MULTIDISCIPLINARY ORAL REHABILITATION WITH ALTERED VDO

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PATIENT BACKGROUND

NAME: MITCHELL

CC: SEVERE COLD AND HOT SENSITIVITY ON LOWER TEETH, WANTED A CHECK-UP

AGE/SEX: 57/M

HPI: HAD ALL UPPER TEETH CROWNED IN 2017-18

MEDICAL HX: PTSD, ANXIETY, "BORDERLINE" DIABETIC TYPE II (09/2021), AND HYPERCHOLESTEROLEMIA → PT WAS REFERRED BY A STUDENT DENTIST TO MD FOR AN HBA1C BLOOD TEST

- 12/2021 → DX WITH DM TYPE II (HBA1C WAS 9.7%)
- 03/202→ HBA1C WAS 6.9%
- 08/2022 → HBA1C WAS 6.6%

MEDICATIONS: ATORVASTATIN, CITALOPRAM (ANXIETY), SINCE 01/2022 METFORMIN - CHANGED DOSAGE FROM 500 TO 1000 MG X 2D

SOCIAL HX: PT IS A VETERAN, LIVES WITH HIS MOTHER IN SAN FRANCISCO, AND LIKES TO LIFT WEIGHTS AT THE GYM

HABITS: NON-SMOKER, SOCIAL ETOH USAGE, HX OF RECREATIONAL DRUG USAGE

ASA: III → II

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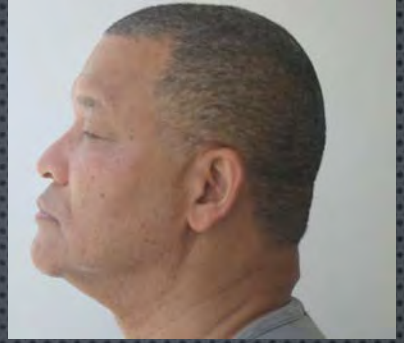

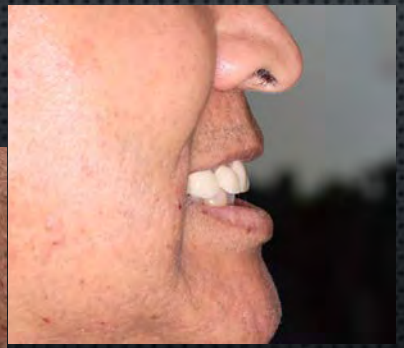

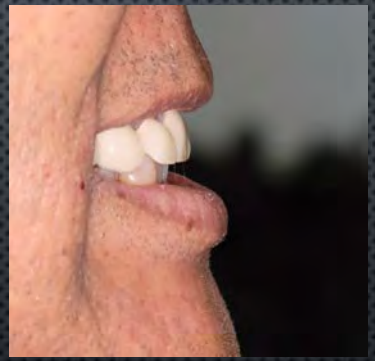

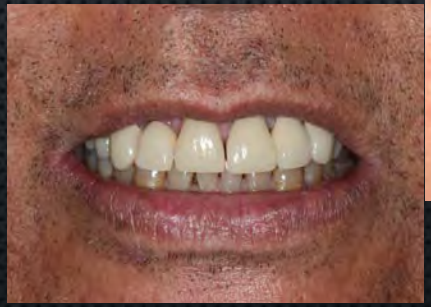

EXTRAORAL PHOTOS

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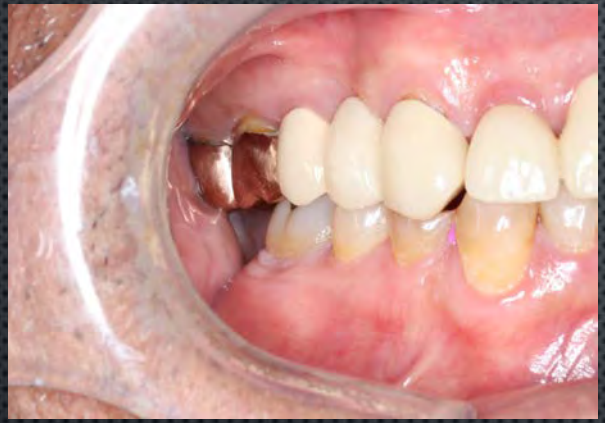
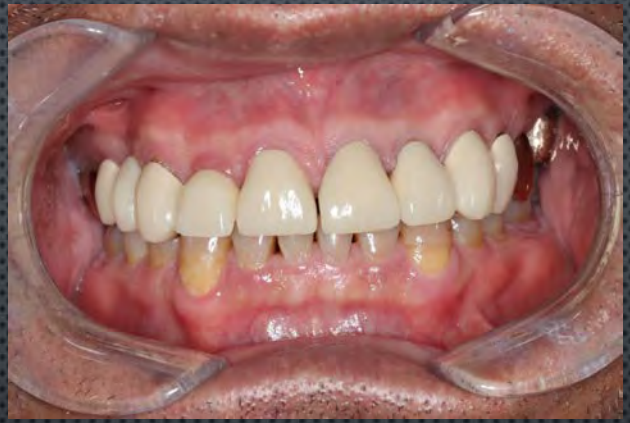
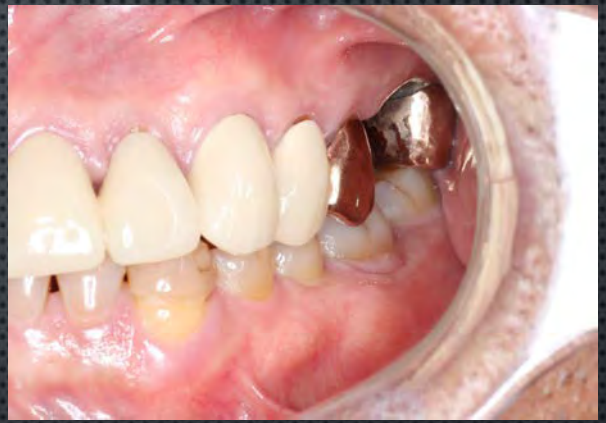

INTRAORAL PHOTOS AFTER 4 QUADRANTS SRP AND AN EMERGENCY EXTRACTION #14

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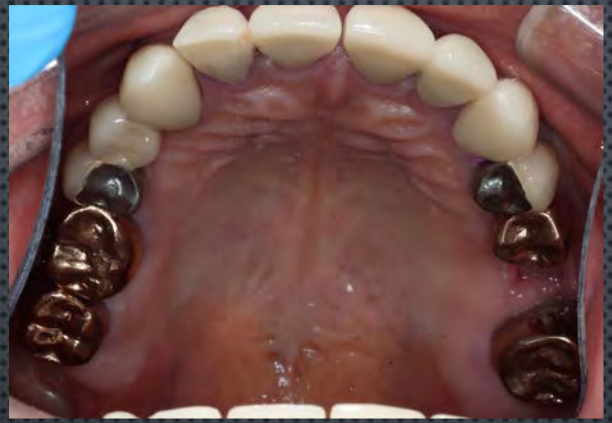
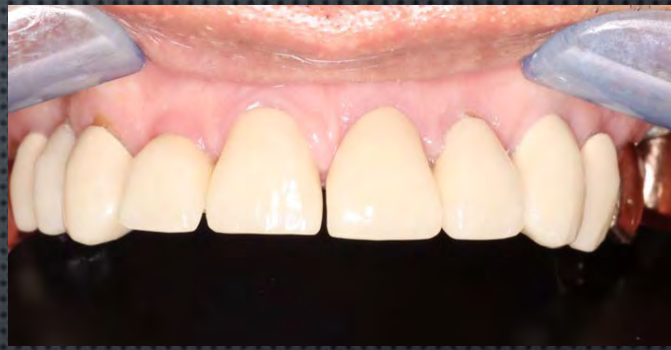
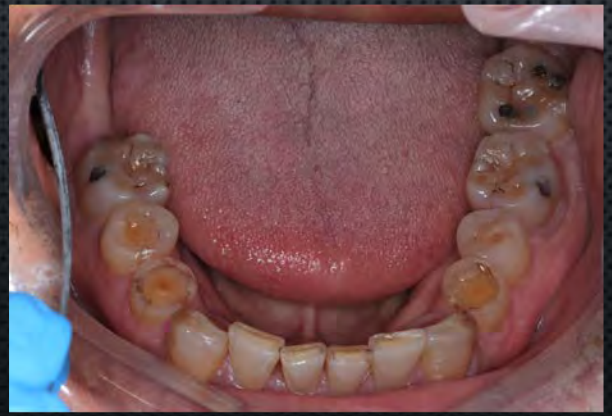
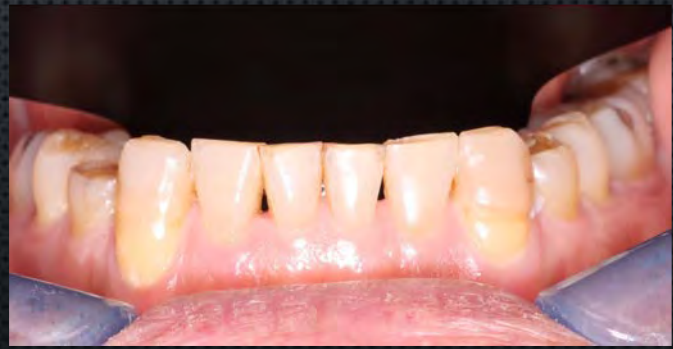
INTRAORAL PHOTOS AFTER 4 QUADRANTS SRP AND AN EMERGENCY EXTRACTION #14









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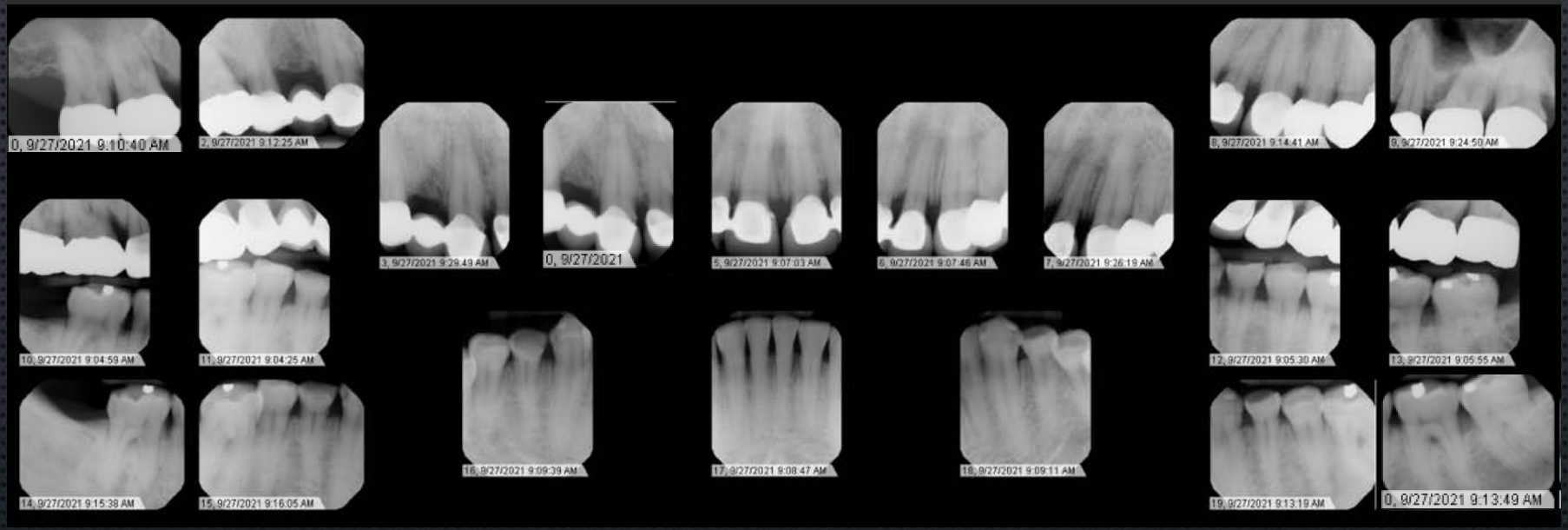
FWX 9/27/2021



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DENTAL FINDINGS

#1 Missing

#2 FGC

#3 FGC- open M margin

#4 PFM abutment crown for bridge - DM open margins

#5 PFM pontic

#6 PFM abutment crown - DM open margins

#7 PFM crown, splinted with #8 - DMFL open margins

#8 PFM splinted with #7 - DMFL open margins

#9 PFM splinted with #10 - MF open margins

#10 PFM splinted with #9 - MF open margins, F abfraction

#11 PFM crown - D open margin

#12 PFM crown - M open margin

#13 FGC - open D margin

#14 - FGC

#15 FGC -open DBL margins

#16 Missing

#17 missing

#18 OB amalgam, O comp, ICDAS 2, vertical craze lines

#19 B amalgam, O wear, DL cusp chip

#20 O wear, vertical craze lines, attrition/erosion

#21 Severe O wear (dentin show through), vertical craze lines, M chip

#23-26 I attrition, vertical craze lines

#27 DL comp, recurrent decay F

#28 Severe O wear(dentin show through), vertical craze lines, M chip

#29 O wear, vertical craze lines, chip on L cusp

#30 B amalgam, O attrition/erosion, ML & DL cusps chipped, ICDAS 2

#31 Missing

#32 Missing

PFM crowns are overcountoured with open margins, compromising periodontal health

Plaque index 1.7

Caries Risk: High (ATP 4851, active caries)

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PERIODONTAL FINDINGS

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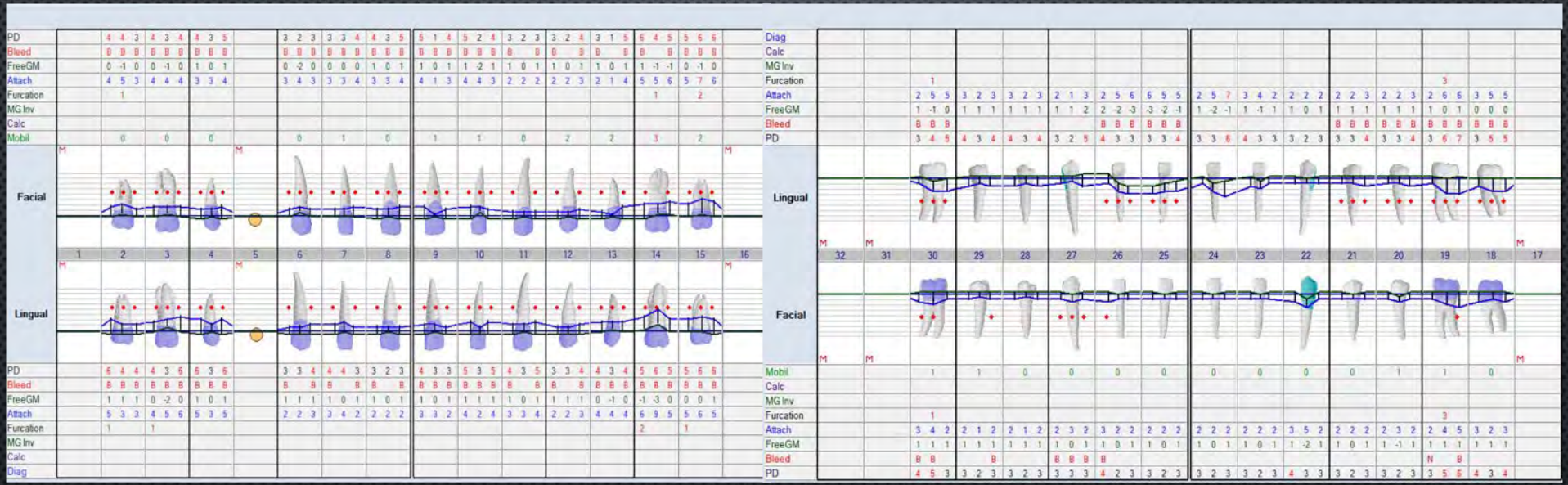


Localized mobility slight on #7,9,10,18, 20, 29, 30; Moderate on #12, 13, 15, 19; Severe #14

Moderate generalized horizontal bone loss, with localized severe vertical bone loss #3 M, 5 M, 14 MD, #19 D; Furcation involvement on #2, 3, 14, 15, 19 (#19 was corrected to class II later)

Heavy supragingival and moderate subgingival calculus with remaining subgingival cement around upper crowns

PERIODONTAL DIAGNOSIS AND PROGNOSIS

Periodontal Dx: Stage III Grade C (Moderate generalized chronic periodontitis with local contributing factors/active)

Etiology: primary - bacteria, plaque; secondary - overcontoured restorations with challenge to clean between splinted crowns, systemic disease (DM T II - was initially uncontrolled), traumatic occlusion possibly

Prognosis: poor → **hopeless** #14; **poor** for #15; **guarded** for #2, 19; **fair** #7, 9, 10, 12, 13, 18, 20, 30.

TMJ ASSESSMENT

- A slight deviation to the right on opening
- Non-painful
- Asymptomatic
- No popping or clicking
- Unable to make bilateral laterotrusive movements due to overcontoured lingual surface of maxillary canines
- Hypertrophic masseter on the right side – was recommended home massages and warm compresses to relax the muscle
- Parafunctional habits:
  - Clinching/ bruxing
  - Deviate the mandible to the right when focused

DENTAL DIAGNOSIS AND PROGNOSIS

Dental Dx: High caries risk with active caries, open margins on existing crowns. Signs of grinding/clenching habit due to moderate to severe attrition of lower natural dentition with signs of occlusal erosion and generalized craze lines.

Occlusal Dx: Group function occlusion with inability for smooth bilateral laterotrusion due to overcontoured upper canine restorations.

Overall prognosis is good with stabilization of periodontal disease, regular cleanings, good home oral hygiene, lowering caries risk, improvement of the contour and fit of maxillary crowns, corrected VDO and occlusal scheme.

OCCLUSAL, SMILE, AND FACIAL ASSESSMENT

Low lip (smile) line

Straight facial profile

Midline deviation to the left 2 mm

Molar classification Right Class I: Left Class III

Canine classification: Class I Right and Left

Group function guidance

Anterior teeth **OJ: 5 mm**, OB 3 mm

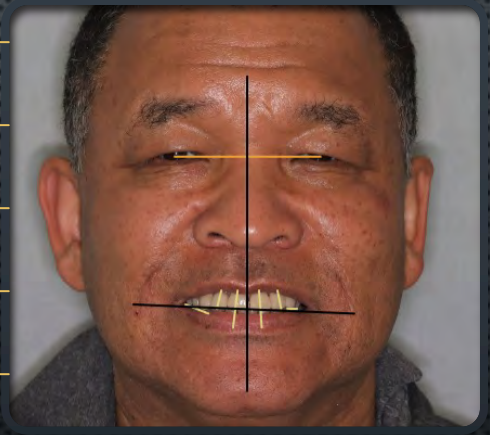
CR minimal shift to MI (less than 0.5mm)

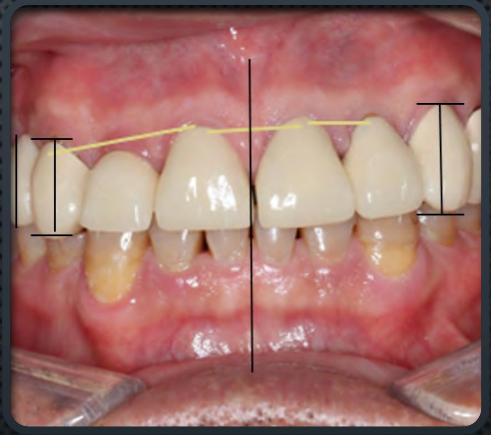
#7 is facially inclined and **3 mm shorter than #10** due to #27 interference

Gum line uneven on #7 Facial 2-3 mm lower then #8

Left upper **teeth are 2 mm longer than right** upper teeth,

#21 & 28 are short due to occlusal wear (3-4 mm height from gingiva)





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GOALS OF THE TREATMENT

Stop	Stop the progression of periodontal disease and improve periodontal health
Reduce	Reduce caries risk
Prevent	Prevent future wear of natural lower dentition
Replace	Replace missing teeth
Improve	Improve occlusion
Esthetics	Improve smile by giving it a “natural” balanced look
Preserve	Utilize a conservative dental approach

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ACCEPTED TX PLAN

I - Urgent phase:

- Extraction #14

II - Disease control phase

- 4 Quadrants S/RP, OHI
- CTx4 rinse
- #27 DF composite
- Extraction #3 + PRF w/ Bone graft
- Extraction #15
- #19 Osseous periodontal surgery w/ bone grad

III – Reconstructive phase

- Smile design wax-up made by the student
- #4-6 PFZ bridge
- Smile design provisional restorations made by student
- #7 PFZ + Gingivoplasty with #27 F enameloplasty
- #8, 9, 10, 11, 12 – PFZ crowns
- #13 BuP + PFZ crown
- #21 and #28 FZC
- Vertical sinus lift UR w/ bone graft and immediate implant placement #3
- Vertical sinus lift UL
- Implant crowns #3 and #14

IV- Maintenance phase

- CTx3 rinse after ATP <1500
- 5,000 Provident toothpaste
- SPT every 4 months
- Lower occlusal guard

Pt preferences:

- No removable appliances
- Tx budget under $20K
- "Natural" look

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Alternative tx plan #1
Implants #3, 5, 14

Instead of the bridge #4-6 → #4 and #6 single crowns and #5 implant

Total cost:

+ $3,000

Alternative tx plan #2
Implants #3, 14 and cantilever crown #15

Instead of ext #15 and shorten dental arch → #14 implant crown with distal cantilever #15

Total cost:

+ $4,500

Alternative tx plan #3

Upper PRD

Instead of implants #3 and #14 upper partial to replace missing teeth

Total cost:

- $7,500

Alternative tx plan 4

Monolithic zirconia crowns

Instead of upper PFZ crowns → Monolithic Zirconia Crowns

Total cost:

same

Alternative Tx plan #5

If anterior teeth are non-restorable

Ext #7-10

PFZ bridge #6-11

Total cost:

+ $3,500

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RATIONALE FOR TX PLAN AND SEQUENCING

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Since **we did** not know what is underneath the existing crowns and **if teeth are restorable**, we made the decision to **remove all the existing crowns** at once **to finalize the tx plan**.

The **concern** was about **anterior teeth restorability**. The alternative tx plan(in case #7-10 are non-restorable) was to have #6-11 PFZ bridge made and #5 implant with #4 single PFZ crown.

CBCT was taken after existing#4-13 crowns were removed to reduce scattering effect.

In consideration of the **patient's bruxism**, **wear history**, and **patient's esthetic desires** specific restorative materials for the definitive prostheses were selected carefully.

Reasons for increasing VDO by 1 mm: 1. To gain space for restorative material (prosthetic convenience) and 2. To improve esthetics without increasing functional risk.

We improved esthetics by giving a "natural" look to the crowns and not compromising too much on their strength with low risk of wear of opposing natural dentition. We chose porcelain-veneered zirconia crowns for #4-13, monolithic zirconia crowns for #21 &#28, and MZ implant crowns for #3 and #14.

#15 planned for extraction after restoration of implant #3. However, after placing #14 implant OS recommended to keep #15 as long as possible in order to retain proprioception on UL side. Crown on #2 was not replaced since #2 has guarded periodontal prognosis and the margins are acceptable. Considered having a shorten dental arch on LR and keep #2 from s supraeruption with the lower occlusal guard

PRESENTATION OF DENTAL WORK IS IN CHRONOLOGICAL ORDER OF THE TREATMENT RENDERED

- **ESTIMATED TIME** TO COMPLETE THE CASE: **2 – 2.5 YEARS**;
- STARTED CASE ON 09/23/2022;
- EXPECTED TO COMPLETE THE CASE IN 12/2023;
- **ACTUAL TOTAL TIME** FOR COMPLETION: **1 YEAR AND 3 MONTHS**

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CHRONOLOGICAL TIMELINE OF THE TX RENDERED

1. Periodontics 01-02/ 2022

SRP all 4 quadrants - 01/2022

- ITE - 02/2022 -
- #3. #14, #19, periodontal surgery proposed for pocket reduction OR ext #14 due to poor prognosis **- pt refused the proposed Tx.**

2. Caries control + direct restorative, 02-03/2022

CTx4 - Jan 2022

- #27 F comp - 03/1022
- Pt left the country until 08/2022. Pt refused the proposed Tx plan due to waiting on VA insurance

3. Oral surgery 08/2022

ER extraction #14

- Pt came with a toothache #14, PA showed severe bone loss around #14 with class III mobility

4. 2nd ODTP + SPT 09/2022

2nd ODTP - pt accepted and committed to the comprehensive Tx

- ext #3 was proposed due to poor prognosis
- SPT was completed 09/02/2022

5. Extraction #3 + PRF + bone graft

Extraction #3 + PRF + bone graft

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ITE COMPARISON OF BOP AFTER 4 QUADRANTS SRP

- SIGNIFICANT IMPROVEMENT ON BOP AFTER SRP TREATMENT. HOWEVER, UL STILL HAD BOP AROUND #13-15

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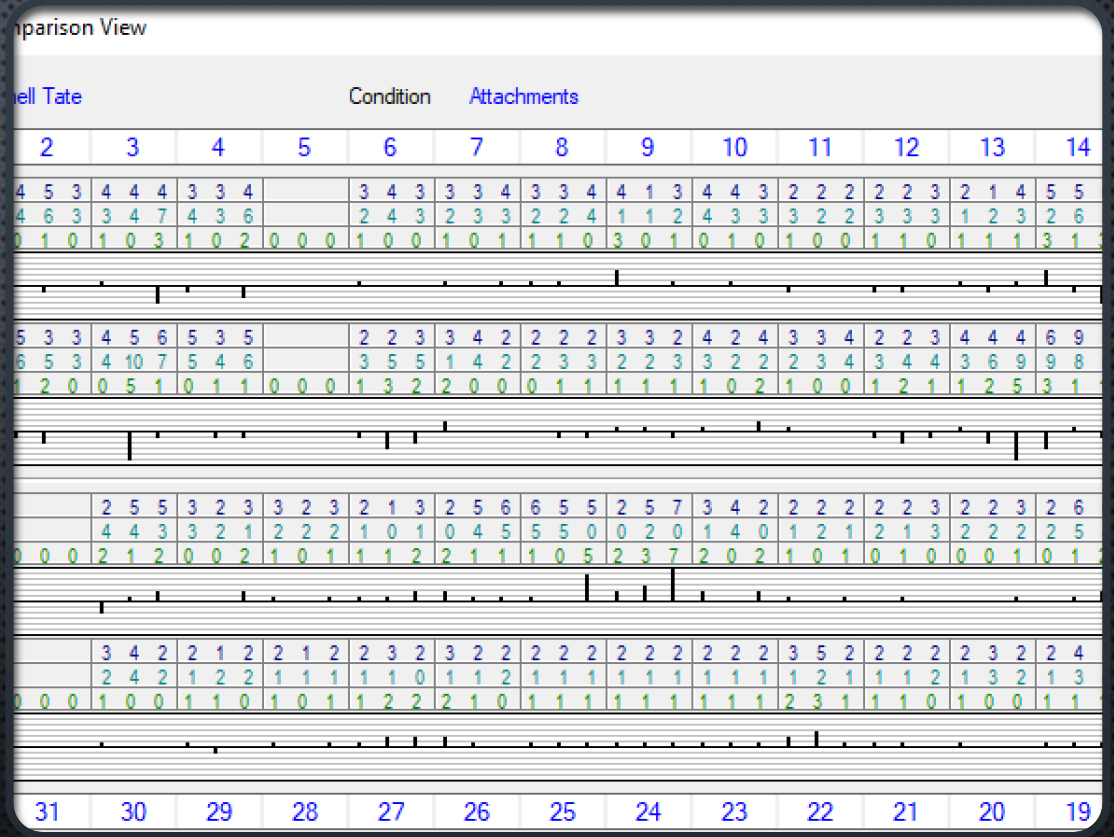
ITE COMPARISON OF CLINICAL ATTACHMENT AFTER 4 QUADRANTS SRP

- We see some increase in attachment loss, especially around teeth #3, 14, 15.



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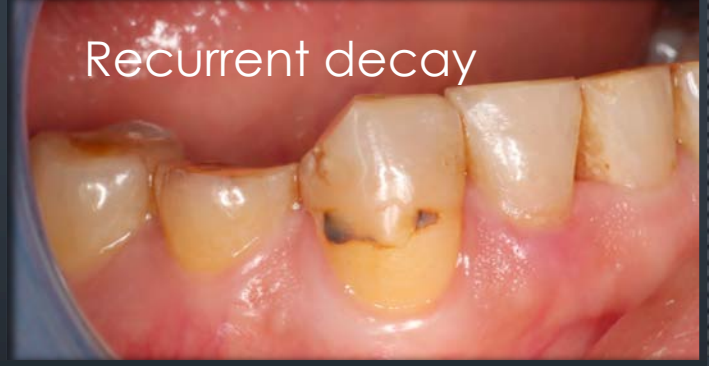

COMPOSITE RESTORATION #27

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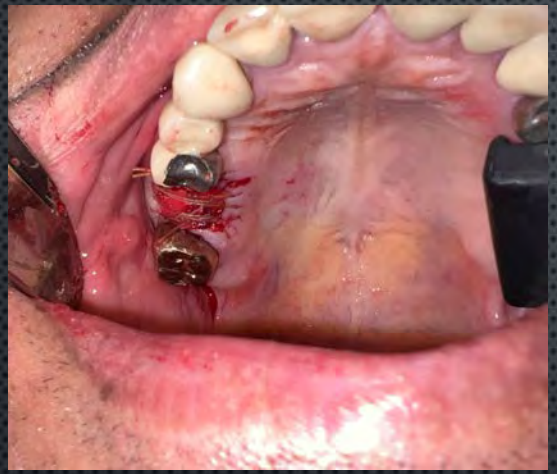
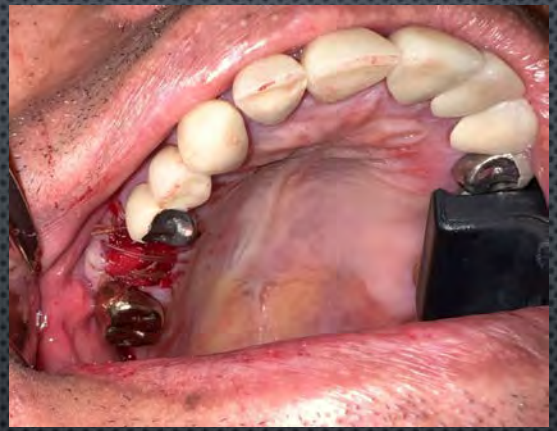
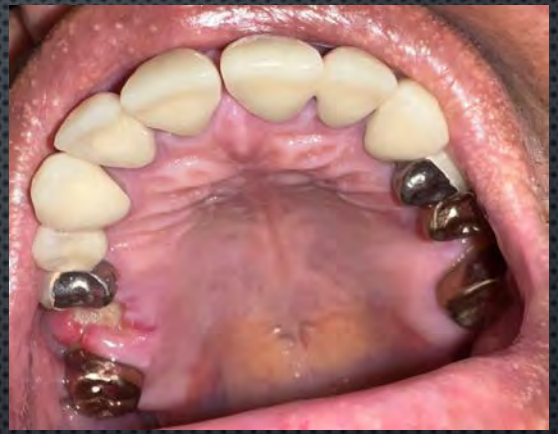


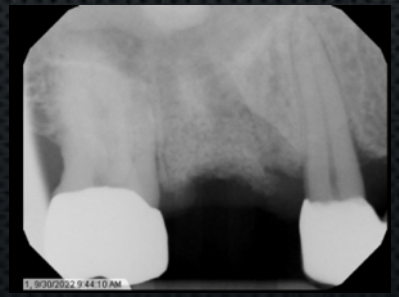




Right after the extraction

1 week post op

EXTRACTION OF #3 W/ PRF AND BONE GRAFT



PA 4 months after ext #3 w/ bone graft

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6. Wax-up done by the student

20 hours total

Pt approved aesthetics and changes

7. Started removing existing crowns, 10- 11/2022

4 appt (15 hours)- to remove existing crowns and take conventional impression from the 1st attempt for new provisional crowns

1 appt (3 hours) - to adjust and cement smile design provisionals

1 bite adjustment was made after cementation with MINO polishing point

8. Teeth whitening, Final impression 11-12/2022, CBCT upper arch

Lower bleaching tray was delivered for teeth whitening (1 month before shade selection) 11/2022

Conventional final impression was taken with 1 attempt 12/2022

CBCT upper arch 01/2023

9. Cementation PFZ crowns #4-13, prep #21 &28, 02-03/2023

CIMOE with RelyX UniCem 2 Shade A2

1 appt (#4-12)

2nd appt next day #13 w/ no anesthesia + bite adjustment

Prep #21 and #28 FZC s

Cementation #21 and #28 FZCs

10. Lower occlusal guard delivery 05/2023

Chose a lower occlusal guard for esthetic as well as to protect natural teeth from occlusal wear and PFZ crowns from fractures

CHRONOLOGICAL TIMELINE OF THE TX RENDERED

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BEFORE AND AFTER WAX-UP SMILE DESIGN

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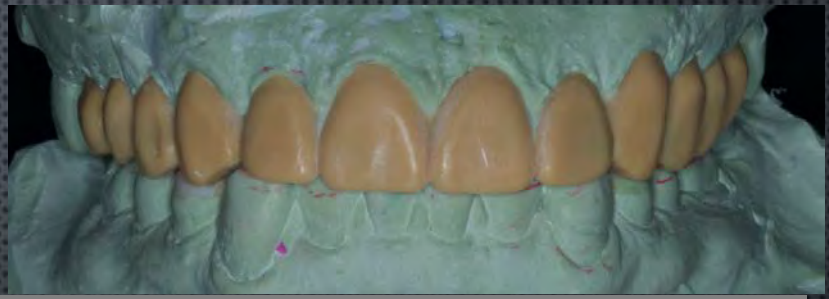
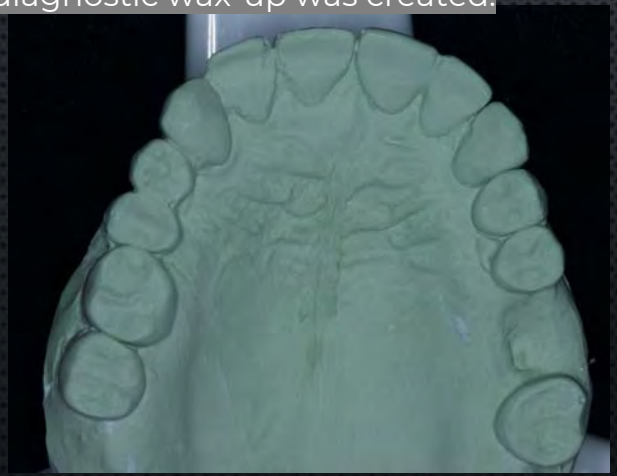
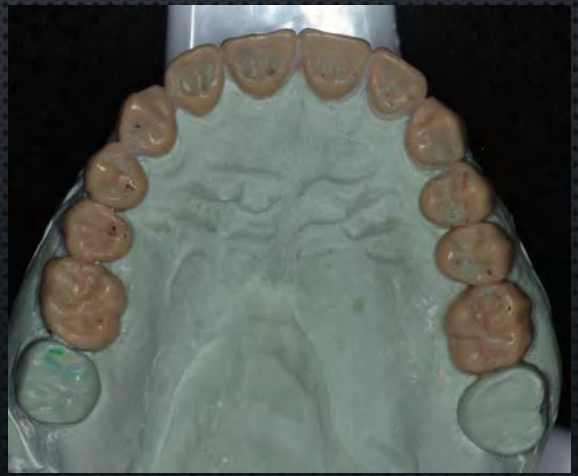


A diagnostic wax-up was prepared on the casts mounted on an average-value articulator Stratos 100. After the occlusal vertical dimension was elevated by 1mm with respect to the incisal guide pin of the articulator, a diagnostic wax-up was created.

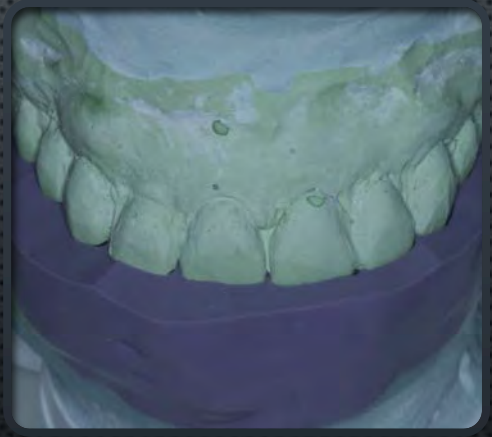


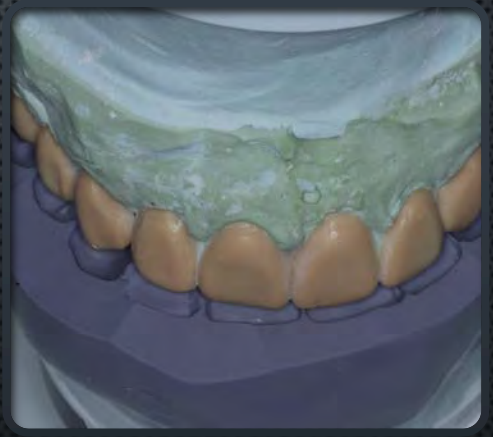
- THE SMILE DESIGN WAX-UP WAS DONE BY THE STUDENT DENTIST WITH APPROPRIATE OCCLUSION.
- TOTAL TIME 20 – 25 HOURS.



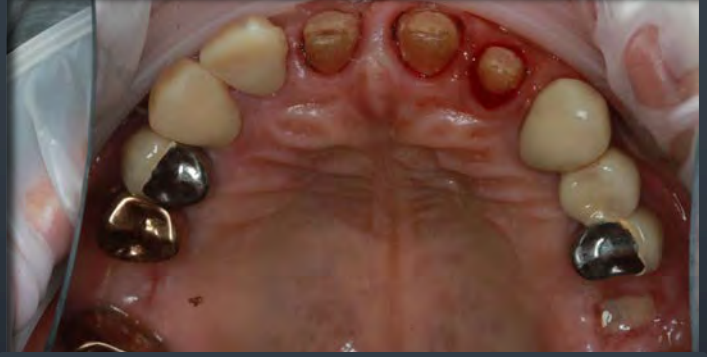
How the diagnostic wax-up was created

- Central and lateral incisors were positioned lingually 1.5 mm
- Right canine positioned lingually 2mm
- Left canine positioned lingually 1.5 mm
- Right side upper premolars lingually positioned 1 mm
- VDO was increased 1 mm

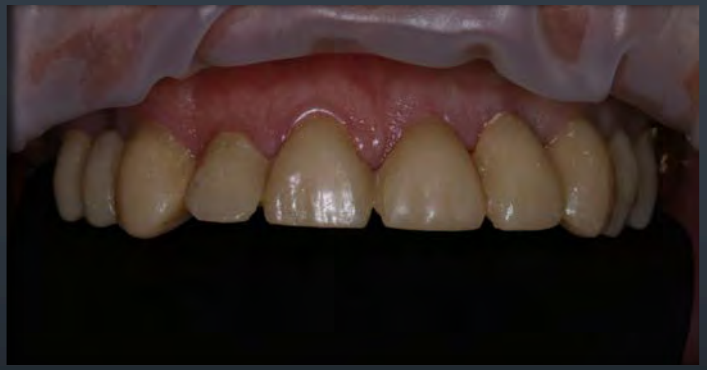




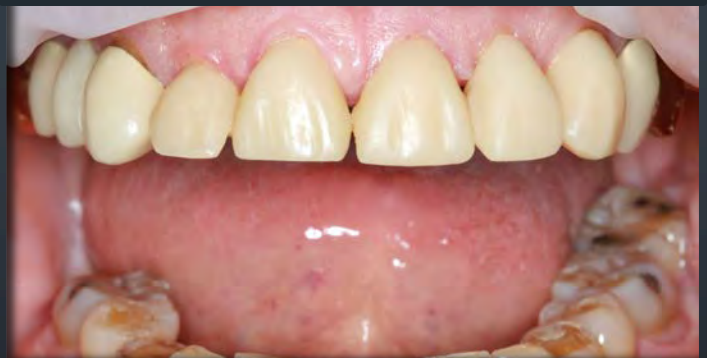
REMOVAL OF EXISTING CROWNS



What we found underneath existing crowns - enough tooth structure, overtapered preparations



1st set of provisionals was made from existing crowns with improved gingival contour



1 week post-op - gingival contour has improved, after gingivoplasty on #7 to even up gum line

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CBCT OF THE UPPER ARCH 4 MONTHS AFTER #3 EXT & BONE GRAFT

- SOFT TISSUE GROWTH WAS IDENTIFIED IN THE UPPER RIGHT SINUS
- THE PATIENT WAS REFERRED TO HIS MD FOR A FOLLOW-UP AND THE LESION HAS BEEN MONITORED - THIS DID NOT AFFECT THE PLANNED TX
- CBCT WAS TAKEN WHEN EXISTING CROWNS WERE REMOVED TO REDUCE THE SCATTERING EFFECT OF METAL
- BOTH SIDES HAD LARGE VESSELS IN THE LATERAL WALLS OF THE MAX SINUS WHICH HAD A POTENTIALLY HIGH RISK OF BLEEDING
- UR HAD 8 MM OF BONE HEIGHT AND ENOUGH WIDTH → VERTICAL SINUS LIFT WITH BONE GRAFT AND IMMEDIATE IMPLANT PLACEMENT
- UL HAD 3 MM OF BONE HEIGHT AND ENOUGH WIDTH → VERTICAL SINUS LIFT WITH BONE GRAFT → HEAL FOR 6 MONTHS→ IMPLANT PLACEMENT

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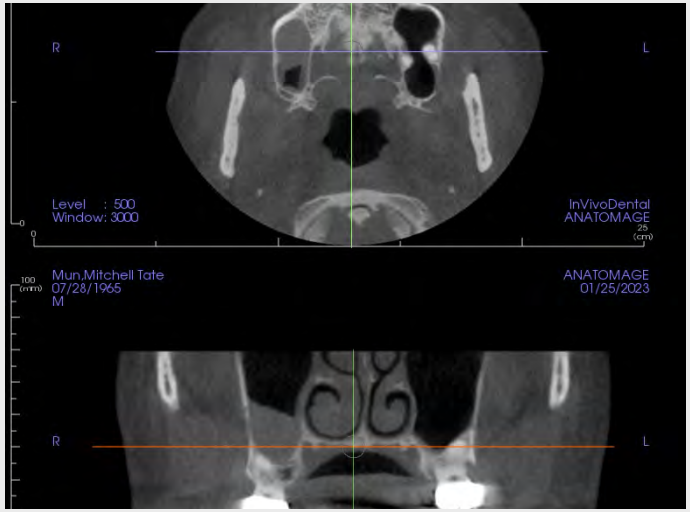
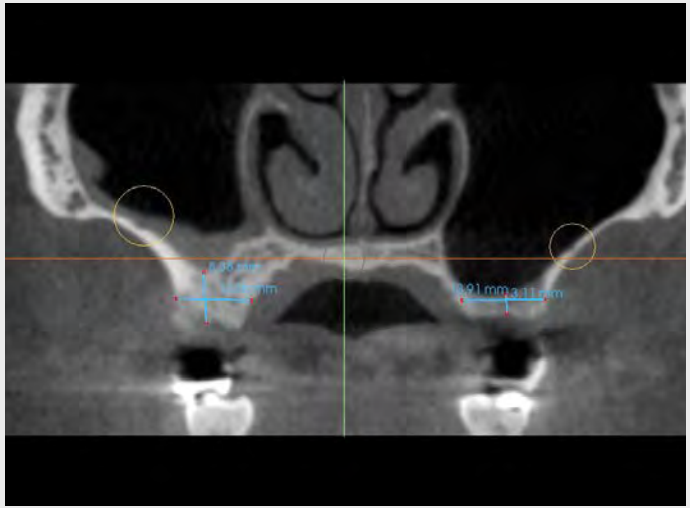
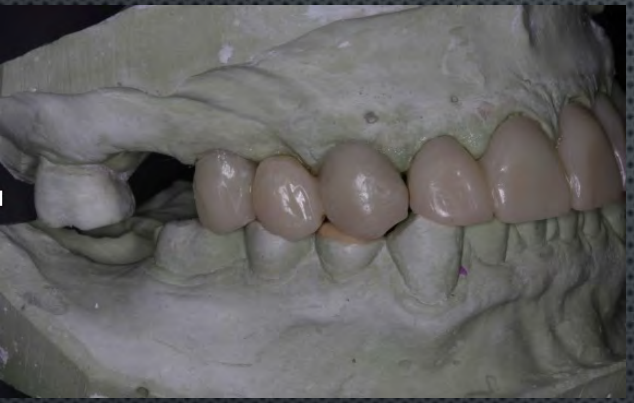
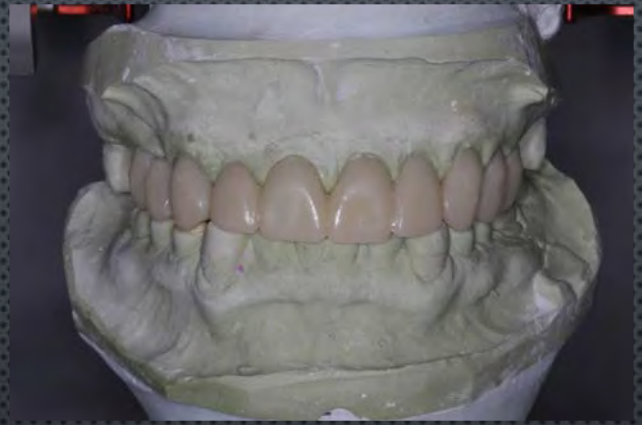
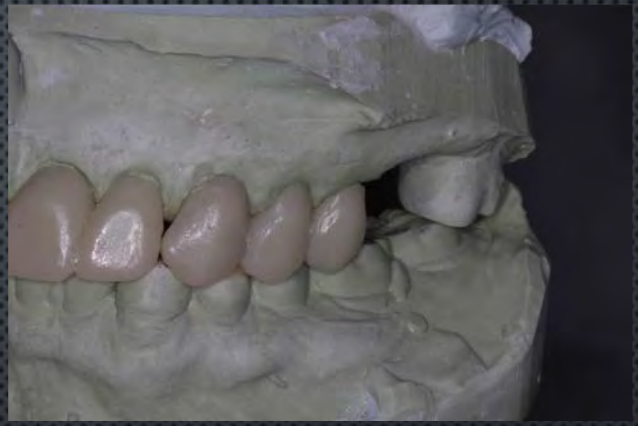




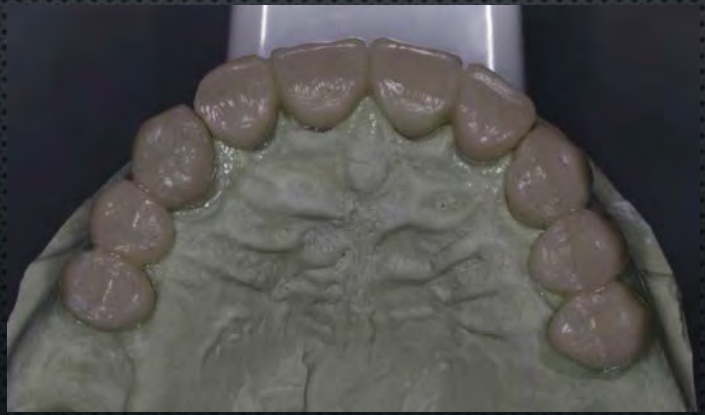
SMILE DESIGN PROVISIONAL FABRICATION







Interim crown restorations were fabricated **by the student dentist** with Integrity A3.5 on the stone **models** by duplicating the diagnostic wax-up **outside the chair time.**



Total fabrication time **of 3 hours** with the bite adjustment on the models.

The interim restorations were made to imitate the teeth shapes and smile line of the simulated outcomes and see how the patient adapts to the changes in VDO.

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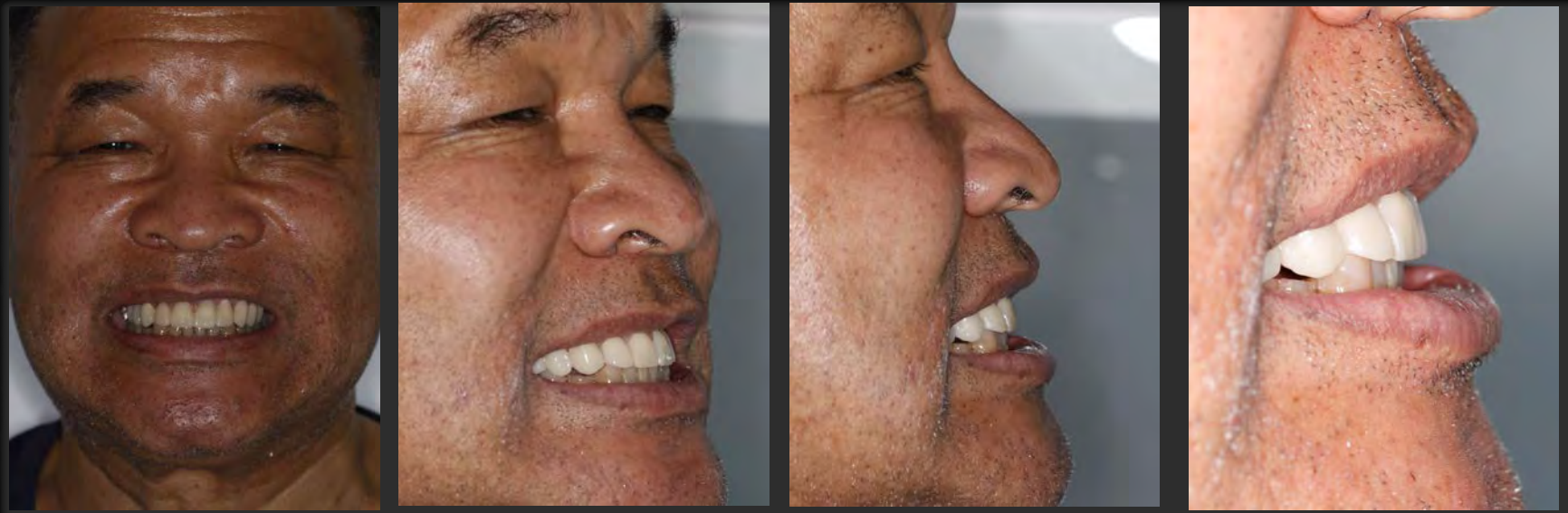

SMILE DESIGN PROVISIONALS WITH INCREASED VDO 1MM 1 WEEK AFTER THE CEMENTATION

During the 2.5-month follow-up, the patient appeared to have adapted well to the increased occlusal vertical dimension without any complaints of muscle or joint pain.

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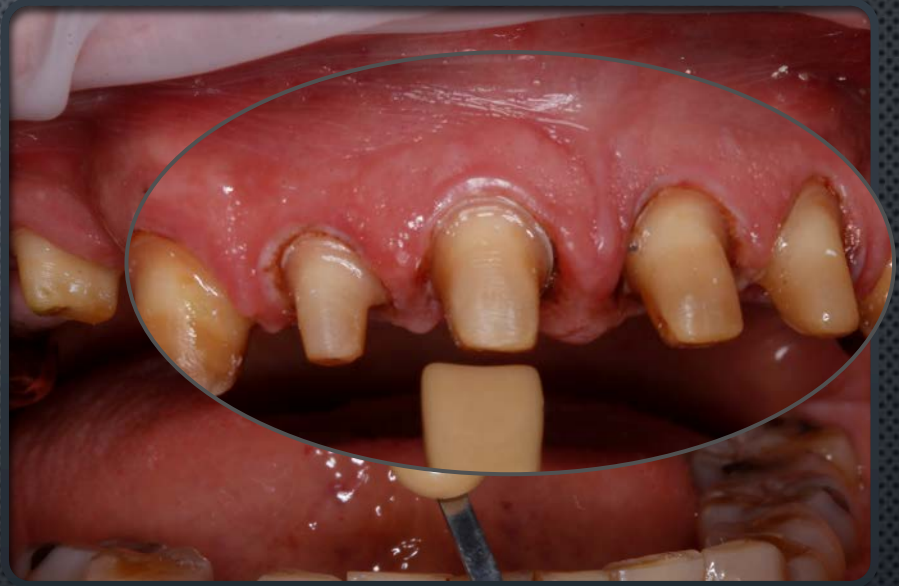
GINGIVAL TISSUE AFTER 2 MONTHS OF WEARING SMILE DESIGN INTERIM RESTORATIONS



OUTCOMES:

- REDUCED TISSUE INFLAMMATION AND BLEEDING
- **THE BITE WAS ADJUSTED 1 TIME WITH** A MINO RUBBER POINT ON #12 AND #13
- CONFIRMED BY A PATIENT COMFORTABLE VDO AND ESTHETICS
- **NO RE-CEMENTATION OR BREAKAGE OF THE PROVISIONAL** RESTORATIONS **DURING 2.5 MONTHS OF WEAR**
- CONVENTIONAL IMPRESSION WAS TAKEN FROM **THE 1ST ATTEMPT** BY USING 2 CORDS TECHNIQUE, A LARGE STOCK TRAY, AND HEAVY AND LIGHT BODY

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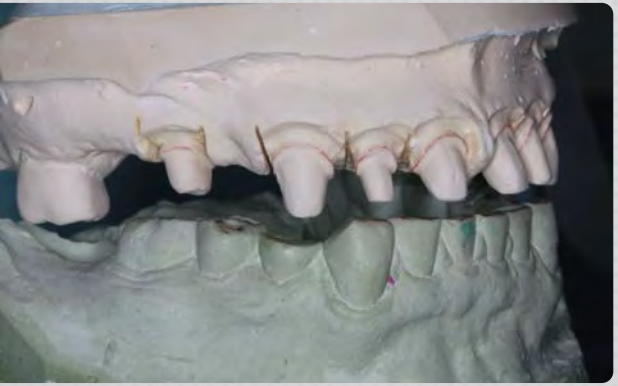

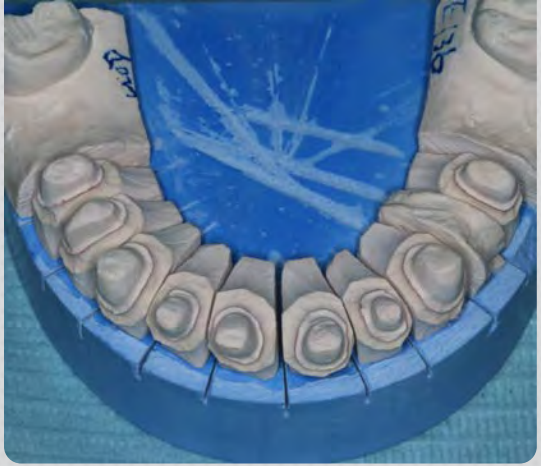

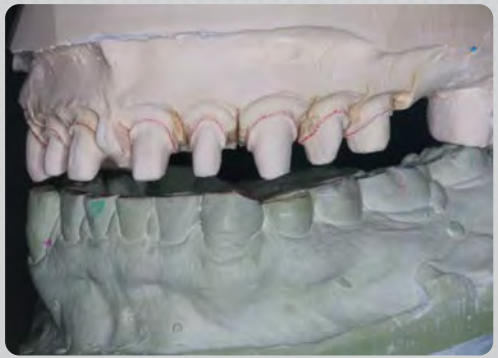

To maintain VDO established with provisionals, I took 2 bite records separately:

- One for posterior teeth with anterior provisionals on
- Second, with posterior provisionals on for anterior teeth
- Then mounted the upper master cast with the bite record

Friday night after clinic Dr. Curtis helped me to verify the fitting of permanent restorations and occlusion

MOUNTED UPPER MASTER CAST

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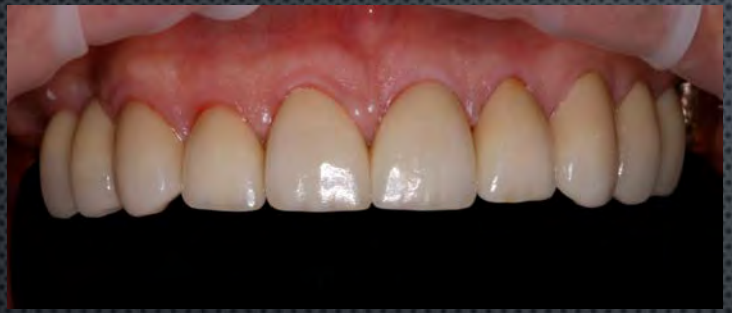
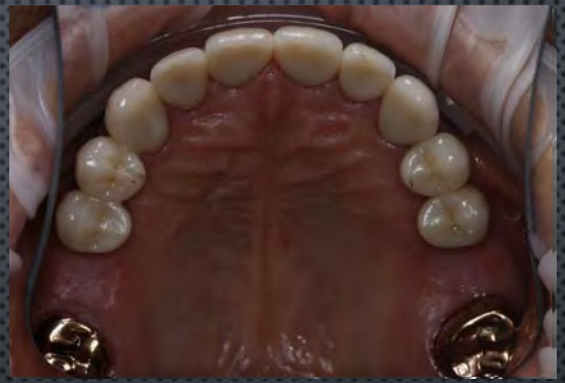
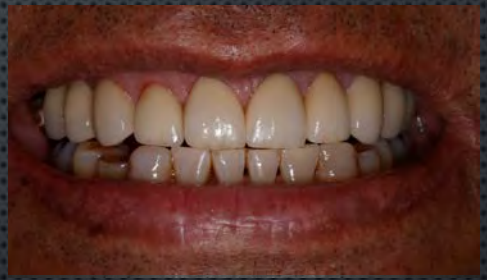
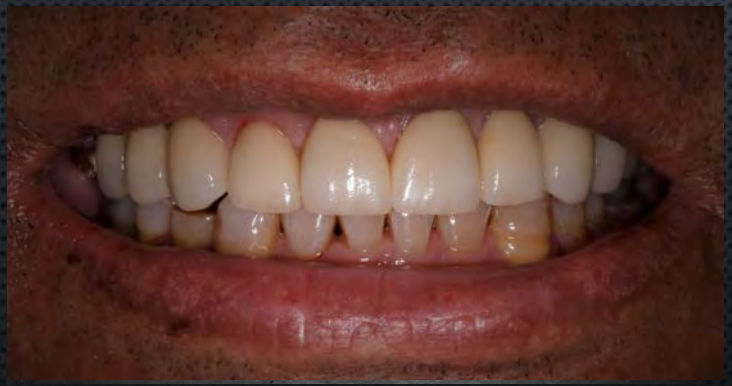
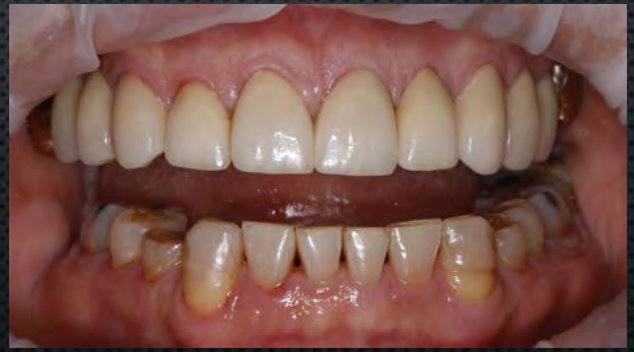
1 WEEK AFTER UPPER CROWNS CEMENTATION











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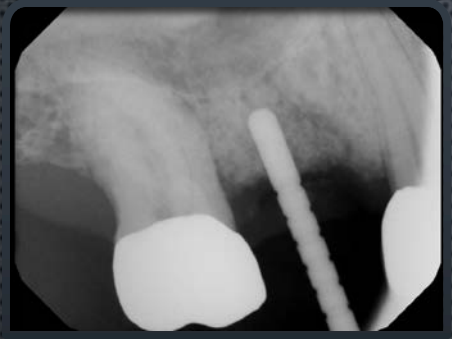

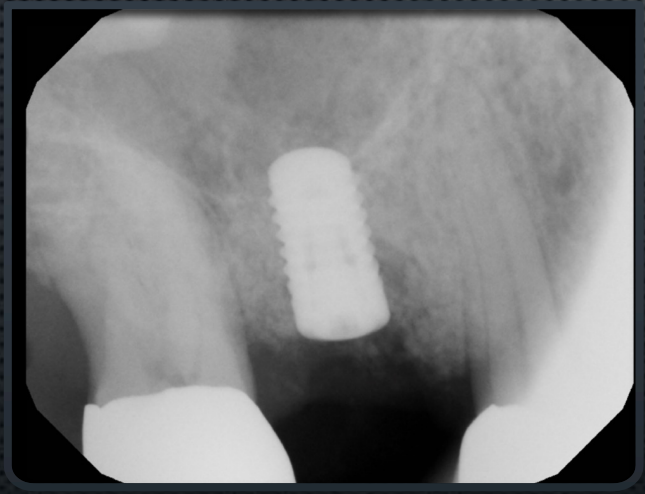

UR VERTICAL SINUS LIFT WITH BONE GRAFT AND IMMEDIATE IMPLANT PLACEMENT

- MAXILLARY SINUS MEMBRANE WAS ACCESSED THROUGH OSTEOTOMY BY USING SEQUENTIAL SINUS LIFT BURS W/VERIFIED ANGULATION WITH A VACUUM-FORMED SURGICAL GUIDE
- MEMBRANE WAS LIFTED WITH HYDRO SINUS LIFT SYSTEM AND 2-3 MM OF ALLOGRAFT WAS PLACED
- STRAUMANN 4.8X 8 MM IMPLANT WAS PLACED AND COVERED WITH THE TISSUE BY USING 3-0 GUT X2 INTERRUPTED SUTURES

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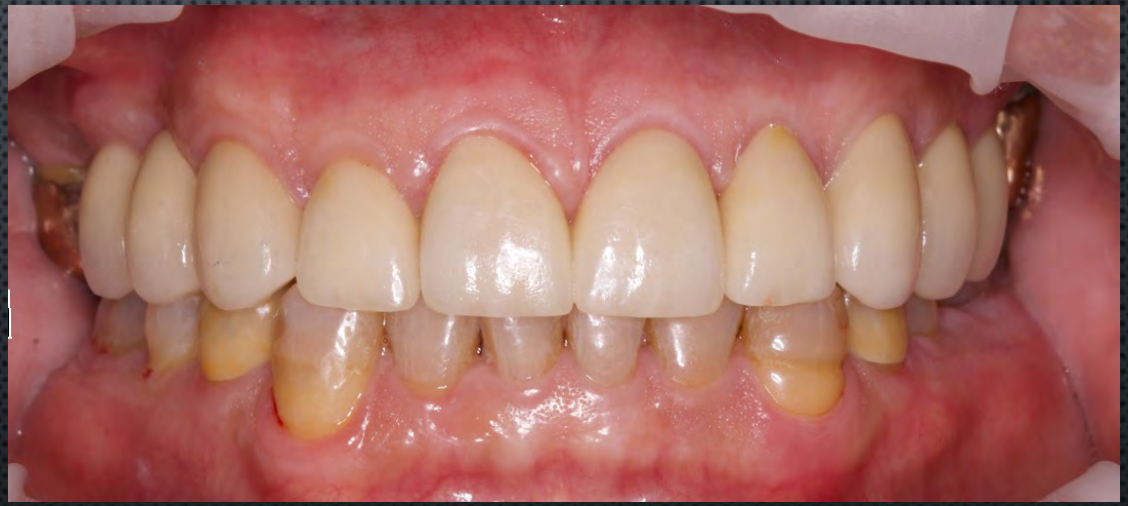
CEMENTATION #21AND#28 FZC

- There was no need for an occlusal reduction
- Conservative margin preparation keeping above the gingiva
- Patient wished to have lower crowns matched to lower natural dentition
- Notice gingival condition of upper teeth 1.5 months after cementation upper crowns



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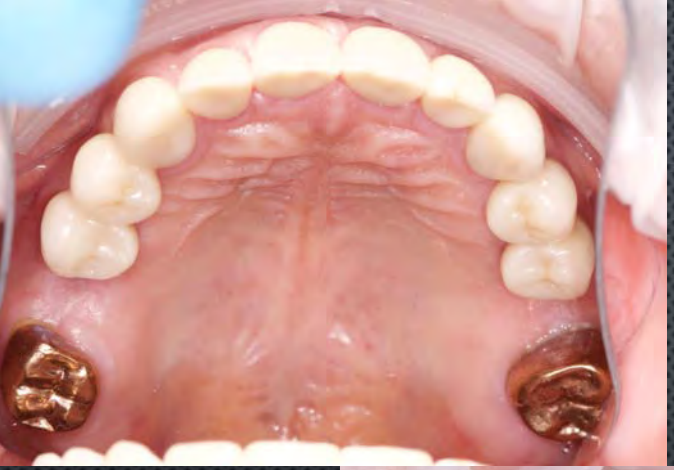
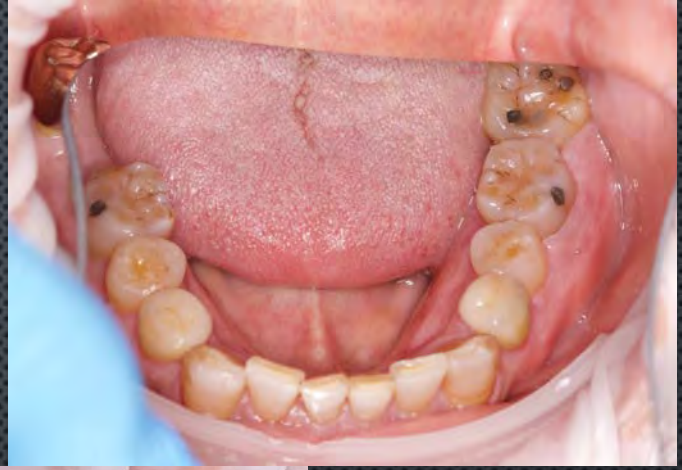
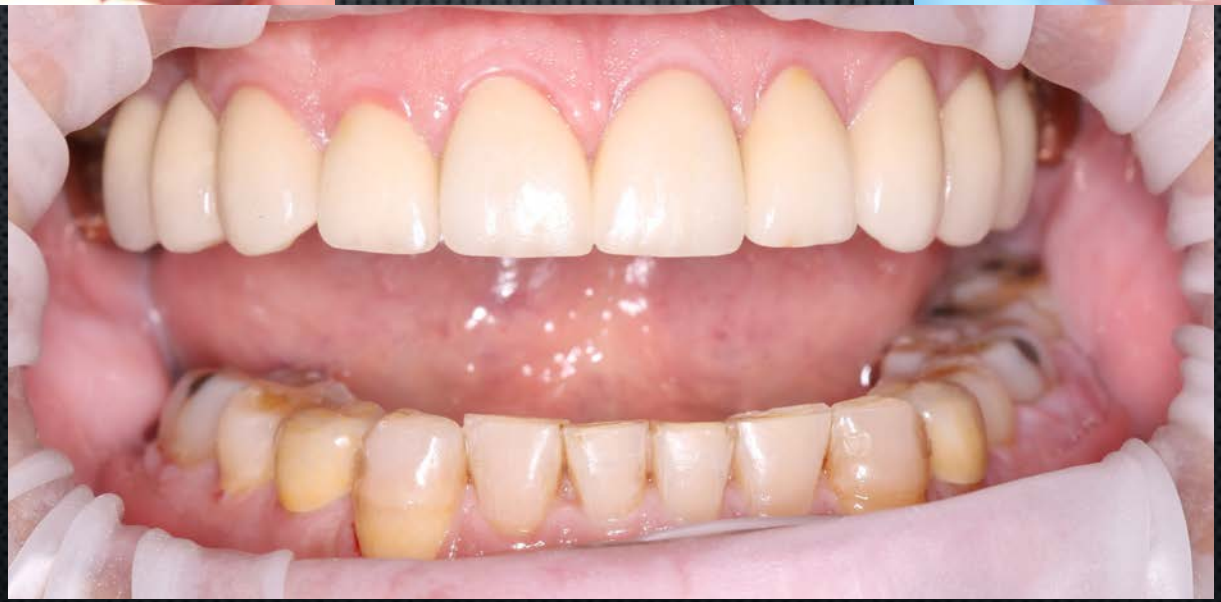


INTRAORAL PHOTOS WITH NEW INDIRECT RESTORATIONS





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CHRONOLOGICAL TIMELINE OF THE TX RENDERED

11. LL periodontal osseous surgery 4/2023

#18 and #19 cementum was smoothed with carbide burs

Granulation tissue was cleaned around both teeth including furcation of #19

Xenograft was placed around #19

12. UL vertical sinus lift with implant placement 4/25/2023

- Vertical sinus lift with allograft was completed
- Straumann 4.8 x 10 mm BL tapered implant was placed
- Pt will heal for 8 months before restoring
- The oral surgeon recommended to keep #15 as long as possible in order to retain proprioception on UL side

13. Osseointegration check #3 with restoration of #3 + SPT

In June with Garrett DDS'24

14. Osseointegration check and Restoration of #14 implant in 12/2023

- with Garrett DDS'24

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PERIODONTAL OSSEOUS SURGERY WITH BONE GRAFT #19

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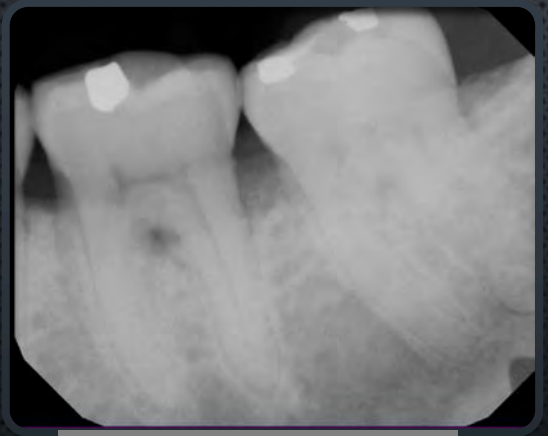
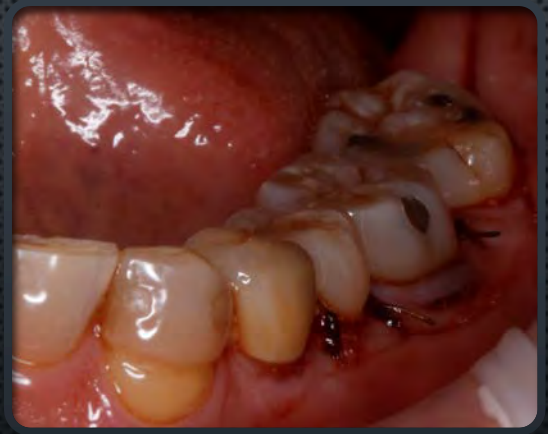
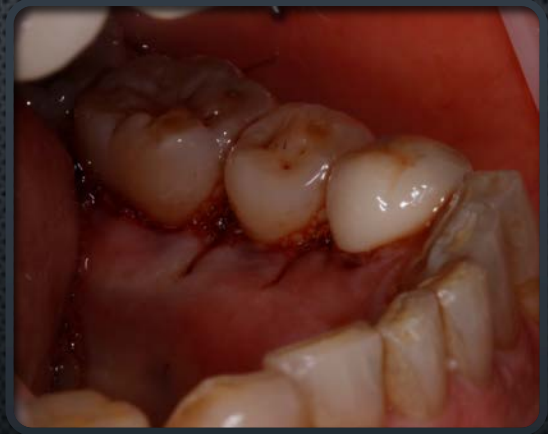
- Reflected MPFTF from Distal of #18 to Mesial of #21
- Smoothed cementum around #18 and #19
- Removed granulation tissue, xenograft was placed on lingual and buccal aspects of #19, sutured with 3-0 GUT interrupted sutures



PA #19 before surgery





UL VERTICAL SINUS LIFT WITH BONE GRAFT W/ IMMEDIATE IMPLANT PLACEMENT4/25/23

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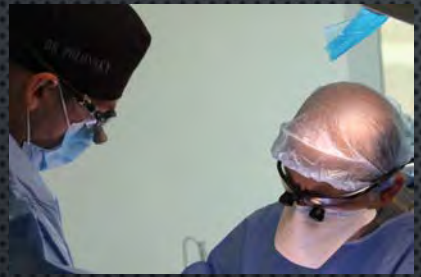
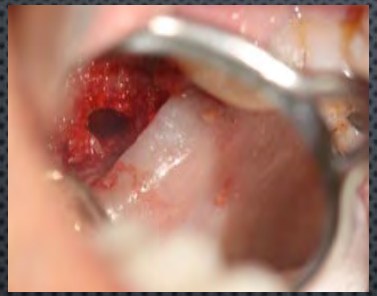
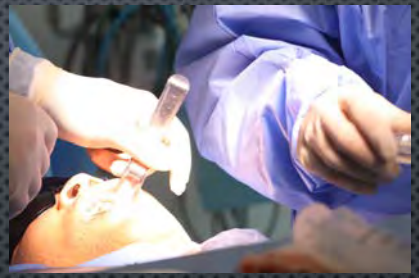
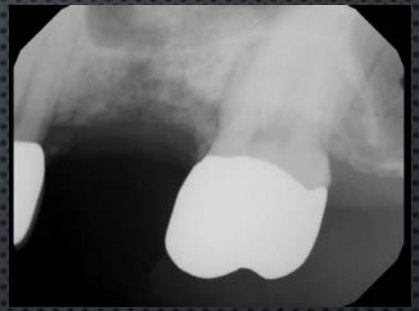
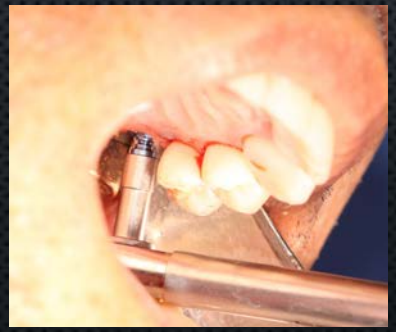
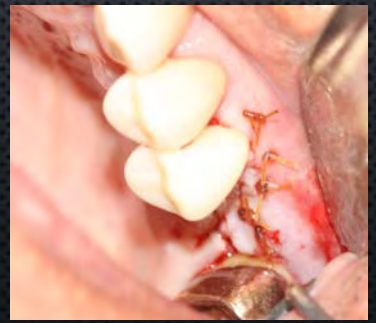
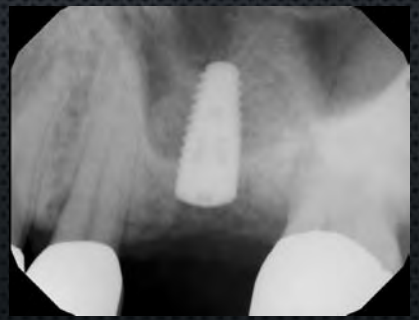





Vertical sinus lift was done by utilizing hydraulic pressure w/ immediate implant placement (BL Straumann 4.8x10 mm)



LOWER OCCLUSAL GUARD (DELIVERING 05/03/2023)

GOALS:

- TO PREVENT SUPRAERUPTION OF #2 AND TIPPING AND SHIFTING #2 AND #15 WHILE WAITING ON IMPLANTS HEALING
- TO PROTECT RESTORATIONS AND THE TEETH
- PREVENT DETERIORATION CAUSED BY GRINDING AND CLENCHING

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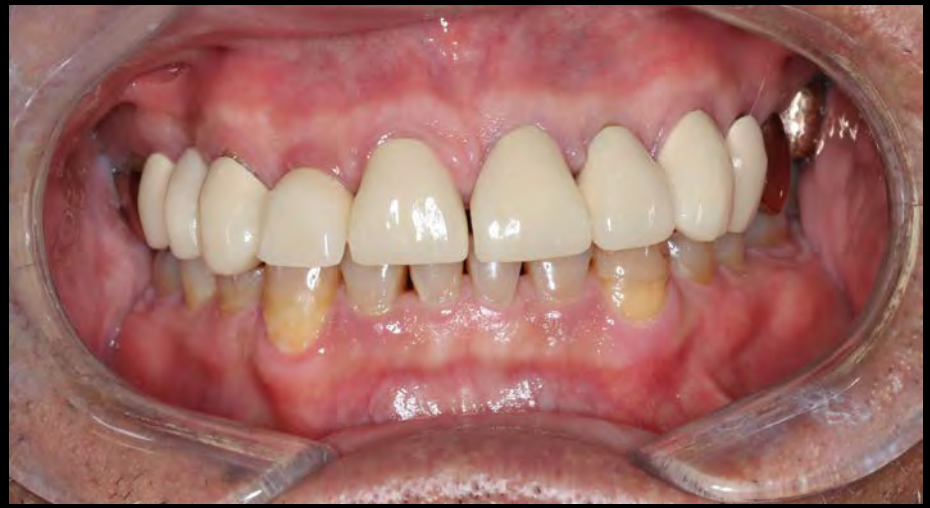
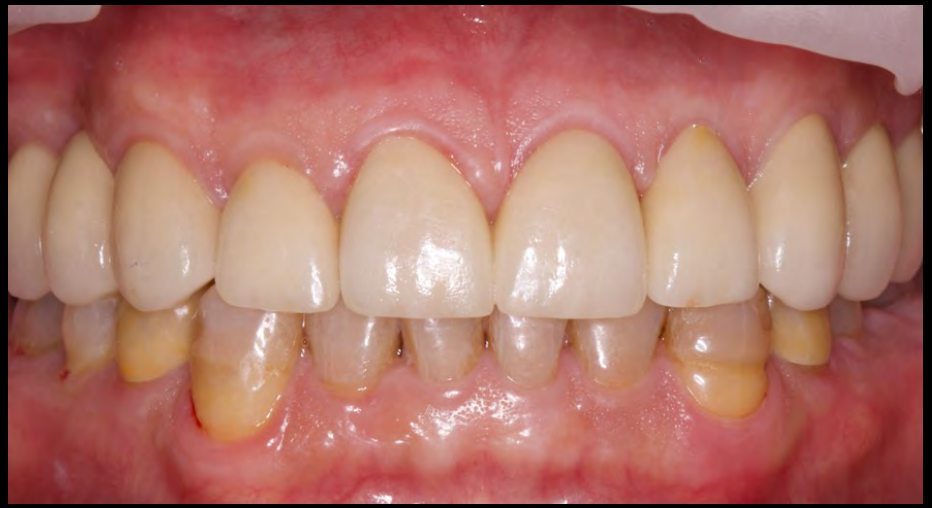
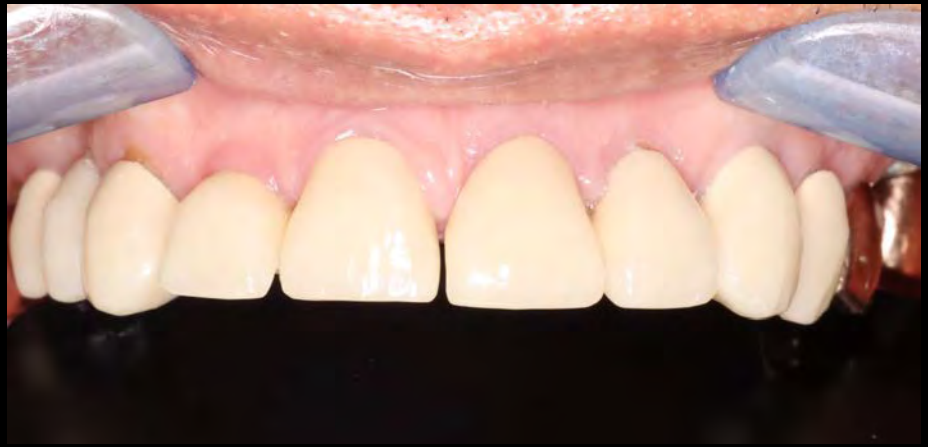
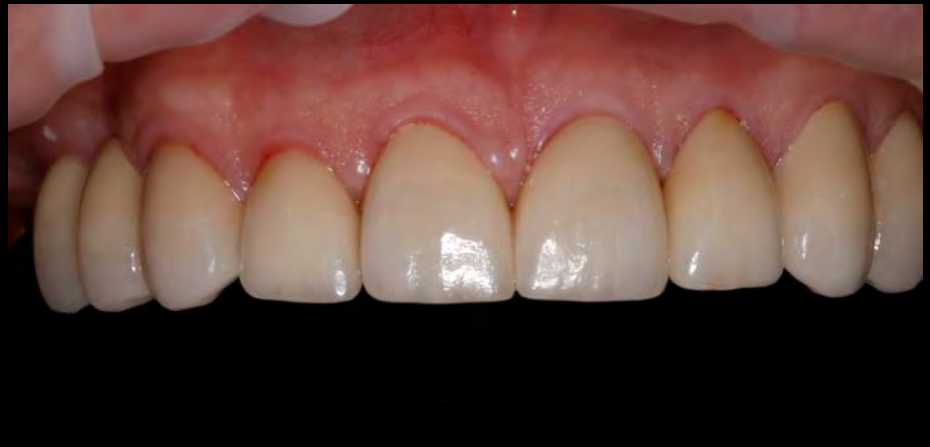
Before…

After…



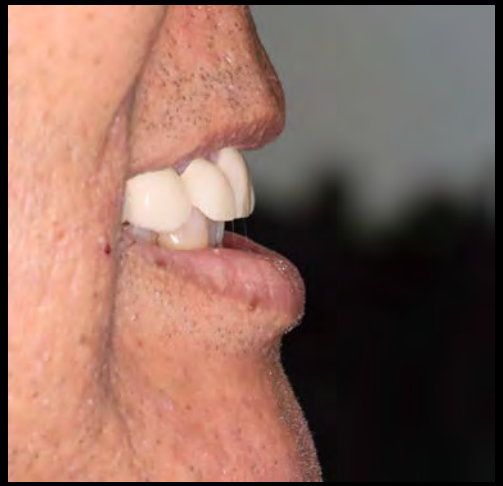




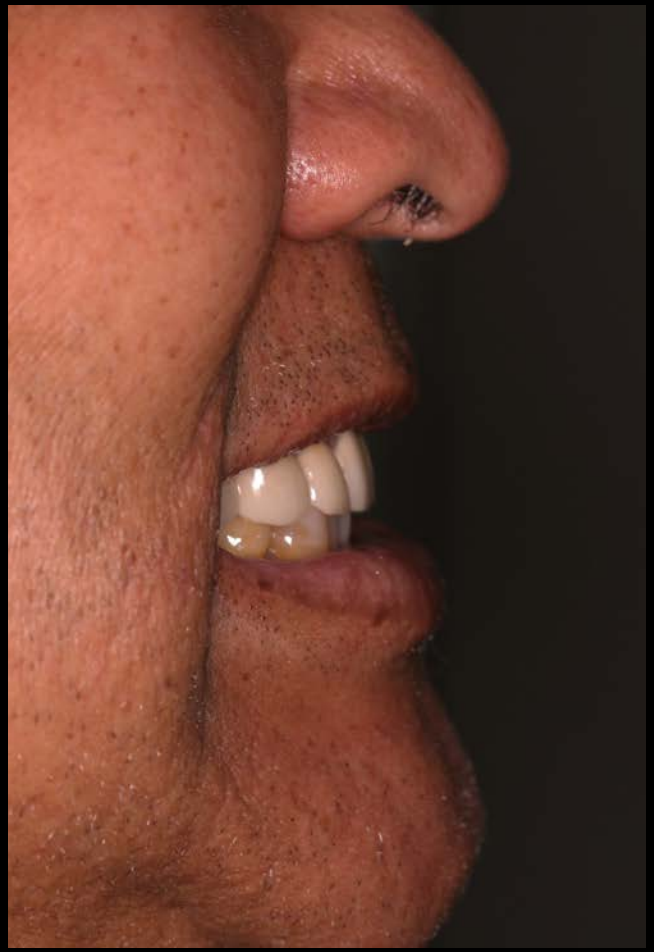


Before…

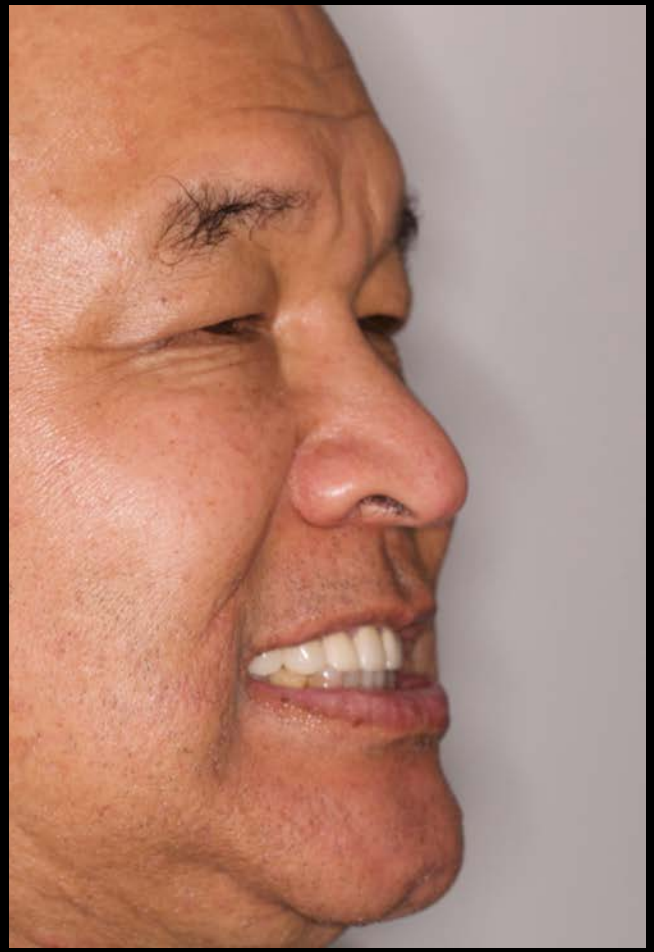
After…



Before…



After…




thank
you

"HEAD, HEART AND HANDS"

- The patient was reluctant to the fact that he has diabetes type II. Even though he was diagnosed with it and prescribed Metformin he still thought he is in the pre-diabetic stage. We had a few conversations with him regarding the importance of admitting it and understanding the consequences of not being compliant with the treatment. We discussed the importance of living a healthy lifestyle by improving his diet and adding physical exercises;
- Prior to committing to the comprehensive extensive treatment, the patient had a second opinion where he was offered to extract all his teeth and get implant overdentures. After losing #15 due to periodontal disease progression the patient started looking into options to save his remaining teeth;
- Per patient, he has never had a "good beautiful smile" and when he had his upper teeth crowned 5 years ago, he wished for an improvement in esthetics.

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"HEAD, HEART AND HANDS"

- Since the patient had to pay out of pocket and had a limited budget, I offered to do a diagnostic smile-design wax-up and interim provisionals by myself in order to go with the most ideal treatment plan for him.
- Throughout the dental treatment period, we have noticed a change in the patient's attitude toward his dental and overall health. Mitchell started regularly exercising and lost some weight. His oral hygiene has improved significantly as well as his health literature. We went from the patient's attitude being "do whatever you think is best" to interested and fully involved in every decision-making and every procedure, fully understanding the RBAs of every procedure, and being able to make the best treatment decision for him.
- Mitchell also showed more trust in dental professionals. We started Tx with him saying "Just don't mess up" and continued with him fully trusting and understanding the process.

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SPECIAL THANKS:

- **To Dr. Aziz** for helping with diagnosing, treatment planning, and executing the treatment in the main clinic from the esthetic aspect
- **To Dr. Curtis** for helping with planning the wax-up, making provisionals, maintaining the VDO, making sure the cementation would go smoothly prior to the appointment, and helping execute the treatment from the functional aspect
- **To Carlos Correa** for providing educational videos on how to do a full-mouth wax-up into occlusion and supervising the whole process: wax-up, making provisionals, shade selection and matching, and final crowns delivery
- **To Dr. Boghossian and Dr. Polonsky** for helping with planning and executing sinus lifts and implant placements
- **To Dr. Grill** for help in improving periodontal health, which is fundamental for the whole Tx plan.
- **To all the above, Dr. Andrews** and **Dr. Ward** for supporting and pushing me forward.

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WHY MONOLITHIC ZIRCONIA CROWNS FOR #21, 28, 3, 14

- These teeth are not in the esthetic smile zone
- Mechanical properties of Monolithic zirconia restorative material are superior to all-ceramic with minimal risk of fracture. [2]
- The degree of antagonistic tooth wear is less in zirconia than in feldspathic dental porcelain, representing that the zirconia may be more beneficial in terms of antagonistic tooth wear. [1]
- In the study done by Tang, et al. The 96-week follow-up period showed that monolithic zirconia crowns showed good biocompatibility, and minimal antagonist natural tooth wear, with a success rate for posterior restorations. [2]
- #21 and #28 have buccal functional cusps that are at a higher risk of fracture in case of layering porcelain in that area.
- #3 and #14 will bare the chewing load and will encounter heavier forces

1. Jung YS, Lee JW, Choi YJ, Ahn JS, Shin SW, Huh JB. **A study on the in-vitro wear of the natural tooth structure by opposing zirconia or dental porcelain**. J Adv Prosthodont. 2010 Sep;2(3):111-115. https://doi.org/10.4047/jap.2010.2.3.111
2. Tang Z, Zhao X, Wang H, Liu B. Clinical evaluation of monolithic zirconia crowns for posterior teeth restorations. Medicine (Baltimore). 2019 Oct;98(40):e17385. doi: 10.1097/MD.0000000000017385. PMID: 31577743; PMCID: PMC6783234

WHY PORCELAIN-VENEERED ZIRCONIA CROWNS FOR #4-13 WERE SELECTED

- Considering parafunctional habits and wear of opposing natural dentition PFZ restorative material was chosen over Lithium disilicate. According to literature reviews monolithic zirconia ceramics cause minimal wear of antagonists when appropriately polished. [1][2][4] Glassy materials are both more susceptible to wear and more abrasive to the antagonist relative to zirconia.
- Translucent zirconia had translucency similar to that of lithium disilicate; however, as translucency increased with increased cubic content, edge toughness decreased.[1]
- In a study done by, Rodrigues at al. it was found that extended glaze improves the resistance to crack initiation and propagation of PVZ. Glaze and extended glaze do not lead to perceptible changes in color and translucency. [3]
- The 10-year survival rate of PFZ crowns and 10-year chipping-free rate were 95.0% (CI 86.0-100%) and 78.8% (CI 62.2-99.7%), respectively. It was confirmed with high patient satisfaction. [6]
- No study exists, either in vitro or clinical, to evaluate the wear properties of new ultra-translucent zirconia ceramics. However, it is shown high esthetics and strength with less chipping and fracture risk. High translucent monolithic zirconia is an excellent future alternative to LD and PFZ restorative materials. [3]

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JUSTIFICATION FOR INCREASING VDO BY 1 MM

- Reasoning: to gain space for restorative material (prosthetic convenience) and to improve esthetics without increasing functional risk.
- An increase in OVD should be determined on the basis of a need to accomplish satisfactory and esthetically pleasing restorations. The factors that should be considered as determinants for increasing the OVD are the remaining tooth structure, the space available for the restoration, occlusal variables, and esthetics. [1]
- An interocclusal rest space of 2 mm has been suggested as the physiological space, and therefore an IORS of more than 2 mm indicates that the OVD can be safely increased minimally for prosthodontic convenience (max 4 mm with loss of VDO). [1]
- To be predictable and provide a low-risk outcome, the alteration of the OVD should be the minimum necessary to harmonize dentofacial esthetics, provide space for the planned restorations, and improve the occlusal relationships. Subjective parameters such as facial harmony, speech resonance, and comfort must also be addressed and approved by the patient.[2]
- All the alterations to the OVD should be tested in a reversible and definitive manner such as through adhesive mock-ups or provisional.[2]

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OKU SUTRO EXCELLENCE DAY PROJECT COVER SHEET

PROJECT TITLE: MULTIDISCIPLINARY ORAL REHABILITATION WITH ALTERED VDO

Award Category:	Restorative (Direct/Indirect)
List names of all contributors to this project:	Student Name: Anya Boinik #98936389 Program: DDS. Class Year 2023
Enter your abstract text here (300 words max) :	Multidisciplinary Oral Rehabilitation with Altered VDO Clinical Case that included disciplines Periodontics, Oral Surgery, Implantology, Direct and Indirect restorations with increasing VDO by 1 mm, and improving esthetics.