d) Item revisions

Questionnaires are distributed and returned by means of electronic communication. A total of 2 rounds of expert correspondence were conducted in this study, and the effective recovery rates of the questionnaires in both rounds were 100%, indicating that the experts were highly motivated and attached great importance to this research; the authoritative coefficients of the experts in the 2 rounds of correspondence were 0.893 and 0.921, both >0.7 , indicating that the degree of authority of experts is high, and the results of letter inquiry are reliable; the Kendall coordination coefficients of the two rounds of expert letter inquiry are 0.135 and 0.149 respectively (P<0.001). After the two rounds of correspondence, the average value of each item was 4.06 to 5.00, and the coefficient of variation was 0 to 0.18, indicating that the experts had basically reached an agreement and no further correspondence was required.

Taking the item importance evaluation average score < 3.5 and the coefficient of variation > 0.25 as the criteria for item deletion [9], the research team revised the items based on expert opinions. After the first round of inquiries, the research team made the following changes: delete “A4: I think oncology nurses should have the relevant knowledge and skills of ONS”; delete “P12: I will provide patients with different types and flavors of ONS preparations” , to guide patients to choose appropriate ONS preparations”; merge “A6: I think oncology nurses play an important role in improving the efficacy of ONS in patients” and “A7: I think oncology nurses should pay attention to the treatment and care of ONS in cancer patients” as "A17: I think oncology nurses should pay attention to the treatment and care of ONS in cancer patients and play an important role"; will "A11: I think oncology nurses should accurately identify the adverse reactions after ONS, such as gastrointestinal intolerance symptoms, elevated blood sugar, etc.""A12: I think oncology nurses should be proficient in the preventive measures and correct treatment methods for adverse reactions after ONS" merged into "A18: I think oncology nurses should accurately identify adverse reactions after ONS, and take appropriate measures.""K13: When the NRS-2002 score is greater than how many points need to formulate a nutrition plan"; replace "P2: For patients with abnormal screening, I will use appropriate evaluation tools to conduct a comprehensive evaluation of the patients, Objective and quantitative assessment of nutritional intake, nutritional impact symptoms, muscle mass, physical condition, and degree of systemic inflammation" is revised to "For patients with abnormal screening, I will use appropriate assessment tools to conduct a comprehensive nutritional status assessment of the patient Evaluation"; Amend "P13: I will add different kinds of condiments (such as juice, vegetable juice, honey, milk and salt, etc.) to the ONS agent according to the patient's dietary habits and preferences" to "I will Underlying diseases, dietary habits and preferences, adding different kinds of condiments (such as juice, vegetable juice, honey, milk, and salt, etc.) to ONS agents”. "P23: When the patient's dietary intake reaches the recommended daily dietary intake and maintains good nutritional status, I will instruct the patient to discontinue ONS reasonably" to "When the patient's dietary intake reaches the recommended daily dietary intake and maintains good nutritional status" I will instruct patients to gradually stop ONS when their nutritional status is not sufficient, and instruct them to use ONS in a timely manner when dietary intake is insufficient.” After the second round of inquiries, the experts did not put forward new opinions, and the final initial questionnaire included 48 items, including 13

items in the knowledge dimension, 13 items in the belief dimension, and 22 items in the behavior dimension.

e) Reliability and validity test of the questionnaire

i. *Research objects*

Convenience sampling method was used to select nurses in the oncology department of five tertiary hospitals in Jiangsu Province as the research objects from March to April 2022. Inclusion criteria: Qualified as a nurse practitioner and engaged in front-line clinical work; working time in the oncology department ≥ 1 year; voluntary participation in this study. Exclusion criteria: rotation, advanced study, practice nurses; those who are not at work due to illness, affairs, maternity leave, etc. According to the sample size of 5 to 10 times the number of items [9], the minimum sample size is 240 cases, and considering the dropout rate of 10%, this study finally included 270 subjects.

The questionnaires were collected by 2 uniformly trained research team members. The data is collected in the form of questionnaire stars, and the purpose, meaning and precautions of this questionnaire survey are introduced to the research subjects with a unified guide language; in order to avoid omissions, all items are set as mandatory items; in order to avoid invalid questionnaires, the research object with the same user and IP address can only be filled in once. After the questionnaire was collected, it was exported to excel, checked by two people, and the unqualified data were deleted.

ii. *Project Analysis*

a. *Discrimination analysis method*

The critical ratio decision value (CR) was used to test the discriminative degree and discriminating ability of the questionnaire. The questionnaire total scores of the research subjects were sorted from high to low, and the top 27% of the total scores were in the high group, and the last 27% were in the low group. The differences in the scores of each item between the two groups were compared, and the items with CR<3 and no statistically significant difference were deleted [10].

b. *Correlation coefficient analysis method*

By calculating the correlation coefficient of each item with the overall questionnaire and the scores of each dimension, the representativeness of each item is reflected, and the homogeneity of each item with the overall questionnaire and each dimension is judged. Items with a correlation coefficient < 0.40 with the overall questionnaire or the dimension to which it belongs are deleted [11].

c. *Internal consistency reliability analysis method*

Calculate the Cronbach's α coefficient of the overall questionnaire and each dimension, and then calculate the Cronbach's α coefficient of the overall questionnaire and each dimension after deleting each item. If the Cronbach's α coefficient of the questionnaire increases after removing an item, delete the item [9].

iii. *Validity analysis*

a. *Construct validity*

The construct validity of the questionnaire was tested by exploratory factor analysis and confirmatory factor analysis. Exploratory factor analysis: It is suitable for sampling appropriateness value (KMO) > 0.6 and the Bartlett sphericity test has a statistically significant difference (P < 0.05). Contribution rate> 40%; use the orthogonal rotation to maximize the variance to obtain the component matrix, and delete the entries with factor loading values < 0.40 [12]. Confirmatory factor analysis: using the maximum likelihood method for analysis; using the ratio of chi-square degrees of freedom (x2/df), root mean square error of approximation (RMSEA), incremental fit index (IFI), comparative fit index (CFI) , Parsimony Adjustment Fit Index (PCFI), Goodness of Fit Index (GFI), Normative Fit Index (PNFI) and other results to analyze the rationality of the questionnaire structure; the reference standards for each index are x2/df<5.0, RMSEA <0.10, IFI>0.90, CFI>0.90, PCFI>0.50, GFI>0.90, PNFI>0.50 [13].

b. *Content Validity*

The 15 experts who originally participated in the Delphi letter inquiries were invited to evaluate the content validity of the revised questionnaire, using the Likert 4-point scoring method, with "1-4 points" indicating "very irrelevant", "irrelevant", "relevant", "very relevant". ". The content validity of the questionnaire was tested by the item-level content validity index (I-CVI) and the scale-level mean content validity index (S-CVI). It is generally believed that I-CVI>0.78 and S-CVI>0.9 indicate good content validity [14].

iv. *Reliability Analysis*

The Cronbach's α coefficient was used to analyze the internal consistency reliability of the overall questionnaire and each dimension, and the Cronbach's α coefficient was generally required to be >0.80; the questionnaire filling results of 50 oncology nurses were re-collected after 2 weeks, and the correlation between the two questionnaire scores was tested. The test-retest reliability of the questionnaire generally requires a test-retest reliability > 0.70 [11].

f) Statistical methods

Double check and input data, SPSS 23.0 and Amos 23.0 were used for statistical analysis. Use mean and standard deviation, frequency and composition ratio to describe the general data of the research object; use two independent sample t test, Pearson correlation coefficient and Cronbach's alpha coefficient method to analyze items and screen items of the questionnaire; use exploratory factor analysis and confirmatory Factor analysis was used to test the construct validity of the questionnaire; I-CVI and S-CVI were used to test the

content validity of the questionnaire; Cronbach's alpha coefficient and test-retest reliability coefficient were used to test the reliability of the questionnaire. P<0.05 was considered to be statistically significant.

II. Results

a) General information on nurses

A total of 265 valid questionnaires were collected in this study. All of the 265 nurses in the oncology department were female; age ranged from 22 to 49 (33.52±6.80) years; education: 22 (8.30%) junior college, 236 undergraduate (89.06%), and 7 master (2.64%); work in oncology 2-18 (11.31±6.37) years; professional title: 74 (27.92%) with primary professional title, 165 (62.26%) with intermediate professional title, 26 (9.81%) with senior professional title; 32 (12.07%) of specialist oncology nurses; 109 cases (41.13%) had participated in ONS-related knowledge and skills training.

b) Project Analysis Results

i. *Discrimination analysis method*

After the total score of the questionnaire was sorted from low to high, the total score of the 72nd and 193rd subjects was the critical value, and the total score ≤ 134 was divided into the low group, and the total score ≥ 183 was divided into the high group. There was no significant difference in the items K3 (CR=1.025), K4 (CR=2.673), and K11 (CR=1.628) between the two groups (P>0.05). These three items were deleted. The CR values of the remaining items ranged from 4.366 to 12.758 with P<0.05.

ii. *Correlation coefficient analysis method*

The correlation coefficients of items K3, K4, K11 and the overall questionnaire are 0.108, 0.366 and 0.136, respectively, and the correlation coefficients with their knowledge dimensions are 0.215, 0.377 and 0.283, all <0.40, indicating that these three items are homogeneous with the questionnaire. Poor performance, consider deleting it. The correlation coefficients of the remaining items with the overall questionnaire ranged from 0.514 to 0.882, and the correlation coefficients with their knowledge, belief and behavior dimensions were 0.543 to 0.717, 0.577 to 0.748, and 0.754 to 0.893, respectively.

iii. *Internal consistency reliability analysis method*

The Cronbach's alpha coefficients of the questionnaire population, knowledge dimension, belief dimension and behavior dimension were 0.958, 0.862, 0.942 and 0.972, respectively. After removing a certain item, the Cronbach's alpha coefficients of the questionnaire population, knowledge dimension, belief dimension and behavior dimension were 0.765~0.911, 0.711~0.817, 0.793~0.887 and 0.823~0.925, respectively. None of the Cronbach's alpha coefficients increased, indicating that each item made a greater contribution to the internal consistency of the questionnaire, and no item was deleted.

c) Validity analysis results

i. *Construct validity*

a. *Exploratory factor analysis*

In this study, KMO=0.821, and the Bartlett test of sphericity was statistically significant (x2 =9427.980, P<0.001), which was suitable for factor analysis. Factor loadings of 0.337 and 0.289 for entries K2 and K5, respectively, were removed after the variance-maximizing orthogonal rotation. After the entry was deleted, the second exploratory factor analysis was performed, KMO=0.830, and the difference was statistically significant (x2 =4910.303, P<0.001); 5 common factors with eigenvalues>1 were extracted, and the cumulative variance contribution rate Among the five common factors, common factors 1 and 2 are classified as behavior dimensions, common factors 3 and 5 are classified as belief dimensions, and common factor 4 is classified as knowledge dimension, which is basically consistent with knowledge. The theoretical framework of Xinxing. The final questionnaire includes 43 items, including 8 items in the knowledge dimension, 13 items in the belief dimension, and 22 items in the behavior dimension. See *Table 1* for details. The results of the exploratory factor analysis are shown in *Table 2.*

Table 1: Items of ONS Knowledge, Attitude and Action Questionnaire for Oncology Nurses.

Questionnaire Entries for Dimensions
Knowledge
K1: For cancer patients with normal gastrointestinal function, the preferred way to receive enteral nutrition is
K6: When the oral intake of tumor patients during the perioperative period is less than the recommended target calories and protein, ONS should be given before surgery
K7: Symptoms of oral enteral nutrition intolerance mainly include
K8: The highest goal of nutritional support treatment for cancer patients is
The principles of K9: ONS include
K10: Before the implementation of ONS, in addition to fully assessing the nutritional status of the patient, a comprehensive assessment of the patient's general condition should be carried out, including
K12: When taking ONS for patients with oral mucositis, what ways can be used to reduce the pain caused by ONS stimulation of the mucous membrane?

K13: When the NRS2002 score is greater than the number of points, a nutrition plan needs to be developed.
Attitude A1: I am interested in ONS-related knowledge and skills
A2: I wish to receive professional training in ONS-related knowledge and skills
A3: I think oncology nurses should pay attention to patients' nutritional intake, nutritional impact symptoms, physical conditions and laboratory inspection indicators, etc., and use appropriate scales to screen patients for nutritional risk and comprehensively assess nutritional status.
A5: I think ONS can help improve the nutritional status of cancer patients and even play an irreplaceable role in prolonging survival
A8: I think the ONS standardized management process should be developed
A9: I think oncology nurses should be proficient in methods to improve patients' acceptance of ONS preparations
A10: I think oncology nurses should be proficient in the formulation, energy density and preparation method of ONS preparations
A13: I think oncology nurses should strengthen nutrition guidance and education for patients, mainly including the purpose and significance of ONS, preparation and drinking methods, prevention and treatment measures for adverse reactions, etc.
A14: I think nutrition education should run through the whole process, explain the profound things in a simple way, be familiar and understandable, and reinforce it regularly
A15: I think oncology nurses should regularly evaluate the efficacy of ONS. The evaluation indicators mainly include the patient's body weight, BMI, albumin, prealbumin and other laboratory test indicators
A16: I believe that nurses in the oncology department should strengthen the follow-up of patients with ONS, focusing on the implementation of the ONS treatment plan, the compliance of energy intake and the difficulties encountered in the implementation of ONS, and provide guidance during follow-up
A17: I think oncology nurses should pay attention to the treatment and care of ONS in cancer patients and play an important role
A18: I think oncology nurses should accurately identify adverse reactions after ONS and take appropriate preventive and treatment measures.
Action P1: I will learn the knowledge and skills of ONS through various means (such as academic lectures, skills training and literature retrieval, etc.)
P2: I will use an appropriate scale for nutritional risk screening of cancer patients
P3: For patients with abnormal screening, I will use appropriate assessment tools to conduct a comprehensive assessment of the patient's nutritional status
P4: For cancer patients who are malnourished or at risk of nutrition, I will first give them intensive nutrition education
P5: For cancer patients who are malnourished or at nutritional risk, when oral feeding cannot meet their nutritional needs, I will give ONS as soon as possible
P6: ONS is my first choice for enteral nutrition support for cancer patients with normal gastrointestinal tract function
P7: For tumor patients who cannot eat normally for more than 5 days for elective surgery, I will encourage and guide their ONS before surgery
P8: Before implementing ONS, I will inform patients of the nutritional assessment results and educate the purpose and significance of ONS, help them identify existing or potential nutritional problems, and improve patients and their caregivers' awareness and acceptance of the importance of ONS
P9: Before implementing ONS, I will encourage patients to participate in the setting of nutritional treatment goals
P10: I will follow a step-by-step principle to guide cancer patients on ONS
P11: For tumor patients with gastrointestinal symptoms such as loss of appetite, nausea and vomiting, I will first give appropriate symptomatic treatment as prescribed by the doctor
P13: I will add different kinds of condiments (such as juice, vegetable juice, honey, milk and salt, etc.) to the ONS agent according to the patient's underlying disease, eating habits and preferences
P14: During the implementation of ONS, I will give patients and their families adequate nutritional guidance and education, mainly including the concentration, temperature and method of preparation; drinking method of preparation; target dosage of preparation; prevention and treatment of adverse reactions method etc.
P15: I will adopt personalized, easy-to-understand, and easy-to-operate nutrition education methods and approaches according to the patient's age, education level, and psychological status.
P16: When patients encounter difficulties or questions during the ONS process, I will give timely guidance and help
P17: I will deal with the patient's gastrointestinal intolerance, abnormal blood sugar and other adverse reactions by appropriately adjusting the concentration, temperature, dosage and drinking method of ONS, and selecting special preparations.
P18: If the patient's gastrointestinal intolerance symptoms cannot be relieved by properly adjusting the concentration, temperature, dosage and drinking method of ONS, I will suspend ONS first, and the doctor or nutritionist will change the type of ONS preparation
P19: For tumor patients with severe malnutrition, major surgery, and postoperative radiotherapy and chemotherapy, I will guide the patients to continue ONS for 2 weeks to several months after discharge, and continue to pay attention to the nutritional status of the patients
P20: I would encourage ONS users to record their daily ONS usage in a diary or table, including the time and amount of ONS usage, adverse reactions and possible causes, diet, etc.
P21: I will follow up on ONS users regularly, focusing on the implementation of the ONS treatment plan, the energy intake standard and the difficulties encountered in the implementation of ONS, and give guidance during the follow-up

P22: I will regularly evaluate the nutritional status of ONS users, including body weight, BMI, albumin, prealbumin and other laboratory test indicators
P23: When the dietary intake of the patient reaches the recommended amount of the daily diet and maintains a good nutritional status, I will guide the patient to gradually discontinue ONS; when the dietary intake is insufficient, I will guide the patient to use ONS in time.

Table 2: Exploratory factor analysis of ONS Knowledge, Attitude and Action Questionnaire for 265 oncology nurses

Questionnaire items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
P10	0.861	-	-	-	-
P2	0.860	-	-	-	-
P8	0.850	-	-	-	-
P5	0.850	-	-	-	-
P9	0.838	-	-	-	-
P3	0.835	-	-	-	-
P6	0.815	-	-	-	-
P7	0.812	-	-	-	-
P11	0.809	-	-	-	-
P4	0.804	-	-	-	-
P1	0.724	-	-	-	-
P15	0.543	-	-	-	-
P19	-	0.832	-	-	-
P18	-	0.806	-	-	-
P20	-	0.793	-	-	-
P17	-	0.777	-	-	-
P21	-	0.771	-	-	-
P22	-	0.771	-	-	-
P16	-	0.612	-	-	-
P23	-	0.595	-	-	-
P13	-	0.558	-	-	-
P14	-	0.545	-	-	-
A1	-	-	0.935	-	-
A17	-	-	0.926	-	-
A2	-	-	0.921	-	-
A3	-	-	0.913	-	-
A5	-	-	0.909	-	-
A16	-	-	0.854	-	-
A14	-	-	0.801	-	-
A15	-	-	0.611	-	-
K1	-	-	-	0.883	-
K6	-	-	-	0.881	-
K13	-	-	-	0.874	-
K7	-	-	-	0.794	-
K9	-	-	-	0.727	-
K10	-	-	-	0.702	-
K8	-	-	-	0.589	-
K12	-	-	-	0.511	-
A13	-	-	-	-	0.816
A18	-	-	-	-	0.752
A8	-	-	-	-	0.694
A9	-	-	-	-	0.627
A10	-	-	-	-	0.548
Dimension	behavioral dimension	behavioral dimension	belief dimension	knowledge dimension	belief dimension
Cumulative contribution rate (%)	25.127	48.730	64.848	73.856	81.087

Note: Please refer to Table 1 for the explanation of the questionnaire items; K: knowledge dimension item; A: belief dimension item; P: behavior dimension item; common factor 4 is classified as knowledge dimension; common factors 3 and 5 are classified as belief dimension; common factor 1, 2 is classified as behavior dimension; -: blank item

b. *Confirmatory factor analysis*

The fitting results of the questionnaire model are: x2/df=3.494, RMSEA=0.098, IFI=0.914, CFI=0.914, PCFI=0.797, GFI=0.922, PNFI=0.753.

ii. *Content Validity*

The I-CVI of each item of the questionnaire was 0.832-1.000; the overall S-CVI of the questionnaire was 0.914; the S-CVI of the knowledge dimension, belief dimension and behavior dimension of the questionnaire were 0.903, 0.911 and 0.925, respectively.

d) Reliability Analysis Results

The Cronbach's alpha coefficients of the overall questionnaire, knowledge dimension, belief dimension and behavior dimension were 0.958, 0.862, 0.942 and 0.972, respectively; the test-retest reliability of the overall questionnaire, knowledge dimension, belief dimension and behavior dimension were 0.978, 0.761, 0.962, 0.985, respectively.

e) Final Questionnaire of ONS Knowledge, Attitude and Practice of Oncology Nurses

The final questionnaire consists of 43 items, including 8 items in the knowledge dimension, including 3 multiple-choice questions and 5 multiple-choice questions. A correct answer to a multiple-choice question is worth 1 point, a wrong answer is 0 points, and a multiple-choice question is answered correctly. 1 option Score 1 point, wrong answer is 0 point, the scoring range is 0～4 points; there are 13 items in the belief dimension, using Likert 5-point scoring method, "1～5 points" respectively means "strongly disagree" and "disagree" "Not sure", "agree", "strongly agree", the scoring range is 1-5 points; there are 22 items in the behavior dimension, using the Likert 5-point scoring method, "1-5 points" represent "never" and "occasionally" respectively "Sometimes", "Often" and "Always" on a scale of 1 to 5. The overall score of the questionnaire ranged from 35 to 198, with higher scores indicating better knowledge, beliefs and behaviors of ONS nurses.

III. Discussion

a) It is of great significance to compile the ONS Knowledge, Attitude and Action Questionnaire for Oncology Nurses

Rational nutritional support has significant benefits in remission, quality of life and prognosis of cancer patients [15]. ONS is a safe, convenient, cost-effective and effective nutritional treatment measure. The European society for clinical nutrition and metabolism (ESPEN)[16], the Chinese society for parenteral nutrition and enteral nutrition, CSPEN) [17] both recommend ONS as the first choice for nutritional therapy. The intake of ONS requires the active cooperation of patients, and its efficacy depends on the patient's compliance [7]. Nursing staff are the main contacts of patients during hospitalization and play a key role in the implementation and management of ONS. Expert consensus [5] pointed out that insufficient attention and non-standard implementation of ONS by nursing staff will reduce patients' compliance with ONS and affect the treatment effect. Nursing staff should be proficient in the implementation of ONS and translate it into practical actions, which is conducive to improving patients' compliance with ONS and enhancing its efficacy. Good behavior is based on correct knowledge and positive attitudes and beliefs [18]. Understanding the current status of oncology nurses' knowledge, beliefs, and behaviors about ONS can help improve their clinical execution. Therefore, it is very necessary to compile relevant questionnaires to provide a reliable evaluation tool for a comprehensive and objective understanding of oncology nurses' knowledge, belief, and behavior level of ONS, and to provide a basis for targeted training and management decisions.

b) The scientific preparation process of the ONS questionnaire for oncology nurses

Based on the theory of knowledge, belief, and action, this study constructed an initial item pool of the questionnaire according to relevant domestic and foreign literature, covering ONS pre-use assessment, scope of application, formulation selection, use risk assessment, efficacy evaluation, and health education. The relevant content of ONS is comprehensively included to ensure the standardization of the questionnaire items. This study adopts the Delphi method to invite clinical nursing, nursing management and nursing education experts with high academic level, solid theoretical foundation and rich clinical experience in the field of ONS to revise the initial item pool of the questionnaire; The recovery rate is 100%, and the authoritative coefficients of the experts in the two rounds of correspondence are 0.893 and 0.921 respectively, indicating that the experts have high enthusiasm and authority, and can make professional judgments and make valuable suggestions for each item, which ensures that the experts are highly motivated and authoritative. The rigor of the letter inquiry process and the reliability of the letter inquiry results; the research team revised and improved the questionnaire according to expert opinions, which ensured the rationality of the questionnaire items. In this study, statistical methods such as discrimination analysis method, correlation coefficient analysis method and internal consistency reliability analysis method were used to screen the questionnaire items, try to avoid the deviation caused by the selection of items by a single method, and ensure the representativeness and reliability of the questionnaire items. Sensitivity. In this study, the questionnaire was pre-investigated to test its reliability and validity, which ensured the stability and validity of the structure and content of the questionnaire.

c) *The ONS Knowledge, Attitude and Action Questionnaire for Oncology Nurses has good reliability and validity*

Reliability reflects the consistency of evaluation tools, that is, whether the evaluation tools can stably evaluate the measured variables. The overall Cronbach's α coefficient of the questionnaire prepared in this study was 0.958, and the Cronbach's α coefficient of each dimension was 0.862-0.972, all >0.80, indicating that the questionnaire had good internal consistency. The test-retest reliability of this study was 0.978, and the test-retest reliability of each dimension was 0.761-0.985, all >0.70, indicating that the questionnaire has good stability and consistency across time. Validity refers to the degree to which the assessment tool reflects the expected research concept, that is, the correctness and validity of the questionnaire [12]. After 2 rounds of exploratory factor analysis, this study extracted 5 common factors, the cumulative variance contribution rate was greater than 40%, and the factor loading of each item was greater than 0.4, indicating that the questionnaire was basically consistent with the theoretical structure of the questionnaire; the confirmatory factor analysis results showed that , x2/df < 5.00, RMSEA < 0.10, IFI, CFI, GFI are > 0.90, PCFI, PNFI are > 0.50, all fitting indicators are in the acceptable range, indicating that the model fits well. The above results show that the questionnaire has good construct validity. The overall S-CVI of the questionnaire in this study is 0.914, the S-CVI of each dimension is 0.903-0.925, all > 0.90; the I-CVI of each item is 0.832-1.000, all > 0.78, indicating that the content of this questionnaire can reflect the The current status of ONS knowledge, belief, and behavior among nurses in the oncology department has good content validity.

IV. Conclusion

The ONS knowledge, belief, and behavior questionnaire for oncology nurses prepared in this study has good reliability and validity. It can be used as a scientific tool to assess the current status of ONS knowledge, belief, and behavior of oncology nurses, and provides a theoretical basis for carrying out targeted training programs and formulating scientific management strategies. Due to limited conditions, this study only investigated five tertiary first-class hospitals in Jiangsu Province, and the generalizability of the questionnaire was limited. In the future, the sample size will be increased and expanded to hospitals in multiple regions and levels to further verify and improve the questionnaire.

Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declared that they have no conflicts of interest regarding this work.

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Impact of ICON on the Adhesive Microleakage Underneath Orthodontic Bracket

By A. Soares e Lucas

Abstract- *Objectives:* The aims was to assess the changes in tooth orthodontic bracket interface micro-leakage after applying a caries resin penetrated to the sound enamel tooth surface.

Materials and Methods: Sixty human maxillary first premolars were collected, randomly separation of the teeth into two groups. The experimental one (treated with ICON) was categorized in to three subgroups (n= 10 each) (ICON in distal water, ICON in cow milk, ICON in Coca cola) while control group was classified three subgroups (n=10) (control in distal water, control in cow milk, control in Coca Cola) incubation time persisted three weeks in total.

Results: A one-way analysis of variance (ANOVA) produced a significant difference between all experimental groups (ICON in distal water, ICON in milk, ICON in Coca Cola drink) and control subgroups (control in distal water, control in Cow milk, Control in Coca Cola).

Keywords: *caries infiltration; enamel; ICON; microleakage, white spot lesion.*

GJMR-J Classification: *NLMC Code: WU 400*

Strictly as per the compliance and regulations of:

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Results: A one-way analysis of variance (ANOVA) produced a significant difference between all experimental groups (ICON in distal water, ICON in milk, ICON in Coca Cola drink) and control subgroups (control in distal water, control in Cow milk, Control in Coca Cola). According to the results of the Mann-Whitney U test, ICON pretreatment tooth samples had significantly lower mean values of microleakage than non-ICON tooth samples. The control group in the energy drink subgroup had the highest mean microleakage value when compared to the other subgroups, whereas the resin infiltrated group in distal water had the lowest mean value.

Conclusions: Orthodontic adhesive (control group) revealed that a resin penetrate on a sound enamel surface prior to orthodontic bracket bonding reduced bracket tooth interface microleakage in all examined groups. The ICON-infiltrated surface was discovered to provide a secondary preventive strategy against white spot lesion development and reducing micro-leakage under orthodontic brackets.

Keywords: caries infiltration; enamel; ICON; microleakage, white spot lesion.

I. Introduction

Microleakage is a complicated situation with such a fixed orthodontic appliance therapy. It is a loss of marginal integrity that permits white lesions to grow around and under the bracket, potentially resulting in reduction the bracket bonding strengths. (1) White spot lesions are clinical and cosmetic issues characterized by enamel demineralization, tooth discoloration, corrosion, and bond strength deterioration. (2)

Since orthodontic braces, bands, ligatures, and other orthodontic accessories are difficult to clean and increase bacterial biofilm accumulation on tooth surfaces, white spots develop around them.(3, 4) White spot lesions have become more predominant with fixed orthodontic appliances.(5, 6) Oral hygiene, sex, orthodontic treatment time, wheat consumption, and diet all have an influence on the appearance of white spots lesions.(7,8) To avoid additional demineralization and cavitation, these lesions should be recognized early.(9) restorations, crowns, and veneers, which necessitate enamel reduction beyond the demineralized area, possibly even to the dentin (10), are among the options for treating white spot lesions. To remineralize these lesions on the surface, casein phosphopeptide amorphous calcium phosphate (CPP-ACP) products as MI Paste and MI Paste plus, as well as fluoride dentifrice, mouthwash, gels, varnish, and gels, can be utilized.

A resin infiltration material (ICON), have recently been encouraged. (11,12) which is a substance with a low viscosity (13). The primary knowledge of resin infiltration is to use capillary forces to enter and encloses the porosity volume of underlying imperfections, replenishing missing minerals, enclosing hydroxyapatite crystals, and micromechanically linking the residual enamel prisms. (14,15) The current research was deliberate in order to evaluate the variations in tooth orthodontic bracket interface microleakage after smearing a caries resin penetrated to the sound enamel tooth surface.

II. Materials and Methods

Ethical approval

The ethical approval was attained by the REC of the University of XXX.

a) Study sample design

Sixty human maxillary first premolars extracted for orthodontic purposes were used in the study. In order to avoid microbial growth, teeth were maintained at room temperature in a glass container in a solution of normal saline (Panther, USA) containing 0.1 percent thymol (Sigma, USA) that was altered daily.[16,17] The study excluded teeth having caries, enamel abnormalities, abrasions, attrition, fractures, or any other developmental problems. [18] Buccal surfaces were scrubbed and polished for 15 seconds with a slow speed handpiece and non-fluoridated pumice and a rubber polishing cup, then rinsed and dried with oil-free air steam for another 15 sec. [19,20]

Group A: control group samples of teeth not treated with ICON material.

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Group B: experimental group samples of teeth treated with ICON material.

b) Bracket bonding

In the control group, (37%) phosphoric acid etching gel (Ivoclar, Vivadent, Liechtenstein) was placed to the buccal enamel surface for 30 sec, then its washed with plenty of water for 15 sec. and dried until the etched surface looked chalky [21].60 new Stainless-steel maxillary first premolar 0.022 slot Roth brackets (Dentarum Germany) was used. The bracket's base surface area was measured to be 9.786 mm^2[22]. Brackets were attached to the teeth by application of a thin layer of 3M adhesive (USA) applied to the buccal surface of the enamel in the middlemiddle third [21]. A weight of 200 grams was overloaded to the bracket for [23]. All unnecessary bonding excess around the bracket was cleaned by sharp probe. The adhesive was cured with a light cure unit (IOS) with a light intensity greater than 1200mW/cm^2 and a wave length600 nm [24]. The light curing device was fitted on a shaft to standardize the distance between the light device and the braces base to 2mm[25]. The whole curing time is20s,10sfor each mesial and distal sides [26]. Concerning the ICON group, ICON was smeared according to the production as the following:

1. Apply ICONEtch. Let sit for 120 sec.
2. Water rinsing for 30s, then dry in a wateroil free air.
3. ICON Dry is used. Lie on the site for 30s to conduct a visual assessment. The whitish opaque lesion discoloration must diminish significantly; otherwise repeat steps 1-3. Dry with wateroil free air.
4. Switch off the operatory light. Apply IconInfiltrate. Let it sit for at least for three minutes. Maintain the wet lesion surface with an occasional twist of the syringe.
5. Disperse with air, and floss. Lightcure for 40s.
6. Substitute applicator tip. Smear ICONInfiltrate. Let sit for one minute and eradicate excess and floss. Lightcure for 20 seconds, Polish.

3M adhesive and brackets were applied likewise to the group A. in order to prevent microleakage from the pulp chamber, tooth apices were covered with sticky wax to seal the root apices. To prevent microleakage from other places of the tooth, clear nail varnish was applied in two layers on buccal tooth surfaces, except for 1 mm around the orthodontic bracket base [16, 27].

c) Packing of groups

Each group (control, experimental) was subdivided into three equal subgroups (n=10) based on storage media:

Subgroup A: Distal water was used to retain tooth samples immersed.

Subgroup B: Tooth samples were saturated in an energy drink for fifteen minutes three times\ day at 1 hour intervals. [28] They were previously stored in distal water.

Subgroup C: Tooth samples were immersed in fresh cow milk drink for 10 minutes three times daily at 1 hour intervals. They were previously stored in distal water. The incubation phase lasted 2 weeks in entire [28].

d) Microleakage Evaluation

Teeth were then submerged for 24 hours at room temperature in a 0.5% solution of basic fuchsine (0.5 gm powder dissolved in 100 ml distilled water).The samples were rinsed with running water; A nail varnish and the superficial pigment were dressed with a brush.[27] At about the center of the bracket a slow speed disk was used to part each tooth in a buccolingual direction [16].

A light microscope was used to evaluate microleakage in millimeters at enameladhesive contacts on the occlusal and gingival sides for all pieces. The same and other investigator randomly checked half of the samples for a second time to calculate the microleakage. We get no significant variations in microleakage ratings between the first and second measurments.

The following principles were used to score the work: [22]:

Score 0: There is no dye penetration thru the adhesive-enamel contact.

Score 1: At the adhesive enamel contact, dye penetration is limited to 1 mm.

Score 2: At the adhesive enamel contact, dye infiltrates into the inner half (2 mm).

Score 3: At a depth of 3 mm, the dye penetrates the adhesive enamel contact.

e) Statistical Analyses

One-way ANOVA was used to evaluate the results, followed by Mann-Whitney U tests to compare group's means. Statistical significance was settled to be $P \leq 0.05$.

III. Results

A significant difference was discovered using (ANOVA) between all ICON treated teeth subgroups, although the comparisons in control subgroups (without ICON treatment), were revealed a significant difference. The Mann-Whitney U tests findings showed that the mean value differed significantly for ICON groups. The resin infiltrated group in deionized water had the lowest mean value of microleakage. There was the highest microleakage value in Coca Cola subgroup's than in control one when compared to the other subgroups, and there was a significant difference between all subgroups at $P \leq 0.05$.

IV. Discussion

There was a significant difference between all subgroups (distal water, cocacola drink, cow milk) in both control and experimental groups.

The effect difference of the microleakage test between control and experimental groups was shown in tables (2 and 3), where showed a highly significant difference at $P \leq 0.05$ between groups, and evaluating the microleakage test with and without using ICON, which was used as a preventative mean on the induced white spot lesions at the enamel surface [29, 30], table (4) shows a obvious difference in microleakage between groups.

As the coca cola drinks include acids, they discovered the highest microleakage value at adhesive enamel interface, which was reliable Pulgaonkar and Chitra findings of (2021) [31, 32] studying in explaining a detrimental influence on the brackets. Enamel demineralization carry about enamel erosion and adhesive material loss, as well as an increase in the microleakage after the brackets, this might also be linked to the existence of great doses of refined carbs, which encourage greater levels of acid. Also, Citric acid and citrate are adept of binding to calcium in the teeth enamel, possession the pH low for extended periods of time and promoting microleakage, as pronounce by Oncag et al., 2005 [33].

For the all tested subgroups, gingival sides showed significantly greater microleakage than occlusal sides. This is consistent with the results of Arhun et al., 2006[34] who related difference to relative surface curvature, which might lead to higher adhesive on the gingival side. Microleakage can occur as a result of infusion, which is produced by a difference in the thermal expansion coefficients of brackets, enamel, and adhesive. This is approximately that both Salman and Al-Ani, (2021) approve with. [35]

After the control in Coca cola drink, the control in cow milk group had a significant high microleakage. As milk lipids are insoluble in water, they would assign to the surface of the bonded teeth. Fat gathering weakens the resin and increased the microleakage. This is reinforced by Anicic *et al*. (2020). [36]

ICON's low viscosity permits it to competently penetrate the teeth enamel. Microleakage in the ICON groups (ICON, ICON in cow milk, and ICON in Cocacola drink) was lesser than in the other control subgroups, which approves with Li *et al*. (2021). [37] Their findings are linked to the capacity of resin infiltration to effectively seal porous structures in the enamel and improvement the ability of sound enamel surfaces to endure acid erosion and demineralization, produce it harder for external acids to admittance the holes in the enamel. As a result, resin penetration may assistance in preventing acid erosion and demineralization of dental enamel. Arnoldand Naumova (2016)[38] also established that addition resin infiltrate to enamel caries can quantity and reservation effects on the enamel.

V. Conclusion

Icon infiltrated surface could be used as a secondary preventative approach beside white spot lesion development in orthodontic patients by inhibiting microleakage under the brackets. Also the consumption of the acidic solution and fatty beverages increased the microleakage under the orthodontic braces.

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Table (1): Storage media, PH, Ingredients

Storage media	pH	Ingredients
Distal water	7.1	
Coca Cola	3.2	Carbonated water, sugar, citric acid, sodium citrate, benzoic Acid, taurine, glucuronolactone, caffeine, inositol, caramel, acidity regulators, stabilizer, natural fruit flavors, vitamins like B2, B5, B6 and B12.
Milk	6.2	8.5% non-fat milk solids, 3% butterfat (full cream milk), Vitamins D and A, butterfat, purified water, stabilizer and Emulsifier.

Table (2): Statistical analysis of microleakage for standard groups

Groups	Occlusal Mean ± SD	Gingival Mean ± SD
Control	0.8130 ± .02358 A	.9951 ± .05912 A
Control in cow milk	2.0221 ± .12454 B	2.6351 ± .12031 B
Control in coca cola drink	3.4921 ± .06051 C	3.8971 ± .07817 C
*P*value	0.000	0.000

Table (3): Statistical Analysis of Microleakage for Experimental subgroups

Groups	Occlusal Mean ± SD	Gingival Mean ± SD
ICON	0.3251 ± 0.01081 A	0.4411 ± 0.01196 A
ICON in cow Milk	0.6121 ± 0.01750 B	0.9460 ± 0.04743 B
ICON in cocacola Drink	1.6171 ± 0.07904 C	1.9631 ± 0.09614 C
F value	2070.553	1549.178
*P*value	0.000	0.000

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Une Nouvelle Technique D'ancrage Mandibulaire

By Paul Cresseaux & Raphaël Filippi

Introduction- Lancrage postérieur au niveau de la mandibule a toujours été compliqué à obtenir lors de nos traitements orthodontiques.

Nous avons essayé un grand nombre de vis d'ancrage et de systèmes de plaques qui nous ont donné des résultats cliniques tout à fait acceptables mais qui avaient beaucoup d'inconvénients.

La zone de trigone rétro-molaire présente une muqueuse épaisse et un accès compliqué.

Les systèmes sont souvent difficiles à utiliser et à réactiver pour les orthodontistes. Ils sontgênants pour les patients qui sont fréquemment blessés, ce qui augmente significativement les rendez-vous d'urgence dans nos cabinets. Pour finir, ils nécessitent tous une réintervention chirurgicale au moment de leur dépose car ils sont enfouis pour être solidement ancrés en distal des dents mandibulaires.

GJMR-J Classification: *DDC Code: 617 LCC Code: RK1*

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Une Nouvelle Technique D'ancrage Mandibulaire

Paul Cresseaux [α] & Raphaël Filippi [σ]

I. Introduction

L'ancrage postérieur au niveau de la mandibule a toujours été compliqué à obtenir lors de nos traitements orthodontiques.

Nous avons essayé un grand nombre de vis d'ancrage et de systèmes de plaques qui nous ont donné des résultats cliniques tout à fait acceptables mais qui avaient beaucoup d'inconvénients.

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Les systèmes sont souvent difficiles à utiliser et à réactiver pour les orthodontistes. Ils sontgênants pour les patients qui sont fréquemment blessés, ce qui augmente significativement les rendez-vous d'urgence dans nos cabinets. Pour finir, ils nécessitent tous une réintervention chirurgicale au moment de leur dépose car ils sont enfouis pour être solidement ancrés en distal des dents mandibulaires.

Toutefois, cette zone est très intéressante pour un ancrage orthodontique car distaler des molaires mandibulaires ouvre de nouvelles voies dans de nombreux plans de traitement.

Nous nous sommes inspirés d'une technique développée dans les années 1930, par Vitali Abalakov, un alpinisme soviétique. Il révolutionna l'alpinisme en développant un ancrage infaillible dans la glace, qui lui a permis de réaliser de nombreuses ascensions dans le Caucase.

Cette technique, qui porte son nom, fut une véritable révolution en alpinisme glacière et est encore utilisée de nos jours. Ce système est rapide à mettre en place, peu coûteux (ne nécessite qu'un simple morceau de cordelette), très facile à déposer et ne laisse, au final, aucune trace dans la glace.

Il s'agit d'un ancrage d'une grande simplicité puisque ce n'est que la connexion, par une cordelette, de 2 trous dans la glace qui se rejoignent. Il est extrêmement fiable grâce au pont de glace qui emprisonne la corde.

Situation finale de l'ancrage, vue de face. La cordelette est emprisonnée par un pont de glace.

Nous avons donc logiquement essayé d'utiliser l'idée géniale de cet alpiniste pour répondre à nos problématiques d'ancrage postérieur à la mandibule.

Nous proposons dans cet article un nouvel ancrage orthodontique, qui comme l'Abalakov dans les années 30, révolutionnera certainement l'ancrage dentaire. Avec cette technique, l'ancrage postérieur mandibulaire est désormais simple, fiable, peu coûteux, ne nécessite pas de réintervention chirurgicale, est facilement ré-activable et surtout, est très confortable.

Nous vous présentons dans cet article un cas clinique où une distalisation molaire et un redressement des incisives mandibulaires étaient indispensables afin d'obtenir un résultat de qualité:

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Examen exobuccal

Cette patiente a déjà été traitée lorsqu'elle était adolescente. Elle présentait une classe 2 dentaire et squelettique et son orthodontiste lui avait alors extrait quatre prémolaires définitives.

Elle présente aujourd'hui des troubles articulaires avec une limitation d'ouverture buccale, un sourire gingival et une rétrogénie.

Examen endobuccal

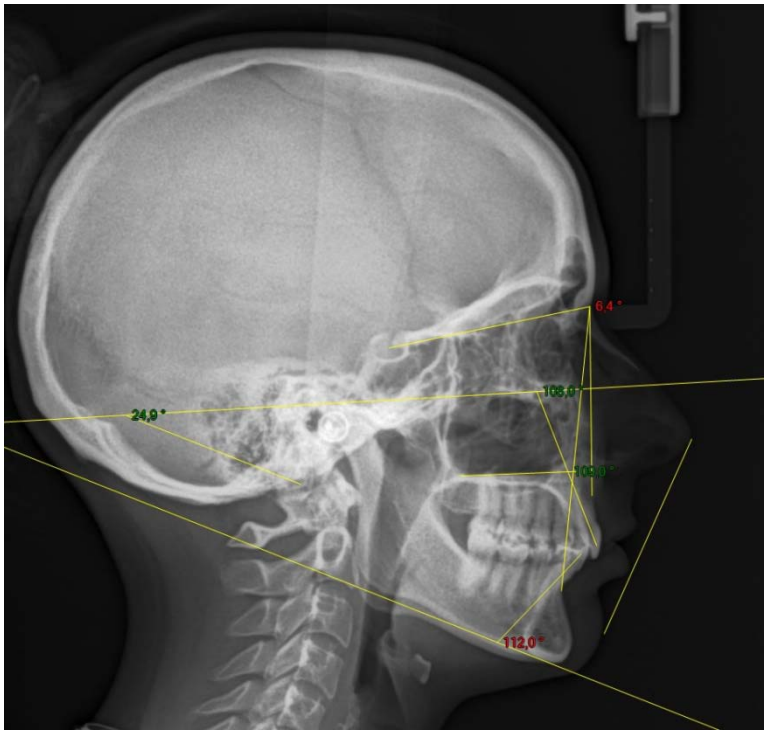
L'examen endobuccal montre une supraclusion incisive, une DDM et un sens transversal correct. Dans le sens sagittal, on note une classe II dentaire.

Examen endobuccal

A l'examen radiographique, on observe que les dents de sagesse ont été enlevées.

Orthopantomographie de début de traitement.

L'examen céphalométrique confirme le diagnostic de classe II squelettique par rétromandibulie et la forte vestibulo-version des incisives mandibulaires (112°).



Examen céphalométrique de début de traitement.

a) Le traitement choisi est le suivant

Un protocole orthodontico-chirurgical d'une durée de 18 mois.

Nous proposons des ancrages mandibulaires de type Abalakov afin de préparer efficacement le geste d'avancée mandibulaire en redressant l'incisive inférieure.

Notre objectif est de distaler les molaires et de retrouver un axe mandibulaire correct de 90°. Cela permettra une propulsion mandibulaire efficace pour corriger la rétrogénie et obtenir une occlusion correcte en classe I avec des axes dentaires normalisés.

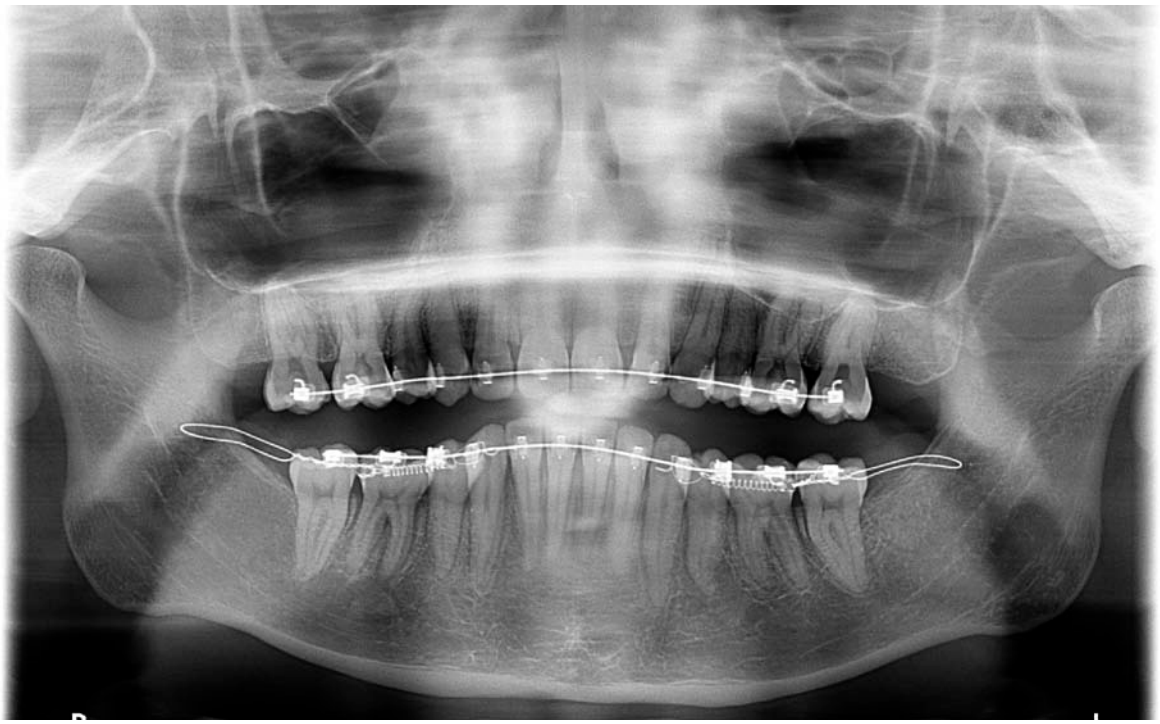
La patiente est appareillée par le Docteur Raphaël FILIPPI avec système multi-attache vestibulaire GC Orthodontics auotoligaturant en Roth .022x .028.

Les premiers fils mis en place sont des arcs Bio Edge .020x.020 / F200 de chez GC (arcs à mémoire de forme).

Les ancrages postérieurs mandibulaires par fil d'ostéosynthèse sont positionnés par le Dr Paul CRESSEAUX.

Les ancrages seront mis en place le jour de la pose des attaches et connectés immédiatement aux canines mandibulaires avec des ressorts NiTi de 300g des deux côtés.

Une chainette élastique est mise en place de 33 à 43 afin d'éviter de voir apparaitre des diastèmes entre les dents antérieures lors du recul. Le recul se fait en masse sans aucun effet parasite car la direction de traction est dans l'axe du fil inférieur. La chainette sera changée tous les mois lors des RDV de la patiente.



Orthopantomographie prise lors de la mise en traction du système. Les ressorts sont connectés entre les Abalakov et les canines mandibulaires en traction directe.

b) La procédure chirurgicale

Nous utilisons de simples fils d'ostéosynthèse qui étaient utilisés il y a 20 ans, avant l'avènement de l'ostéosynthèse par plaque.

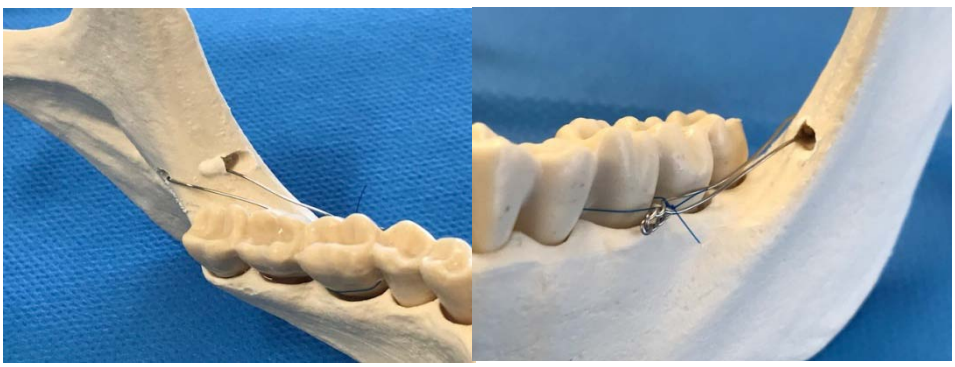
Ils sont placés en regard de la moitié de la hauteur coronaire molaire, ce qui correspond à la hauteur de collage de l'appareil multi-attache.

Ces fils peuvent être insérés sous anesthésie locale (une sédation intraveineuse peut la compléter). L'accès à la branche montante de la mandibule est équivalent à l'accès réalisé pourles extractions des dents de sagesse. Celles-ci sont d'ailleurs souvent extraites lors de l'opération, ce qui permet d'améliorer le recul de l'arcade inférieure donc le redressement incisif.

Une perforation de la branche montante est réalisée, sous irrigation, grâce à une fraise boule montée sur pièce à main chirurgicale, afin de faire passer le fil d'ostéosynthèse de part et d'autre, en protégeant le nerf lingual.

Un fil d'ostéosynthèse (de 4/10ème de mm de diamètre) est ensuite inséré dans la perforation. Les deux brins seront toronnés et repliés au niveau de l'appareil d'orthodontie pendant le geste chirurgical afin de ne pas gêner le patient. La mise en traction par l'orthodontiste peut avoir lieu rapidement après la mise en place du système.

Les suites opératoires sont simples et le plus souvent résumées à celles de l'extraction des dents de sagesse quand elles ont lieu dans le même temps.



L'ancrage est mis en traction par un ressort NiTi de 300 grammes mis en place de façon simple après l'intervention. L'extrémité postérieure du ressort NiTi est fixée sur la partie toronnée du fil d'ostéosynthèse. L'extrémité antérieure du ressort est connectée à l'appareil multi bagues inférieur par une ligature métallique. Il s'agit dans ce cas d'une traction directe.

Dans le cas de notre patiente, la distalisation débute sur un arc à mémoire de forme de section .020 x .020.

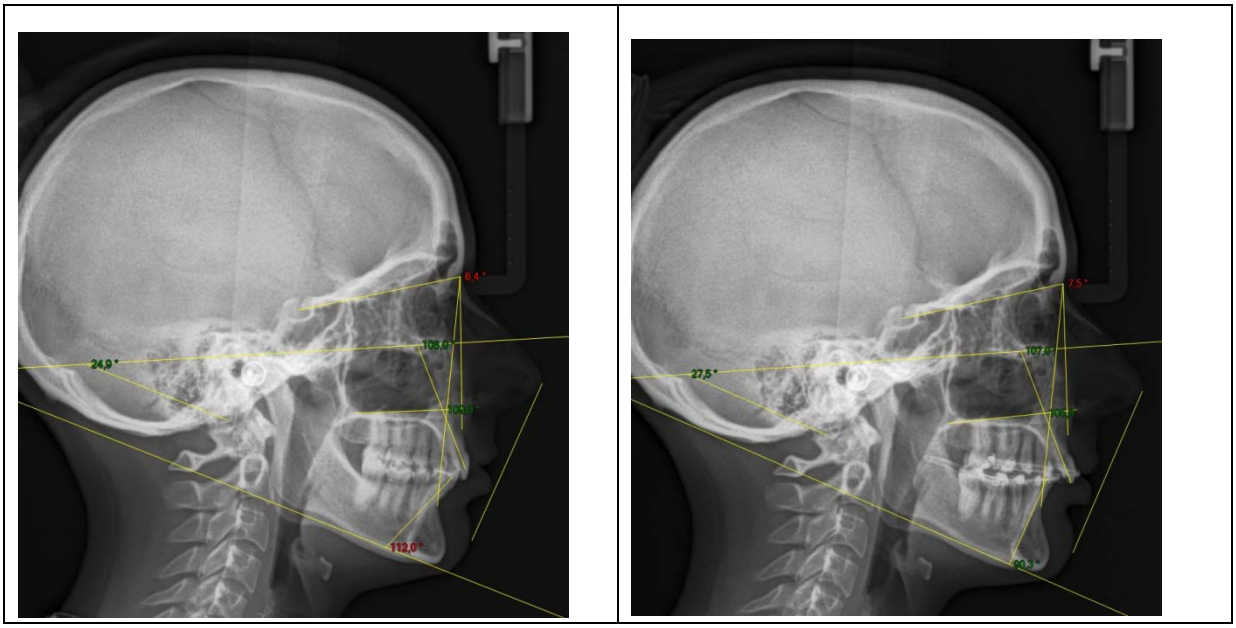
Vue du système de traction du côté droit, gauche, puis en vue occlusale.

Les premiers résultats sont obtenus rapidement. La traction n'a pas besoin d'être réactivée à chaque rendez-vous.

Au bout de 6 mois de traction, le redressement incisif souhaité est obtenu et nous programmons l'intervention d'avancée mandibulaire.

La comparaison des téléradiographies permet d'objectiver le redressement incisif mandibulaire et la distalisation molaire mandibulaire obtenue. Nous observons également le maintien des axes incisifs au niveau de l'arcade maxillaire.

On note un redressement incisif très important. En effet, l'axe incisif mandibulaire est passé de 112° à 90.3° en 6 mois. Une distalisation molaire de3 mma également été obtenue. Les axes incisifs maxillaires ont été maintenus, ce qui correspond parfaitement à notre objectif de départ.



Téléradiographies de profil: comparaison entre l'image de début de traitement et l'image de contrôle après 6 moisde traction sur l'ancrage par fil dans la branche montante mandibulaire. L'angle incisif est passé de 112 à 90,3°.

Tout au long du traitement, le patient ne s'est plaint d'aucune gêne due à ce système de traction et elle l'a même décrit comme « confortable ». Le système a été déposé au cours de la chirurgie orthognathique. L'opération a été réalisée par le Dr Paul CRESSEAUX, au cours du 7ème mois de traitement.

Grâce au bon redressement des axes incisifs et donc à une phase de décompensation pré-chirurgicale efficace, l'avancée mandibulaire a pu être suffisante et a permis de complètement corriger la classe II squelettique et dentaire.

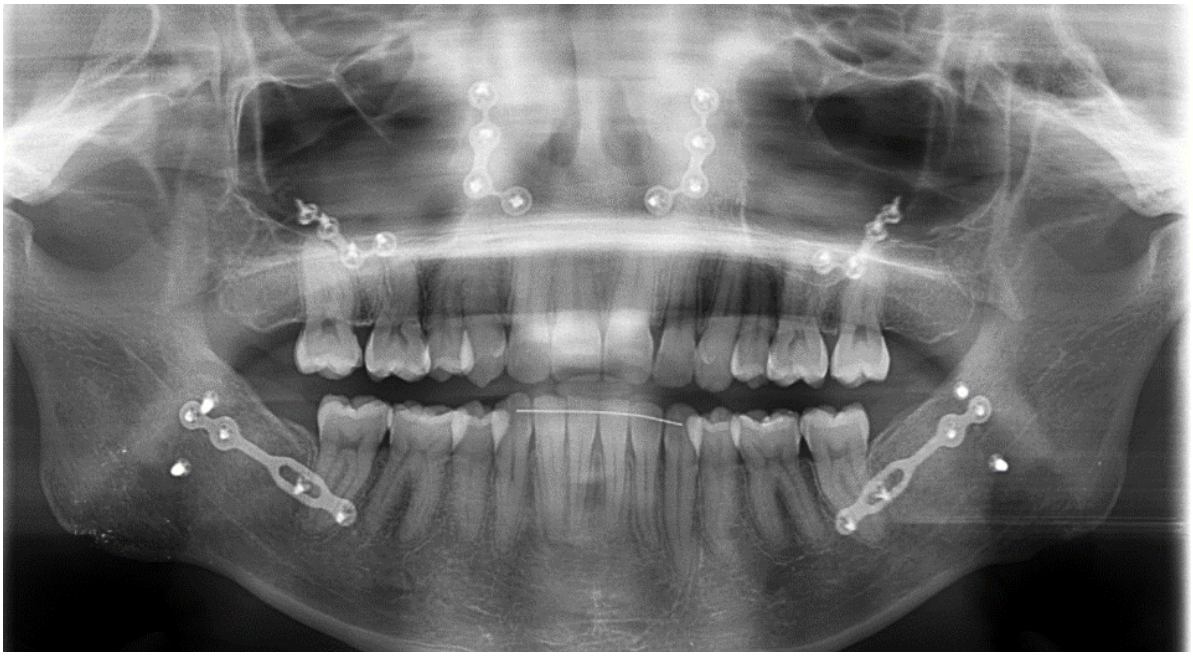
La phase de décompensation pré-chirurgicale a été obtenue très rapidement grâce à notre ancrage.

La durée totale de ce traitement orthodontico-chirurgical a donc finalement été de 15 mois.

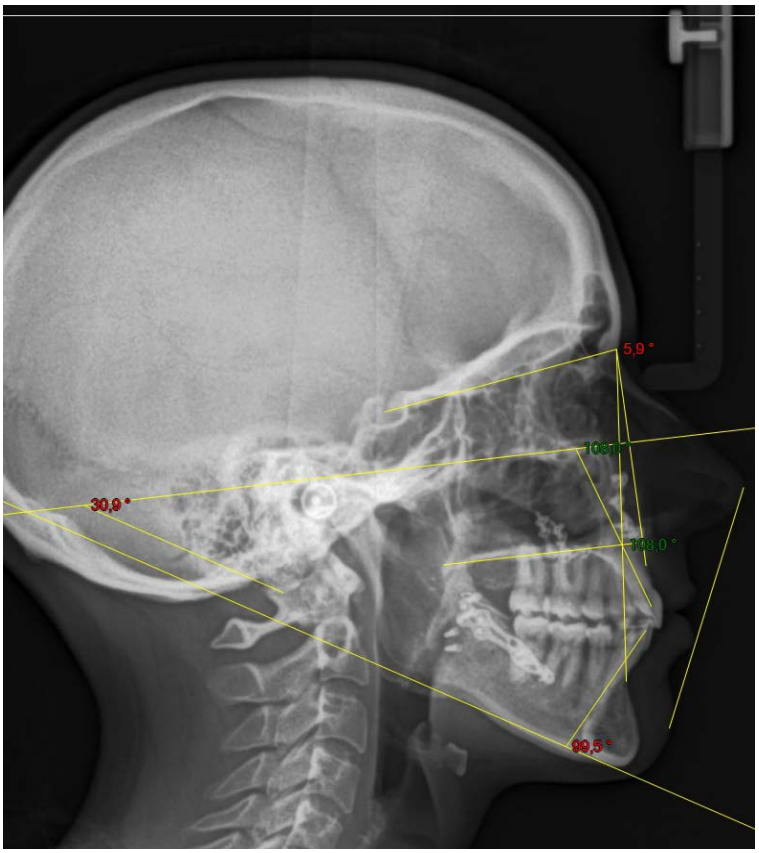
Les objectifs squelettiques, dentaires et fonctionnels ont été atteints.

Photos exobuccales de fin de traitement.

Photos endobuccales de fin de traitement.



Examen orthopantomographique de fin de traitement



Examen céphalométrique de fin de traitement.

II. Conclusion

L'ancrage par fil mandibulaire nous a fait entrer dans une nouvelle dimension de l'ancrage orthodontique. Comme souvent, les bonnes idées se déclinent dans différents domaines et l'ingéniosité de Vitali ABALAKOV a révolutionné notre pratique orthodontique au quotidien.

La distalisation de dents mandibulaires est devenue une option orthodontique simple, confortable pour les patients et aussi pour l'orthodontiste. Les

résultats sont prédictibles et le système ne constitue pas un surcoût pour le patient.

Les préparations orthodontiques des chirurgies d'avancée mandibulaire où un redressement incisif important est nécessaire peuvent s'envisager sereinement et les indications d'extractions de prémolaires deviennent plus rares. Les corrections purement orthodontiques des classes III dentaires avec un recul des dents mandibulaires seront désormais abordées plus simplement.

Nous avons décidé d'un commun accord entre les Docteurs Paul Cresseaux et Raphaël Filippi d'appeler cet ancrage osseux « un ABALAKOV ».

Conflits d'intérêt: les auteurs déclarent n'avoir aucun conflit d'intérêts

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Lateral Approach Sinus (LAS) and Crestal Approach Sinus (CAS): The Unravelled Paraphernalia for Maxillary Sinus Membrane Advancement

By Dr. Rinisha Sinha, Dr. Pranave P, Dr. Aishwarya Sabharwal, Dr. Nidhi Saripalli, Dr. Shiksha Dhawan & Dr. Nishita Bhosale

Bharati Vidyapeeth (Deemed to be University)

Abstract- The permanent replacement of missing teeth in the maxillary posterior tooth region becomes a tedious task when it is confounded with bone atrophies. To overcome this problem and achieve successful rehabilitation, maxillary sinus membrane elevation procedures have been advocated as the most reliable means. The lateral window technique and the crestal approach are two of the most common approaches. These technologically developed procedures have reported high success rates in cases of deficient residual bone. Over time, there have been many advancements in these techniques that led to the development of user-friendly kits like the Lateral approach Sinus (LAS) kit and the Crestal approach Sinus (CAS) kit. In this case series, we have reported two cases, treated with either of these approaches and have compared the same.

Keywords: crestal approach sinus lift, hard tissue augmentation, lateral window approach sinus lift, platelet-rich fibrin membrane, transalveolar approach sinus lift.

GJMR-J Classification: NLMC Code: WV 345

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Lateral Approach Sinus (LAS) and Crestal Approach Sinus (CAS): The Unravelled Paraphernalia for Maxillary Sinus Membrane Advancement

LAS v/s CAS

Dr. Rinisha Sinha [α], Dr. Pranave P [σ], Dr. Aishwarya Sabharwal [ρ], Dr. Nidhi Saripalli [ω], Dr. Shiksha Dhawan [¥] & Dr. Nishita Bhosale [§]

Abstract- **The permanent replacement of missing teeth in the maxillary posterior tooth region becomes a tedious task when it is confounded with bone atrophies. To overcome this problem and achieve successful rehabilitation, maxillary sinus membrane elevation procedures have been advocated as the most reliable means. The lateral window technique and the crestal approach are two of the most common approaches. These technologically developed procedures have reported high success rates in cases of deficient residual bone. Over time, there have been many advancements in these techniques that led to the development of user-friendly kits like the Lateral approach Sinus (LAS) kit and the Crestal approach Sinus (CAS) kit. In this case series, we have reported two cases, treated with either of these approaches and have compared the same. We aim at highlighting their ease of application in the clinical field and the promising results obtained with their use. Our clinical experience disclosed that maxillary sinus membrane advancement using both the kits has proven to be a reliable technique for implant placement in sites where the insufficient bone is available.**

Keywords: crestal approach sinus lift, hard tissue augmentation, lateral window approach sinus lift, platelet-rich fibrin membrane, transalveolar approach sinus lift.

I. Introduction

Clinicians often face difficulty in placing implants in the posterior maxilla due to the commonly observed resorption after tooth loss, atrophy, or sinus pneumatization in the region, resulting in insufficient bone height.[1] A variety of solutions have been defined to overcome this quandary namely short implants, tilted implants, or maxillary sinus augmentation procedures. [2, 3]

Sinus floor elevation procedures are one of the popular, well-accepted, widely performed, and highly predictable procedure. Boyne and James[4] performed a two-stage implant placement procedure using the lateral approach for sinus lift in 1980. Tatum (1986) [5] entered the sinus via the edentulous alveolar bone and conducted vertical tapping through the alveolar ridge to elevate the sinus floor. Later in 1994, Summers [6]gave modification of this technique in the form of explicit osteotomes of diverseradii that could elevate the sinus floor, while simultaneously increasing the thickness of the bone.

In this case series, we have presented two cases that were performed using the CAS kit and LAS kit. The crestal approach sinus (CAS) kit (Osstem Implant Co., Busan, Korea)is an innovation that utilizes the crestal approach for elevating the sinus. It uses a unique drilling system in conjugation with hydraulic pressure. On the other hand, the lateral approach sinus (LAS) kit (Osstem Implant Co., Busan, Korea) allows a less invasive and less risky lateral window approach sinus augmentation using specific core and dome drills that helps in the formation of the bony window, while simultaneously elevating the Schneiderian membrane.

II. Case Presentation

All surgical operations were carried out under the influence of local anesthesia. First, a sub-crestal incision was made, that extended more than the edentulous site, in the mesio-distal direction. Then, using molt #9 periosteal elevators, a full-thickness mucoperiosteal flap was raised (HuFriedy, Chicago, USA). One-stage implant placement was performed for both the cases (with the LAS kit and the CAS kit). Both the procedures involved the application of xenograft (Cerabone, Biotiss, Germany) for bone augmentation and B&B implants (San Benedetto, BO, Italy) for the replacement of the teeth.

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Case report 1

A female aged 29 presented with the complaint of missing teeth in her upper right back tooth region for 3-4 years and desired the replacement of the same. Her CBCT revealed an enlargement of the maxillary sinus with a bone height of 2.55 mm at the desired site (Figure 1). Therefore, a sinus lift procedure using the lateral approach was indicated before implant placement and we accomplished it with the help of the LAS kit.

After the surgical preparation mentioned above, a one-stage implant placement technique was carried out. The flap was extended up to the inferior border of the zygoma, to allow the visibility of the lateral wall of the maxillary sinus. The lateral window was created using the dome drill of 5.0 mm diameter with a stopper system (0.5mm increments) for effective depth control. When the maximum desired depth was achieved with the 0.5 mm drill stopper, it was changed to a 1.0 mm stopper, and drilling was proceeded chronologically while scrutinizing for any perforation. The drilling of the osseous wall continued with increasing depths and stoppers till full penetration of the lateral wall was achieved and the bony window was removed in-toto (Figure 2). Sinus curettes were then used to gently lift the sinus membrane by moving it between the membrane and bony wall anteriorly, posteriorly, and medially. Once the membrane was free of all the attachments, we encountered the movement of the membrane that was concomitant with the breathing.

The osteotomy was then prepared into the ridge and an implant of the desired length was placed and the cover screw was tightened (Figure 3). After that, the apical portion of the implant was packed with a xenograft (Cerabone, Biotiss, Germany). The bony window, that was cut out, was placed back in the position and was covered with a PRFmembrane. Primary closure of the soft tissue was obtained. The flap was repositioned with a non-absorbable braided suture, first with horizontal mattress sutures, and, then with interrupted sutures to seal the crest (Figure 4). Postoperative instructions were provided to the patient (Table 1).

The patient was recalled after 10 days and then 3 months later. The soft tissue confirmed no inflammation and satisfactory wound healing. The radiographic analysis verified the densification of the xenograft and the osseointegration of the implant (Figure 5).

Case report 2

A 44-year male patient desired the replacement of a grossly decayed tooth in his upper right back teeth region. The CBCT revealed a reduced bone height of 8 mm (Figure 6). Minimal atraumatic extraction of the maxillary right first molarroot piece was performed before proceeding with the implant surgery. Then, the osteotomy was started with a 2.0 mm diameter twist drill from the CAS kit. It was used along with the stopper. It was then followed by the drills with increasing diameter upto 1 mm short of the sinus floor with a drilling speed of 800 rpm. Then, the 3.6 mm bur was used for the extension of the osteotomy, perforating the sinus floor. The integrity of the membrane was analyzed with the depth gauze while slightly lifting the membrane. Then, the hydraulic hoist was implanted and steadied into the drilled hole and the saline solution was injected. 3 mm sinus floor elevation is expected by using 0.30 mL solution. [7]It was then drowned out and injected again until the anticipated advancement was achieved. The xenograft was condensed with the help of the carrier and condenser. It was then followed by implant placement using the self-tapping method and the cover screw was placed (Figure 7), followed by adequate soft tissue closure. The patient was instructed with proper oral hygiene instructions and was recalled after 10 days for suture removal. A healing abutment was used to replace the cover screw after four months. And by the end of the 4th month, the final prosthesis was delivered (Figure 8). The patient is being followed up for 1 and a half years now and has shown satisfactory results.

III. Discussion

Successful implant surgery is attained only if the implants are placed in a sufficient and decent quality of bone for its proper osseointegration. Because of low bone quantity and quality, as well as its closeness to the sinus floor, the maxillary arch has traditionally been one of the most challenging places to properly insert dental implants. Thus, Sinus lift surgery, also known as sinus augmentation, helps to correct these problems by elevating the sinus floor, forming space for an appropriate bone graft material to help in the formation of new bone for successful treatment. Several approaches are being used to reach this goal.

When there is less than 5 mm bone height available, the lateral window sinus lift procedure is recommended. [8] The Schneiderian membrane may be seen directly through the lateral window. [8] Nevertheless, it is more intrusive, results in postoperative pain, and difficulties, and has a higher infection risk. [9, 10] This procedure might cause rupture of the sinus sheath, further allowing microbial adulteration into the sinus.

In another scenario, when the remaining maxillary bone height is greater than 5 millimetres, a transalveolar sinus elevation technique is frequently needed. [8] Since Summers [6] proposed the osteotome technique in 1994, it has been applied widely with the advantage of being an effortless procedure, with a briefer therapeutic period than the conventional lateral hole-in-the-wall technique. However, if it is performed improperly, it might cause compression necrosis or breakage of the cortical wall. [8-11] Various

studies have been carried out which revealed that the rate of perforation using the osteotome technique was 3.8%, and the subsistence rate of the implants was reportedly 92.8%. [12] Thus, the risk of perforation or formation of an excessive bony cavity at the implant placement area led to the jeopardy of the implant stability in the preliminary stage along with numerous hitches post-operatively. The crestal approach, however, offers many advantages over the lateral approach. It is less aggressive and a relatively simpler procedure, facilitating early wound healing than the lateral approach. As it is a “blind” procedure, it is heavily dependent on the skills of the clinician and might cause Schneiderian membrane rupture while malleating. [11-14] Additionally, this procedure leads to complications such as pain in the head and light-headedness after the procedure. [1, 2, 15, 16]

Sequentially, two new devices were developed for both the lateral (LAS kit) and crestal (CAS kit) approach sinus lift and gained immense success over time. According to our knowledge, literature has never discussed both of these techniques together and therefore, we attempted to club our cases, experiences, and literature together to achieve the same.

'Dome' and 'Core' drills, metallic stoppers, and a bone separator tool are included in the lateral approach sinus kit (LAS Kit) (Osstem Implant Co., Busan, Korea). The Dome drill is a one-of-a-kind osseous drill that removes the maxillary sinus's lateral wall while collecting autogenous bone to be put into the sinus (Figure 9). Macro- and micro-cutting blades cut the lateral wall cleanly without rupturing the sinus membrane. These Dome drills are of 5.0- and 7.0-mm diameters and are used with an operating handpiece at 1,200 to 1,500 RPM along with ample irrigation. The metal stoppers (0.5, 1.0, 1.5, 2.0, 2.5, and 3.0 mm), to control the penetration depth, are used sequentially for the safe elevation of the sinus membrane while having restricted penetration depth. The Dome drill can be used to expand the osseous window generated by the side wall drill if required. The flat tip of the drill is planned for innocuous advancement of the sinus membrane. Osseous cutting is done with the side of the spinning drill at 1,500 RPM, in presence of copious irrigation, to increase the size of the window. It can be used with metal drill stoppers to avoid inadvertent penetration into the sinus membrane.

The Core drill, like the Dome drill, is available in 5.0- and 7.0-mm diameters. Its center does not cut with bone removal, leaving a bone core over the sinus. This bony lid can be lifted and employed as the new 'roof' of the sinus, with osseous augmentation put beneath it, while the sinus membrane remains attached. Metal drill stoppers allow for regulated depth preparation in a sequential manner. If removal of the osseous core created by the Core drill is desired, the bone separator tool is used to separate it using the practitioner's preferred technique.

When less bone height is present, a lateral window approach was preferred to increase crestal bone height and volume for successful implant placement. [8] The lateral sinus augmentation approach can be challenging as rupturing of the sinus membrane often necessitates abandoning the procedure and re-entering at a later date after the completion of the healing. The older techniques involved the use of diamonds or carbides in a high speed handpiece or the use of Piezosurgical units. However, these approaches had the potential for membrane damage (burs at a high speed) or were very slow (Piezo). The LAS kit, from Osstem, employs particularly designed drills that curtail the membrane damage, thereby, refining the safety of the technique. The advantages of LAS-KIT include its convenience, potential to eliminate the number of steps involved in the surgery, highly versatile drill design - allowing it to be used on sinus floors that are flat, inclined, or over a septum, reduction in overall chair time, complications, and patient discomfort, and the adaptable LAS-drills, which can acclimatize with quite a few diverse bone solidities.

The CAS kit includes two types of drills, one of which is the twist drill. It can be coupled with a stopper for the initial drilling. Stoppers ranging in length from 2.0 mm to 12.0 mm are included. (Figure 10). The maximum depth of the twist drill is 2.0 mm from the sinus floor with a speed of 1,000 to 1,500 rpm. The CAS drill is the other sort of special drill. Because the CAS drill tip is conical, the bone is drilled with a conical hole. The dentist can safely raise the sinus membrane using the CAS drill. Furthermore, because the CAS drill rounds the lateral side, it may be utilized safely on numerous types of maxillary sinuses. The CAS drill also can gather autogenous bone, and its optimum speed range is 400–800 RPM. The depth gauge may be used to examine membrane elevation and quantify residual bone height. It's also necessary to attach it to a stopper. A 1.0-mL syringe filled with saline solution is fitted to the hydraulic lifter.

The bone carrier, condenser, and spreader are employed for jawbone transplantation. The bone carrier is available in 3.5 mm and 3.9 mm sizes. It's made up of little pieces of bone. The condenser is used to plug the osteotomy with the xenograft, while the bone spreader is used to spread the bone graft material laterally to achieve desired sinus raise, at a low speed of 30 rpm.

The CAS kit was originally designed to uplift the maxillary sinus sheath safely using the hydraulic pressure. However, only 75 % of dentists have reported the routine use of the hydraulic lifter for the elevation. [7] Kolhatkar et al. [12] and Teutsch et al. [17] testified 97% success rate for the crestal approach. It is in our opinion that the expected advancement can be safely achieved through the crestal approach with a reduced bone

height. But the literature [7] suggests that the hydraulic lifter in the CAS kit was not a very user-friendly component. The respondents to the survey desired further developments or modifications of sinus lift devices to make them safer and more user-friendly. The cause of the advancement was thought to be due to the pressure of the saline injected through the hydraulic lifter. [18]

We also have mentioned the use of PRF membrane, rather than using any other resorbable membrane because it helps in healing the wound, protecting the surgical sites, assisting soft tissue repair, and with bone graft, acts as a "biological connector." Also, the suturing technique used resisted any kind of soft tissue tension that might have resulted due to inflammation and puffiness following surgery. Supplementary simple interrupted sutures were also positioned for proper closure of the site.

IV. Conclusion

Pneumatization of the maxillary sinus because of the lost maxillary posterior tooth prevents implant placement in the respective region. Thus, sinus floor advancement and increase in the density of the bone provides a predictable treatment for the regeneration of the lost osseous structure in the posterior maxilla. Most of the clinicians are generally satisfied with the use of these kits in their daily practice as it holds a number of advantages. However, both have limitations that require developments and modifications to make them safer and more user-friendly.

Conflict of Interest

The authors declare no potential conflicts of interest with respect to research, authorship and/or publication of this article.

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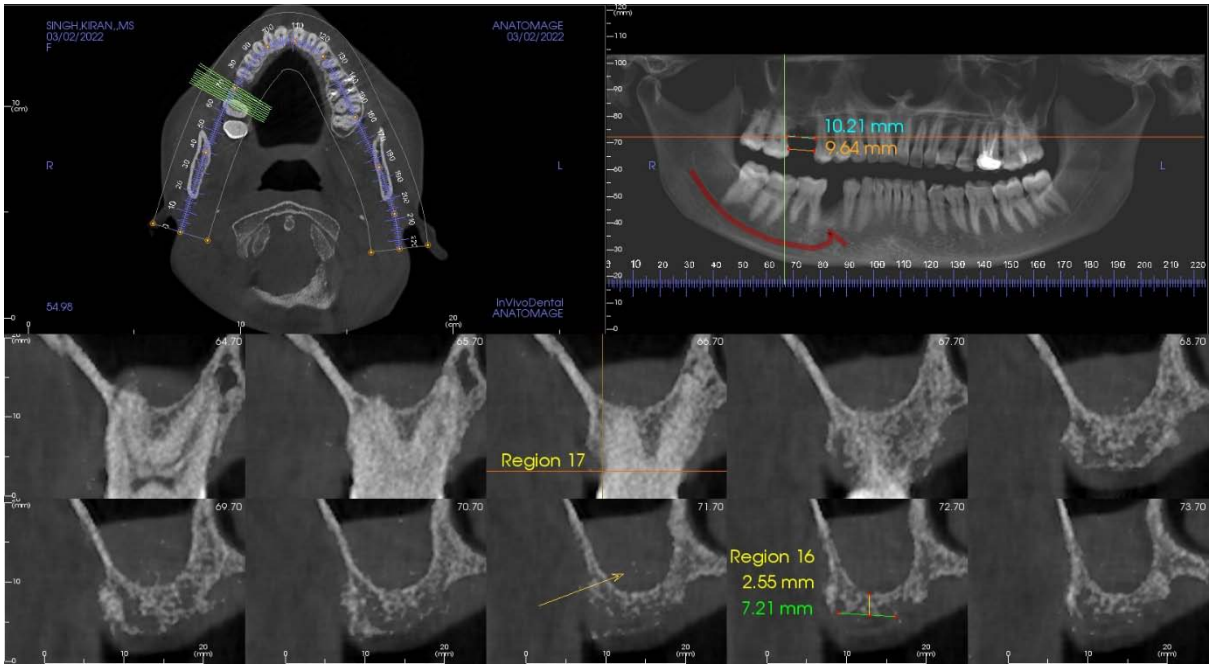

Figure 1: CBCT revealing the readings for the edentulous site

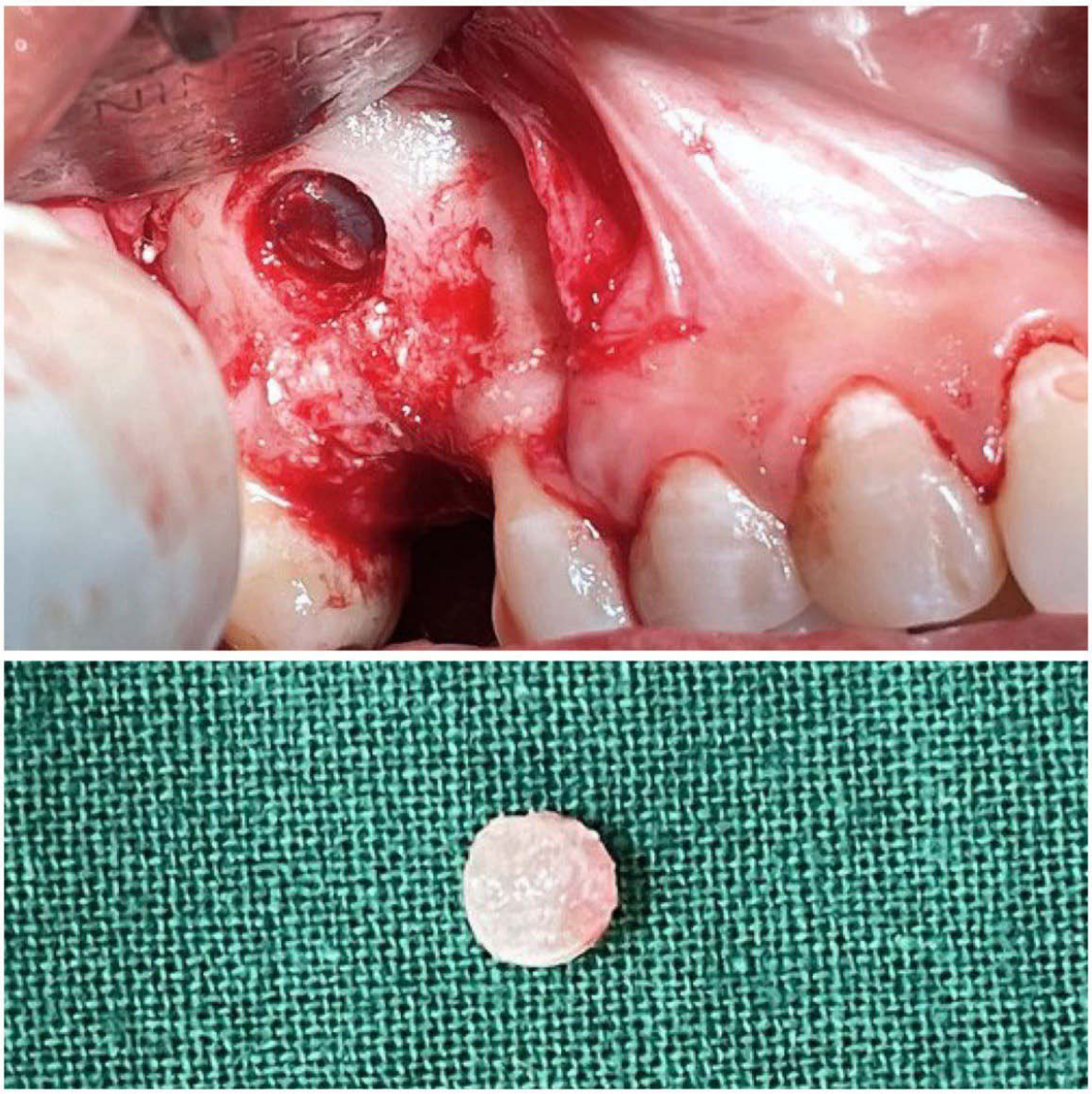

Figure 2: In-toto removal of the lateral bony wall (below) revealing the sinus membrane (above)

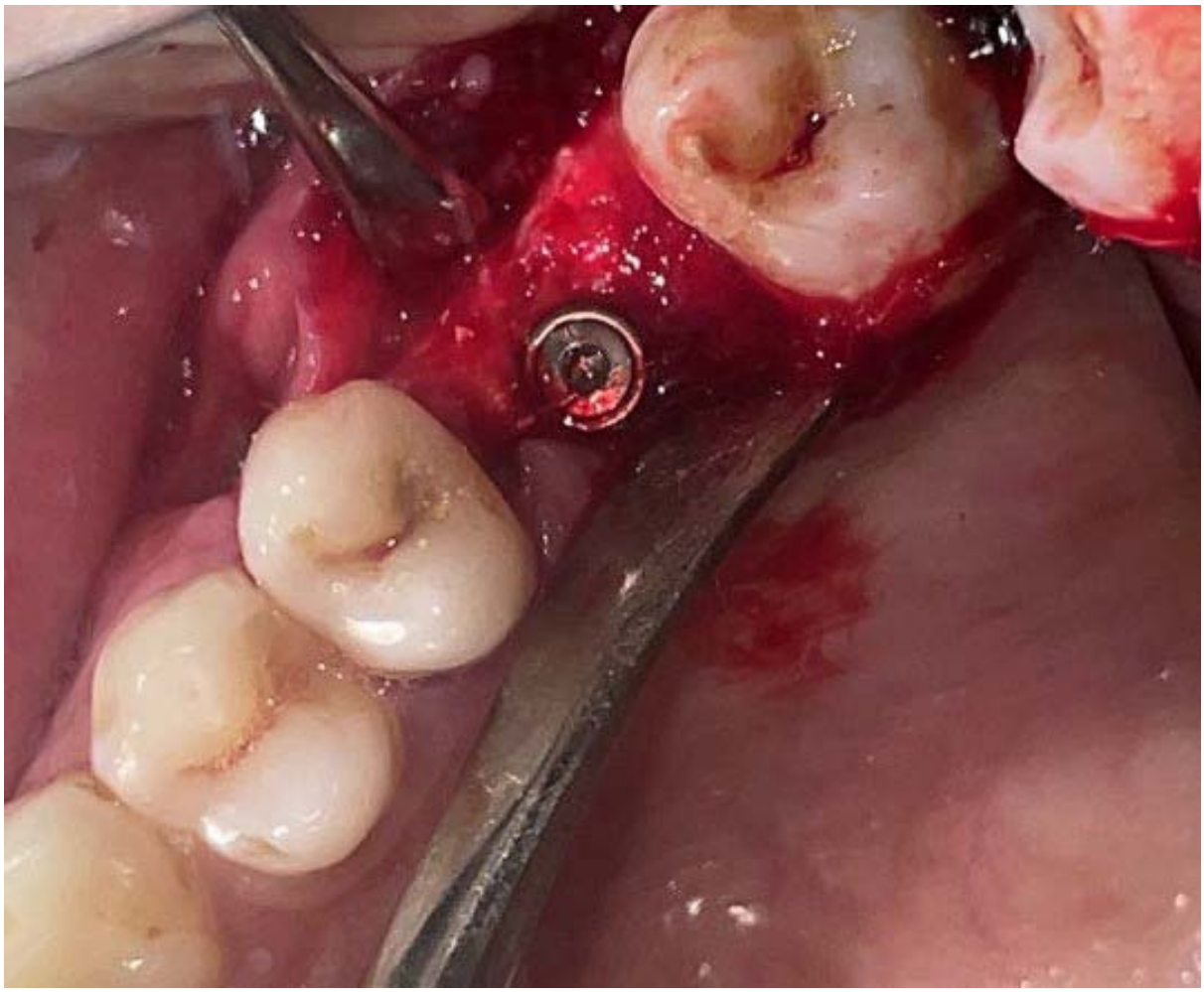

Figure 3: Implant placement done followed by sinus lift procedure

Figure 4: Soft tissue closure obtained

Figure 5: RVG revealing successful osseointegration of the implant

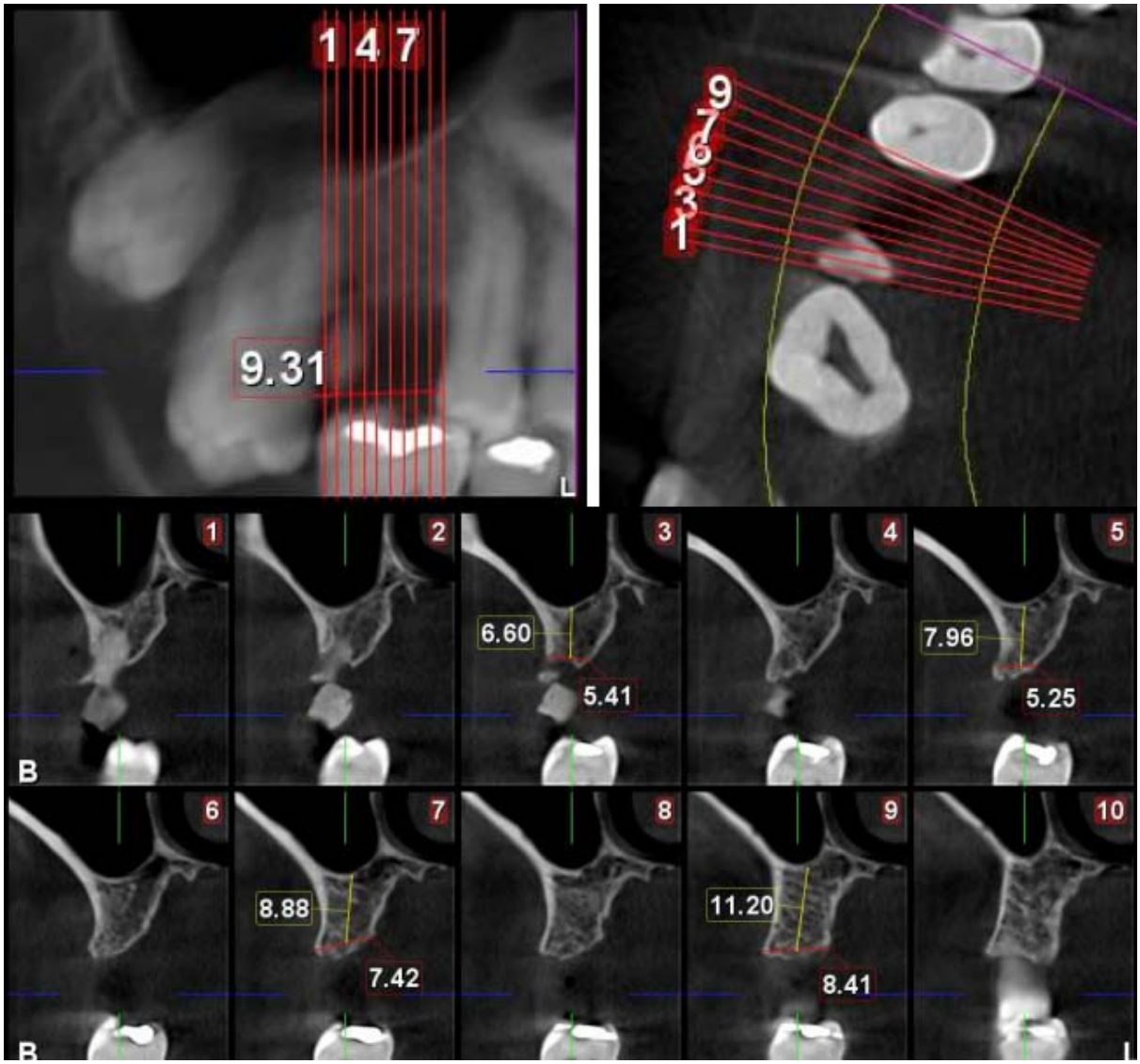

Figure 6: CBCT showing the edentulous site

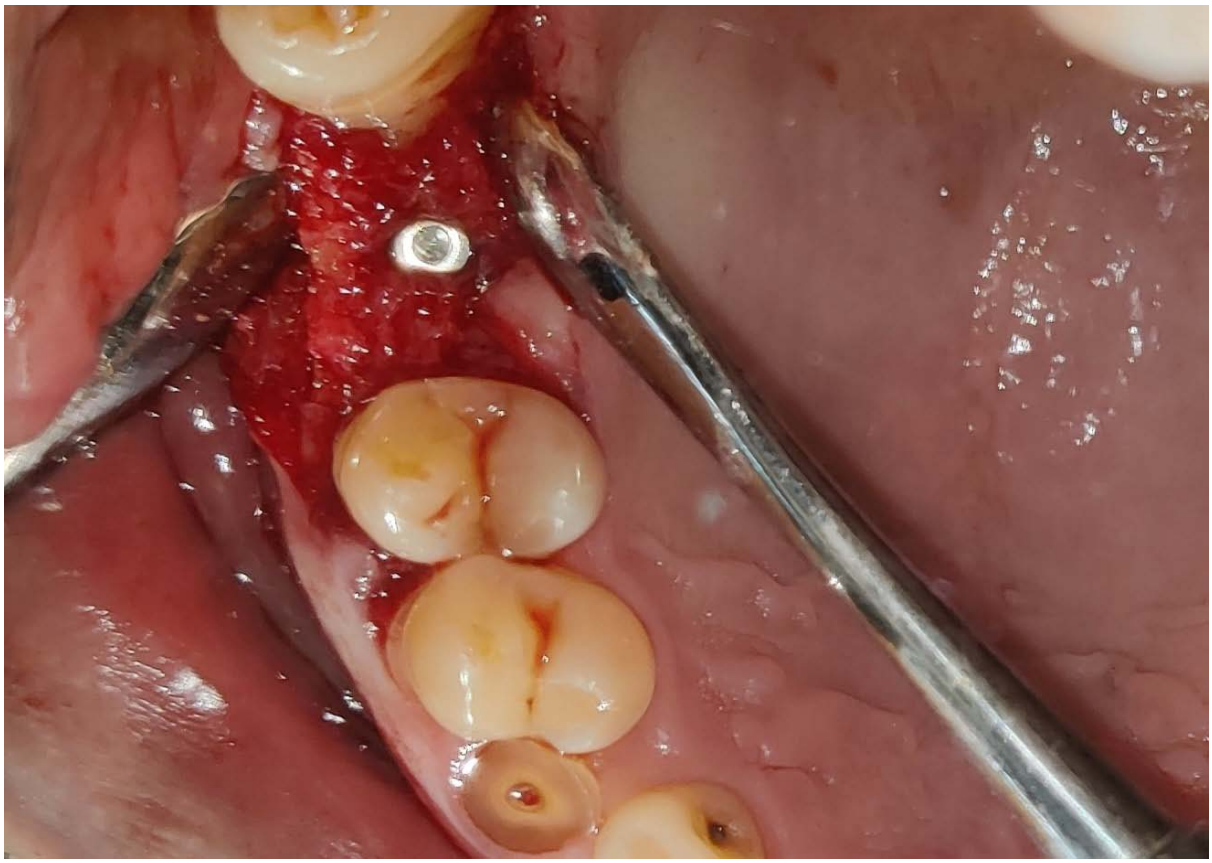

Figure 7: Implant placement followed by sinus lift procedure using CAS kit

Figure 8: Pre- (above) and post-surgical (below) clinical photograph

Figure 9: Lateral Approach Sinus Lift Kit

Figure 10: Crestal Approach Sinus Lift Kit

Table 1: Instructions to the patient post-treatment
The patient should be informed that on the first night after surgery, the head should be elevated with the help of pillows.
The patient should be advised to take a liquid diet for 2 days and then, a soft diet for 2 weeks.
The patient should be updated about some nasal bleeding that might occur during the first day after the procedure.
Medications to be prescribed to the patient – • Augmentin 625 mg BID for 10 days; • A combination drug of aceclofenac, paracetamol and serratiopeptidase QID for 3 days; • Otrivin nasal spray for 7 days; • Chlorhexidine mouthrise 30 mL BID for 14 days
The patient should be counseled to avoid • chewing from the treated site, • nose propelling movements for 2-3 weeks, • tobacco smoking, cigar smoking, etc. • gusting of balloon, or any other similar activity, • drinking using a straw, • flying in pressured aircraft or scuba diving, • drinking beverages with effervescence (minimum 3 days), • the heavy lifting of weights, and • playing musical instruments that require blowing. Actions that produce negative pressure must be avoided throughout the first week after surgery. They should be directed to sneeze with the mouth open so that the pressure is not exerted within the sinus.
The patient should be made aware that some bruising, and facial swelling might be expected underneath the eye. For its resolution, the patient should apply cold packs over the surgical site extraorally for an on and off way (of 10 minutes each).

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Global Journals is in partnership with various universities, laboratories, and other institutions worldwide in the research domain. Authors are requested to disclose their source of funding during every stage of their research, such as making analysis, performing laboratory operations, computing data, and using institutional resources, from writing an article to its submission. This will also help authors to get reimbursements by requesting an open access publication letter from Global Journals and submitting to the respective funding source.

Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for writing a good quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.

Criterion for Grading a Research Paper (Compilation) by Global Journals

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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