

## 基隆長庚聯合病例討論會

上顎前牙最少六個單位牙冠牙橋

All-ceramic 6-units anterior fixed partial bridge using a CAD-CAM produced Y-TZP zirconia: a clinical report

基隆長庚醫院

報告者：翁凱威 醫師

**Key words:**

zirconia, fixed dental  
protheses, long-span,  
connector size, fracture  
resistance

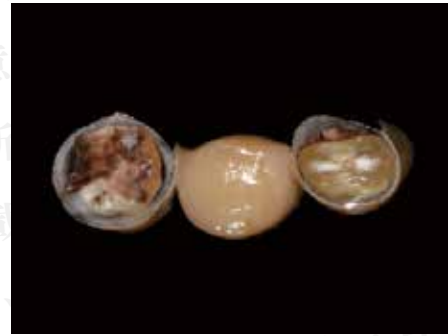
## General Data



- Name: 林 O 和
- Gender: male
- Age: 61
- Attitude toward dental treatment: positive but with claustrophobia
- First visit: 2021/06/02

## Chief Complain

- Bridge dislodged over #11x22



## Past Medical History

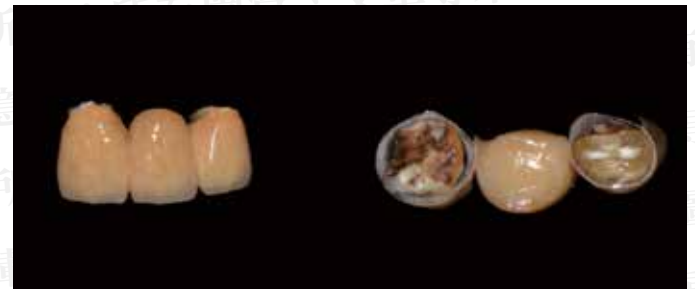
- HTN, DM, aspirin taking \*\*\*\*\*
- 幽閉恐慌症
- 白斑，口腔黏膜纖維化
- 反覆口角炎，風濕免疫科檢查無異狀，皮膚科診斷：local infection unspecified
- No known food or drug allergy

## Personal Habits

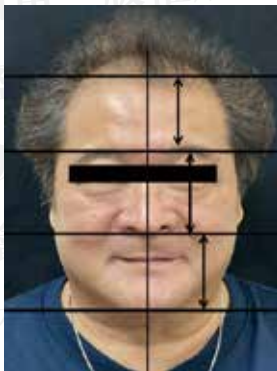
- Alcohol drinking (quit)
- Betel nut chewing (quit, 口腔黏膜纖維化，嘴巴張不太開)
- 嚴重口角炎
- Cigarette smoking (quit)
- Bruxism or parafunction (-)
- Food preference(-)

## Past Dental History

- OD (+)
- Endodontic treatment (-)
- Periodontal treatment (-)
- Extraction (+)
- Prosthetic treatment:
  - #11x22 FDP fabrication several years ago



## Extra-oral Examination



- Lip incompetence (-)
- Mentalis m. strain (-)
- Muscle tone: tense



- Low smile line
- Facial asymmetry (-)
- Profile: straight
- Nasolabial angle: 120



- Lip to E-line:
  - Upper: retruded
  - Lower: retruded

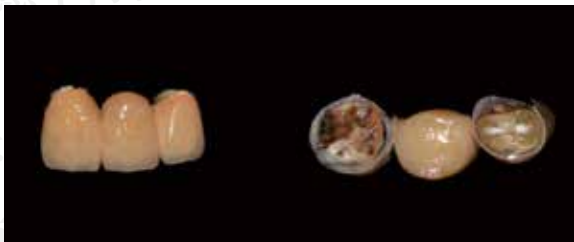
## TMJ-related Examination

- TMJ pain: nil
- Joint sound: nil
- Jaw deviation: nil
- Maximum mouth opening: 25 mm  
(Reference tooth: 23, 33)
- Muscle tenderness: nil
- Bruxism: denied

### Present dentition

765 432x	-x34 56
654321	12345

### Fixed dental prostheses: #11X22 dislodged



	11	21	22
<b>B ferrule</b>	1 mm		1 mm
<b>P ferrule</b>	1 mm		1 mm

### Intraoral photo after tentative Tx of #11 #22 r.r. extraction

### Present dentition

65 432x	-x34 56
654321	12345



### Arch form

Upper: ovoid  
Lower: ovoid



### Generalized attrition



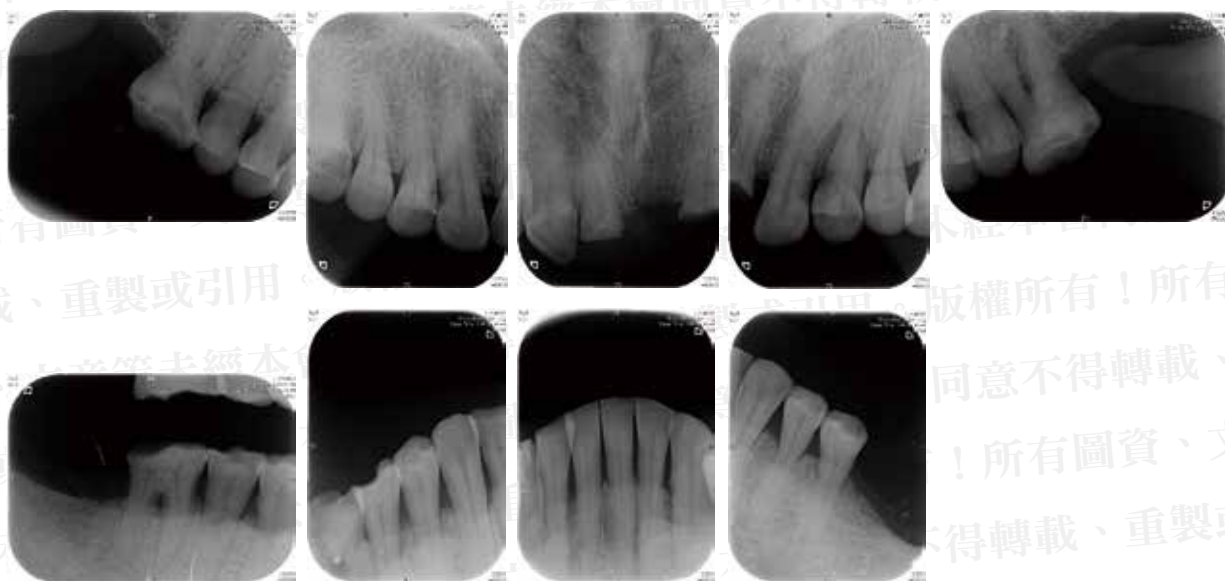
### elongation: #26



### Supraeruption of lower anterior teeth

## Radiograph Examination

2021.11.16

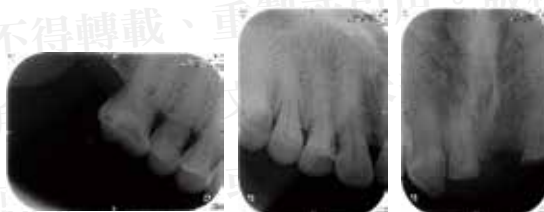


- #11 22 : residual roots
- # 17 18 21, 27, 28,36-38 , 47 48 missing
- #26 elongation
- Retained root : #11 22

## Periodontal Examination

2021.11.16

### Upper Right Area



Distal		Buccal												Mesial				
Tooth	18	17	16	15	14	13	12	11										
A.L			4 6 4	3 5 4	2 2 2	2 2 1	2 2 1	1 1 1										
P.D.			3 3 3	3 4 4	3 2 3	3 3 3	3 3 3	1 1 1										
P.D.			3 2 3	3 3 4	4 3 3	4 3 3	4 3 3	1 1 1										
A.L.			4 5 4	3 3 3	4 3 3	1 1 1	1 1 1	1 1 1										
Mobility																		
F.I.																		
Distal		Palatal												Mesial				

### Upper Left Area



Mesial			Buccal															Distal						
Tooth	21			22			23			24			25			26			27			28		
A.L.				1	1	1	2	1	2	7	3	5	3	3	3	5	3	3						
P.D.				1	1	1	3	2	3	8	2	6	3	3	3	5	3	5						
P.D.				1	1	1	2	2	2	9	2	6	4	2	3	5	4	5						
A.L.				1	1	1	1	2	2	7	2	5	3	2	3	5	4	5						
Mobility							Gr I.																	
F.I.																								

Mesial			Palatal															Distal		
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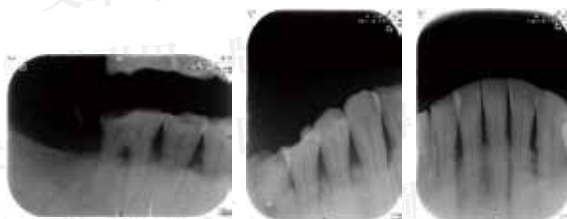
### Lower Left Area



Mesial			Lingual															Distal						
Tooth	31			32			33			34			35			36			37			38		
A.L.	2	2	2	2	2	3	2	2	3	3	2	3	3	2	3									
P.D.	2	2	2	2	2	3	2	2	3	3	2	3	3	2	3									
P.D.	3	2	2	2	2	3	3	2	3	3	2	2	3	2	3									
A.L.	3	2	2	2	3	3	3	2	3	3	3	2	3	3	3									
Mobility																								
F.I.													B-I, L-I											

Mesial			Buccal															Distal		
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### Lower Right Area



Distal			Lingual															Mesial						
Tooth	48			47			46			45			44			43			42			41		
A.L.							5	3	6	2	4	5	3	2	3	3	2	3	2	2	3	2	2	3
P.D.							5	3	6	2	2	3	3	2	3	3	2	3	2	2	3	2	2	3
P.D.							3	2	2	2	2	3	2	2	3	3	2	2	2	2	4	3	2	3
A.L.							4	4	3	4	5	4	2	3	3	3	2	2	2	2	4	3	2	3
Mobility																								
F.I.																								

Distal			Buccal															Mesial		
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## Occlusal Examination

- Midline:
  - Upper: Nil
  - Lower: shift to R't 2 mm
- Overjet: Nil
- (Reference tooth: 16, 46)

Angle's classification	Right	Left
Canine relationship	Class I	Class I
Molar relationship	Class II	Unknown



## Dentolabial Analysis



- Incisal curvature vs. lower lip line: Unknown
- commissural line: parallel
- Upper interincisal line vs. midline: Unknown
- Lower interincisal line vs. midline: shift to R't 2 mm
- Smile width (No. of teeth visible): Unknown
- Labial corridor: normal

## Tooth Analysis



- Gingival biotype: thick
- Papillae: present
- Tooth type: square
- Macro-texture: slight
- Micro-texture: no



- Gingival level: slightly asymmetric
- Zenith position: not ideal
- Tooth axis: slightly asymmetric
- Super-eruption of lower anterior teeth



	13	12	11	21	22	23
W (mm)	8.0	7.0				7.5
L (mm)	10.0	9.0				10.5
W/L	0.8	0.77				0.71
Average W/L	0.77	0.76				0.77

(Magne and Belser, Bonded porcelain restorations. Quintessence publishing Co, 2003, ch2.)

### Problem List

- Inadequate oral hygiene
- Molar class II, suspected UA class II division II
- Super-eruption of lower anterior teeth
- Betel nut chewing history ( quit, 口腔黏膜纖維化)
- 有幽閉恐慌症

### Diagnosis

- Localized periodontitis, stage III, grade A (2017 AAP classification)
- FM periodontitis with plaque and calculus deposition
- #17 18 ,21, 27, 28, 36-38 , 47 48 missing
- #11 #22 : residual roots, ferrule : 1-2mm
- #26 elongation
- Molar class II relationship
- FM attrition

### P't expectation

- 想要固定假牙
- 後牙缺牙區暫時不考慮處理，等前牙處理完再考慮植牙
- 想保留自己的自然牙，盡量不要修其他牙齒。

### Treatment goal

- Improve oral hygiene
- Treatment the periodontitis
- FM rehabilitation
- Improve esthetic problem

## Tx plan discussion

### Angular cheilitis



International Journal of Dentistry and Oral Science (IJDOS)  
ISSN: 2377-8075

#### Angular Cheilitis - An Updated Overview of the Etiology, Diagnosis, and Management

Research Article

Anitha Krishnan Pandarathodiyil<sup>1\*</sup>, Sukumaran Anil<sup>2</sup>, Srinivas Prasad Vijayan<sup>3</sup>

#### Abstract

Angular cheilitis (AC) is a common clinical entity which was described over a millennium ago. It is an inflammatory condition typified by erythema, moist maceration, ulceration, and crusting at the commissures of the mouth. The etiology of AC is quite diverse and notoriously difficult to pin down as it is construed to be a multifactorial disorder of infectious origin. Consequently, manifold local and systemic causes are implicated in the etiopathogenesis of AC. While considering local etiology; any factor that creates a chronic and moist environment for microbial growth at the oral commissures can be culpable in the etiology of AC such as habitual lip licking, thumb sucking or biting the corners of the mouth, reduced vertical height of the face, and sagging of tissues at the angles of the mouth, to name a few. Nutritional deficiencies namely iron, and members of

Int J Dentistry Oral Sci. 2021;8(2):1433-1438.

雖然病人的主訴只是要處理脫落的前牙假牙，但觀察到病人看過風濕免疫科以及皮膚科檢查，確認無系統性疾病的問題，仍然有反覆出現的口角炎。根據一篇 2021 年在 International Journal of Dentistry and Oral Science (IJDOS) 關於 Angular cheilitis 的 overview 文獻，任何為口腔連合處微生物生長創造長期潮濕環境的因素，都可能是導致 AC 的病因，其中一項為 reduced vertical height of the face，也就是 VD 高度的下降，所以在討論治療計畫時，若要順便幫病人改善口角炎的問題的話，VD 的提高的全口重建，可以納入其中一項治療計畫。跟病患說明把上排或下排牙齒每個都套牙套把咬合提高也許能一起改善口角炎的發生，但病患認為費用昂貴，以及擔心嘴巴更張不開的問題，不願意進行太過複雜的治療，因此後續的治療計畫會維持現有的 VD 去重建主訴前牙區域。

#### Patient's choice

VD 不變

### Treatment Plans Option-1

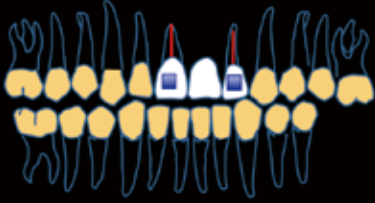
#### Crown lengthening

- #11 #22 endo treatment
- #11 #22 crown lengthening
- #11, #22 post
- #11-X-22 bridge

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• Short Tx time</li></ul>	<ul style="list-style-type: none"><li>• Unesthetic - gingival design and C/R ratio.</li><li>• Surgery for crown lengthening</li></ul>

## Treatment Plans Option-2

### UA Orthodontic extrusion with Bridge

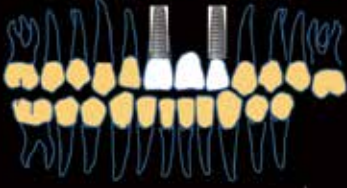


- #11 #22 endo treatment
- #11 #22 Orthodontics extrusion
- #11 #22 Crown lengthening/gingivectomy
- #11, #22 post and preparation
- #11-X-22 bridge

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Keep roots</li> <li>• UA more esthetic than CLP directly</li> </ul>	<ul style="list-style-type: none"> <li>• More expensive (UA Ortho)</li> <li>• Time consumption for UA Ortho Tx</li> <li>• Root resorption &amp; increasing C/R ratio</li> </ul>

## Treatment Plans Option-3

### Ridge preservation + Implant or Immediate implant

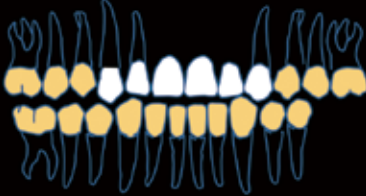


- #11 #22 EXT & ridge preservation or
- #11-X-22 bridge
- #11 #22 EXT & #11 21 immediate Implant
- #11-X-22 immediate restoration

Advantages	Disadvantages	Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Predictable high survival rate of dental implant</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive</li> <li>• Bone resorption after tooth EXT –esthetic issue</li> <li>• Multiple soft surgery required</li> <li>• Most time consumption due to ridge preservation and osteointegration</li> </ul>	<ul style="list-style-type: none"> <li>• Less Tx time required</li> <li>• More bone and soft tissue preserve due to immediate restoration</li> <li>• Less UA esthetics issue for implant if success</li> </ul>	<ul style="list-style-type: none"> <li>• Technique sensitive</li> <li>• P1 cooperation</li> </ul>

## Treatment Plans Option-4

### Long-span bridge



- #11 #22 EXT
- #13-12-X-X-23 bridge

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Simple</li> <li>• No need crown lengthening</li> <li>• Esthetic – UA</li> </ul>	<ul style="list-style-type: none"> <li>• #11 #22 ext -&gt; long term bone resorption</li> <li>• #12 #13 #23 preparation</li> <li>• Not easy to clean for long span bridge</li> </ul>

Patient's choice

## Tentative Treatment

2021/11/24	Perio Tx
2021/12/27	Perio F/U
2022/02/14	#11 #22 ext

- Oral hygiene reinforcement
- Periodontal Tx
- OHI
- Retained root #11 #22 -> ext



## Periodontal Examination

2021.12.27

### Upper Right Area

Distal		Buccal												Mesial							
Tooth	18	17			16			15			14			13			12			11	
A.L.					4	6	4	3	5	4	2	2	2	2	2	1	2	2	1		
P.D.					3	3	3	3	4	4	3	2	3	3	3	3	3	3	3		
P.D.					3	2	3	3	3	4	4	3	3	4	3	3	4	3	3		
A.L.					4	5	4	3	3	3	4	3	3	1	1	1	1	1	1		
Mobility																					
F.I.																					
Distal		Palatal												Mesial							

### Upper Left Area

Mesial		Buccal												Distal							
Tooth	21	22			23			24			25			26			27			28	
A.L.					2	1	2	7	3	5	3	3	3	4	6	6					
P.D.					3	2	3	7	2	6	3	3	3	3	4	4					
P.D.					2	2	2	7	2	6	4	2	3	3	2	3					
A.L.					1	2	2	7	2	5	3	2	3	3	4	5					
Mobility								< Gr I.													
F.I.																					
Mesial		Palatal												Distal							

### Lower Left Area

Mesial		Lingual												Distal							
Tooth	31	32			33			34			35			36			37			38	
A.L.	2	2	2	2	2	3	2	2	3	3	2	3	3	2	3						
P.D.	2	2	2	2	2	3	2	2	3	3	2	3	3	2	3						
P.D.	3	2	2	2	2	3	3	2	3	3	2	2	3	2	3						
A.L.	3	2	2	2	3	3	3	2	3	3	3	2	3	3	3						
Mobility																					
F.I.																					B-I, L-I
Mesial		Buccal												Distal							

## Lower Right Area

Distal		Lingual														Mesial				
Tooth	48	47	46			45			44			43			42			41		
A.L.			3	2	3	2	4	5	3	2	3	3	2	3	2	2	3	2	2	3
P.D.			3	2	3	2	4	5	3	2	3	3	2	3	2	2	3	2	2	3
P.D.			2	2	3	2	2	3	2	2	3	3	2	2	2	2	4	3	2	3
A.L.			2	3	3	4	5	4	2	3	3	3	2	2	2	2	4	3	2	3
Mobility																				
F.I.																				
Distal		Buccal														Mesial				

## Treatment Sequence

### Intraoral photo after tentative Tx

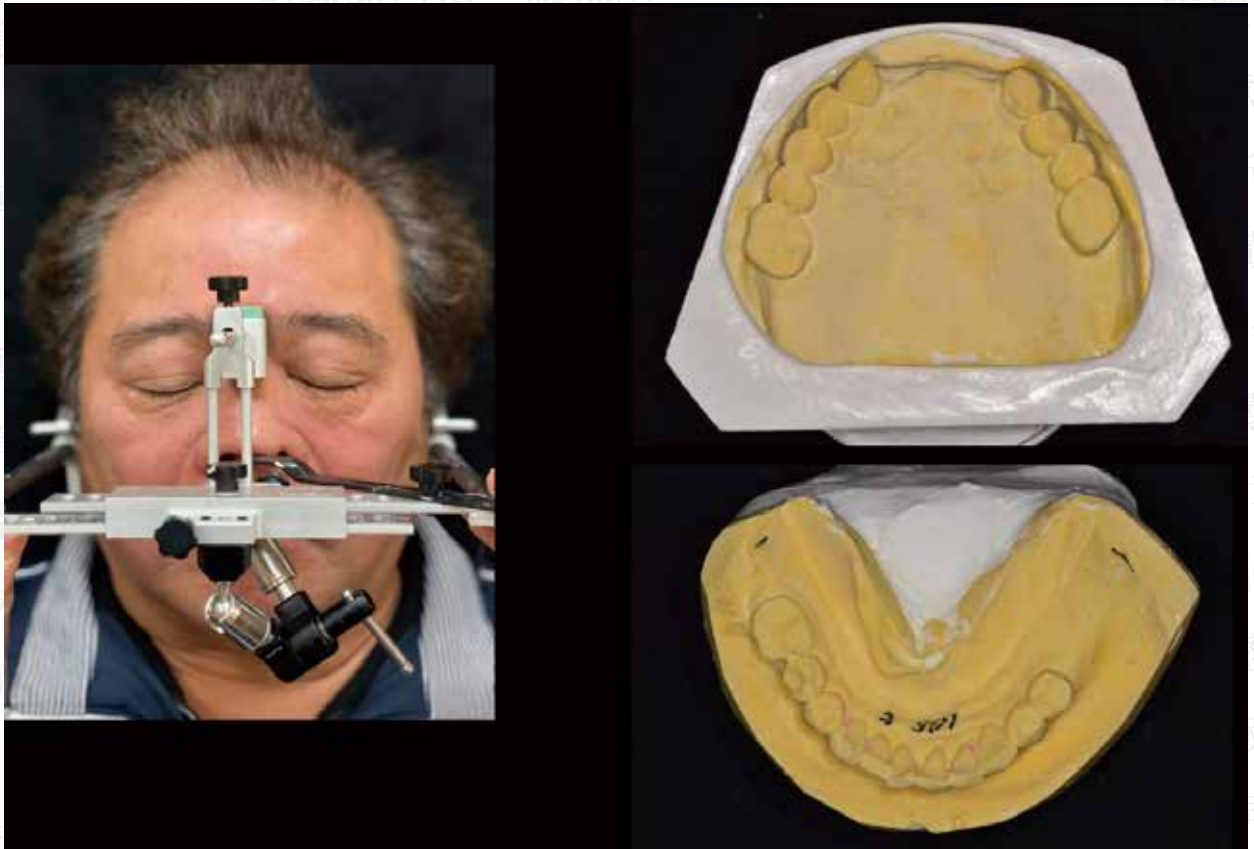
2021/11/16	OPD 1st visit and Tx plan discussion
2021/11/24	Perio Tx
2021/12/27	Perio F/U
2022/02/14	#11 #22 ext





2022/06/02

upper and lower alginate impression, facebow transfer take biting with Futar D for diagnosed wax up



2022/06/14 (GP) wax up



2022/06/14 wax up



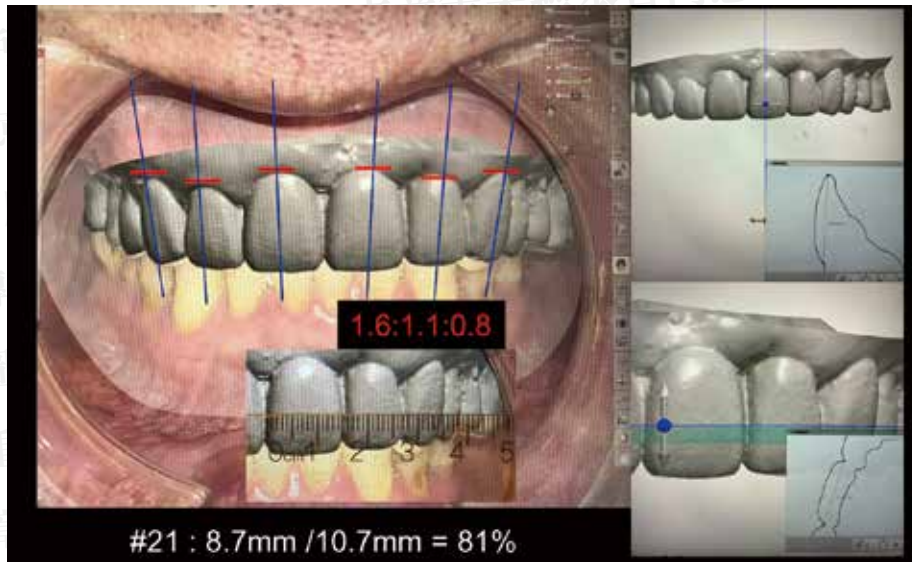
2022/06/14

Digital superposition wax up – Digital smile design



2022/06/14

wax up , DSD, tooth analysis



2022/07/18

#12 #13 #23 prepare and #13-12XXX-23 temp bridge fabrication



病例讨论





2022/08/11	F/U
2022/11/28	F/U



2022/11/28	Check cement wash-out, Check temp thickness
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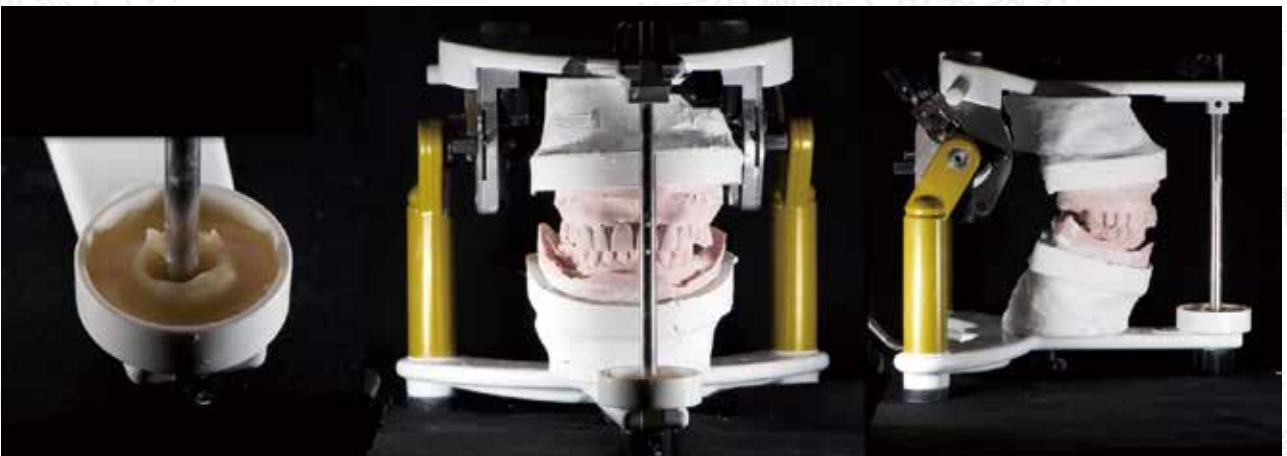


	13	connector	12	connector	11	connector	21	connector	22	connector	23
<b>B</b>	1.5mm	W:6mm L:7mm	1.3mm	W:4mm L:7mm		W:4mm L:8mm		W:4mm L:7mm		W:6mm L:7mm	1.5mm
<b>L</b>	1.5mm		1.2mm						1.5mm		
<b>Edge</b>	2.3mm		2mm						2.4mm		

2022/12/28 (GP) Upper final impression with Examixfine and color selection



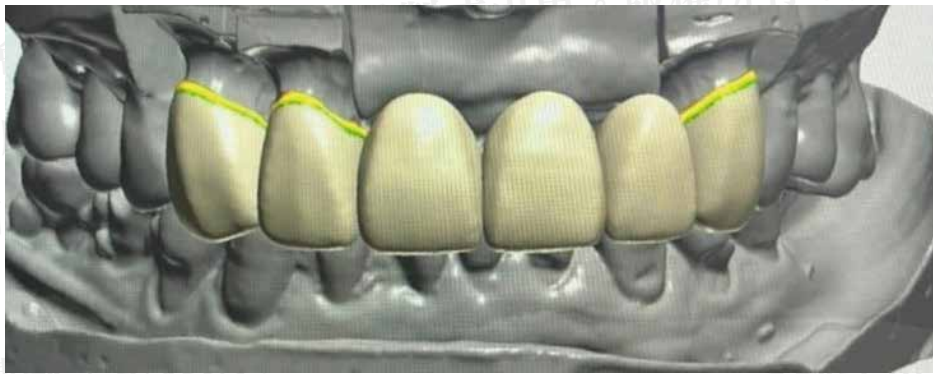
2022/12/28 Incisal guiding table



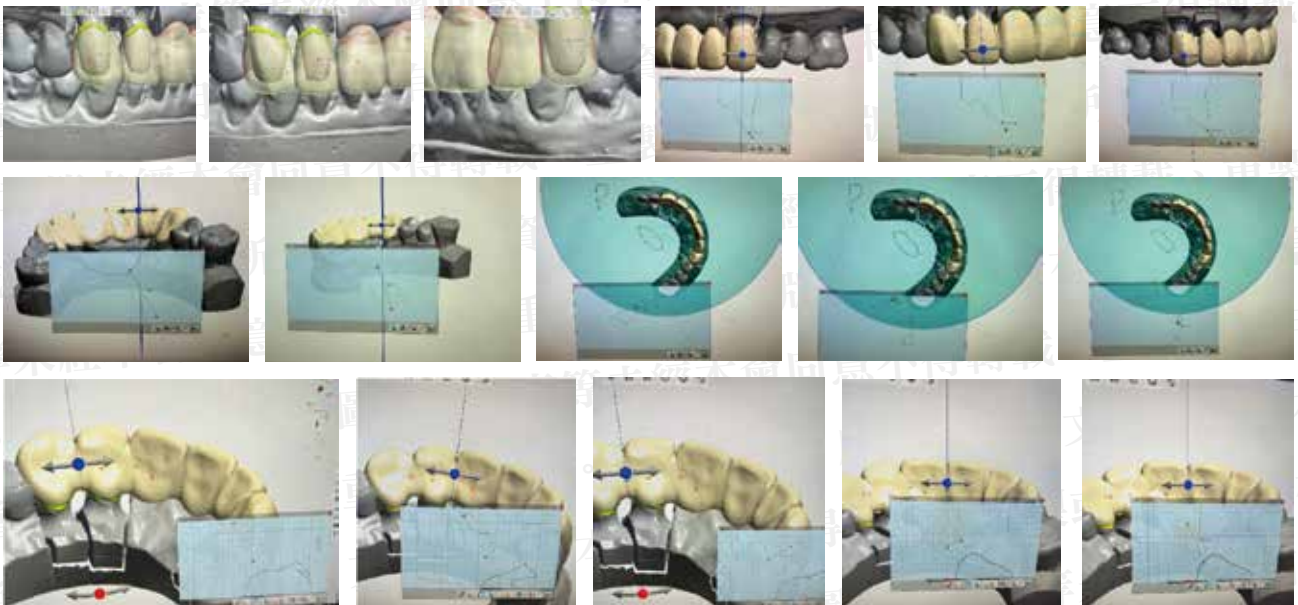
2022/12/28 (GP) Digital scan of temp and pontic



2022/12/30 (GP) Superposition and CAD



2022/12/30 Check connector and thickness of CAD/CAM definitive prosthesis



# Evident base of long-span Multilayer Zirconia

## 比較zirconia和metal bridge framework的5年RCT研究—Sailer(2017)

### Comparison of Fixed Dental Prostheses with Zirconia and Metal Frameworks: Five-Year Results of a Randomized Controlled Clinical Trial

Irma Sailer, Prof Dr Med Dent/Marc Balmer, Dr Med Dent/Julia Kling, Prof Emerita/Christoph Hans Franz Hammerle, Prof Dr Med Dent/Sarah Käfer/Daniel Stefan Thoma, PD Dr Med Dent

• 3 - 5 units

Int J Prosthodont 2017; Vol.30 P.426-428

Number of FDP units: Zirconia (ZC) or metal ceramic (MC) or metal ceramic.

**Table 1** Overview of the Examined ZC and MC FDPs

3 units	4 units	5 units	Total
ZC FDPs 33/32	6/9	1/9	40/39
MC FDPs 34/9	1/9	1/9	36/9
Total	67/23	7/9	74/32

**Table 2** Overview of the Applied Modified LSHS Criteria

LSHS (I)	Alpha (A)	Brown (B)	Challa (C)	Delta (D)
Framework fracture	No fracture of framework			Fracture of framework
Wearing fracture	No fracture	Chipping, but polishing is possible	Chipping down to the framework	Now restoration is needed
Occlusal wear	No occlusal wear on restoration or on opposite teeth	Occlusal wear on restoration or on opposite teeth < 2 mm	Occlusal wear on restoration or on opposite teeth > 2 mm	Now restoration is needed
Marginal adaptation	No probe catch	Slight probe catch, but no gap	Gap with some debris or cement requirement	Now restoration is needed
Anatomical form	Ideal anatomical shape; good proximal contact	Slightly over- or undercontoured; weak proximal contact	Highly over- or undercontoured; open proximal contact	Now restoration is needed

**Table 3** Five-Year Technical Outcomes: LSHS Ratings of the ZC and MC FDPs

	Alpha (A)	Brown (B)	Challa (C)	Delta (D)	#
<b>Framework fracture</b>					
ZC	100	0	0	0	1,800
MC	100	0	0	0	1,800
<b>Wearing ceramic chipping/fracture</b>					
ZC	80	21.9	2.9	0	1,800
MC	72.4	27.6	0	0	1,800
<b>Occlusal wear</b>					
ZC	2.9	22.5	20	0	1,800
MC	17.2	72.4	10.3	0	1,800
<b>Marginal adaptation</b>					
ZC	12.8	88	17.8	0	1,800
MC	26.1	65.5	10.3	0	1,800
<b>Anatomical form</b>					
ZC	90	7.5	3.5	0	1,800
MC	82.8	17.2	0	0	1,800

ZC = zirconia ceramic; MC = metal ceramic.

on zirconia frameworks.<sup>1,3</sup> No framework fractures and similar survival rates for MC and ZC were observed in the present study, which is in line with previous reports of a low rate of framework fractures for ZC FDPs.<sup>1</sup>

**Conclusions**

The sample size of this clinical study was limited, and the differences between the groups did not reach statistical significance for some parameters. Considering this, the present data still indicate that ZC can serve as an alternative to MC for posterior FDPs.

## Long-span zirconia Survival rate(2012)

### Clinical performance of long-span zirconia frameworks for fixed dental prostheses: 5-year results

M. SCHMITTER, K. MUSSOTTER, P. RAMMELSBURG, O. GABBERT & B. OHLMANN

**Table 1** Span lengths of the fixed dental prostheses (FDPs), and failures after 5 years

Group (no.)	Span length (mm)	Number of FDPs	Number of anchor teeth	Location	Percentage	Type of failure
36	4, 5, 5, 4	2, 5, 5, 3	4 maxilla	19.3	One chipping	One documentation
37	5, 5, 5	2, 5, 3	2 maxilla	100	One occlusal wear, maxilla	1 maxilla
38	5, 5, 5, 5	2, 5, 5, 3	All maxilla	10.7	Two chipping	One occurrence of documentation, maxilla
39	5, 5	5, 3	1 maxilla	6.7	One occurrence of documentation, maxilla	1 maxilla
40	5, 5, 5	2, 5, 5, 3	2 maxilla	9.3	One occurrence of documentation, maxilla	One fracture, maxilla
41	4	5, 5, 5, 3	2 maxilla	19.3	One occurrence of documentation, maxilla	One fracture, maxilla
42	3	5, 5, 4	3, 5, 3	2 maxilla	100	Two chipping teeth in maxilla
43	3	5, 6, 7	2, 5, 4	2 maxilla	100	Two chipping one in the maxilla and one in the mandible
45	3	5, 7	5, 3	1 maxilla	6.7	One fracture
46	3	5, 5, 4	2, 5, 3	1 maxilla	100	One occurrence of chipping, maxilla
47	3	5, 5, 4	2, 5, 3	2 maxilla	100	One fracture of an abutment tooth

- 36 to 46 mm
- 4 - 7 units
- connector dimensions : 9 mm<sup>2</sup>
- 11 of 30 : anterior teeth
- Survival rate: 82%
- 2 failures were in the incisor region, and 14 failures were in the molar region.

for failure. Both length [P = 0.05, exp(B) = 1.22] and location [P = 0.019, exp(B) = 4.09] of the FDP were identified as risk factors for failure. Thus, risk of failure was greater for long-span FDPs in the molar region than for FDPs in the anterior region.

1. Both length [P = 0.05] and location [P = 0.019] of the FDP were identified as risk factors for failure.
2. Thus, risk of failure was greater for long-span FDPs in the molar region than for FDPs in the anterior region.

## Zirconia Connector dimension (2022)

ORIGINAL ARTICLE

ACP PROSTHODONTISTS

An in vitro trial on the effect of arch form on connector size requirements in long span anterior zirconia fixed dental prostheses

Ryan J. Cello DMD, MS, FACP<sup>1</sup> | Cynthia Aka-Bolton DMD, FACP<sup>1</sup> | Walter G. Dinicola DDS, FACP<sup>2</sup> | Karl Wenger PhD<sup>3</sup>

**TABLE 1** Results of a Fisher's exact test to compare 9 mm<sup>2</sup> and 12 mm<sup>2</sup>

Connector mm <sup>2</sup>	< 5,000,000 cycles (broke) N (%)	≥ 5,000,000 cycles (didn't break) N (%)	p-Value
9	5 (23.8%)	16 (76.2%)	1.00
12	4 (19.1%)	17 (80.9%)	

**TABLE 2** Results of a Fisher's exact test comparing all six groups

FDP group	< 5,000,000 cycles (broke) N (%)	≥ 5,000,000 cycles (didn't break) N (%)	p-Value
NC/9P	4 (27.3%)	10 (72.7%)	0.219
NC/9A	1 (6.9%)	13 (93.1%)	
DC/9P	3 (20.0%)	12 (80.0%)	
DC/9A	1 (6.9%)	13 (93.1%)	
DC/12P	1 (6.9%)	13 (93.1%)	
DC/12A	1 (6.9%)	13 (93.1%)	

**TABLE 3** Results of a Fisher's exact test comparing all six groups (combined)

Connector dimension	< 5,000,000 cycles (broke) N (%)	≥ 5,000,000 cycles (didn't break) N (%)	p-Value
9 mm	5 (23.8%)	16 (76.2%)	0.007
12 mm	4 (19.1%)	17 (80.9%)	

combined (p = 0.007), indicating that an anterior connector of 9 mm had a significantly greater proportion of FDPs that fractured (Table 3).

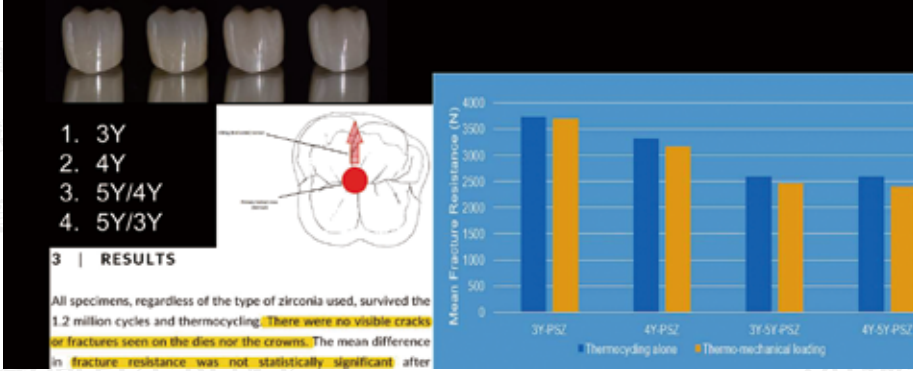
- 6 units, 42 samples
  - Connector : 9 mm<sup>2</sup> / 12 mm<sup>2</sup>
  - Cantilever: 7/10/13mm
  - (4Y-TZP) (Emax ZirCAD MTML; Ivoclar Vivadent)
1. Not statistically significant when comparing the 9 with the 12 mm<sup>2</sup> connector size (p = 1.00).
  2. 7 mm cantilever with the 10 and 13 mm cantilevers combined (p = 0.0407) indicating that a 7 mm anterior spread of the pontics showed a significantly greater proportion of fixed partial dentures that fractured.
- an anterior versus posterior FDPs. These results suggest that the cantilever effect from anterior pontics is unlike what is typically seen with long span restorations with distal extensions in the posterior area of the mouth. Therefore, applying the same principles to incisor pontics cantilevered anteriorly would be inappropriate. Interestingly, unlike typ-

病例讨论

# Multilayer zirconia fracture (2022)

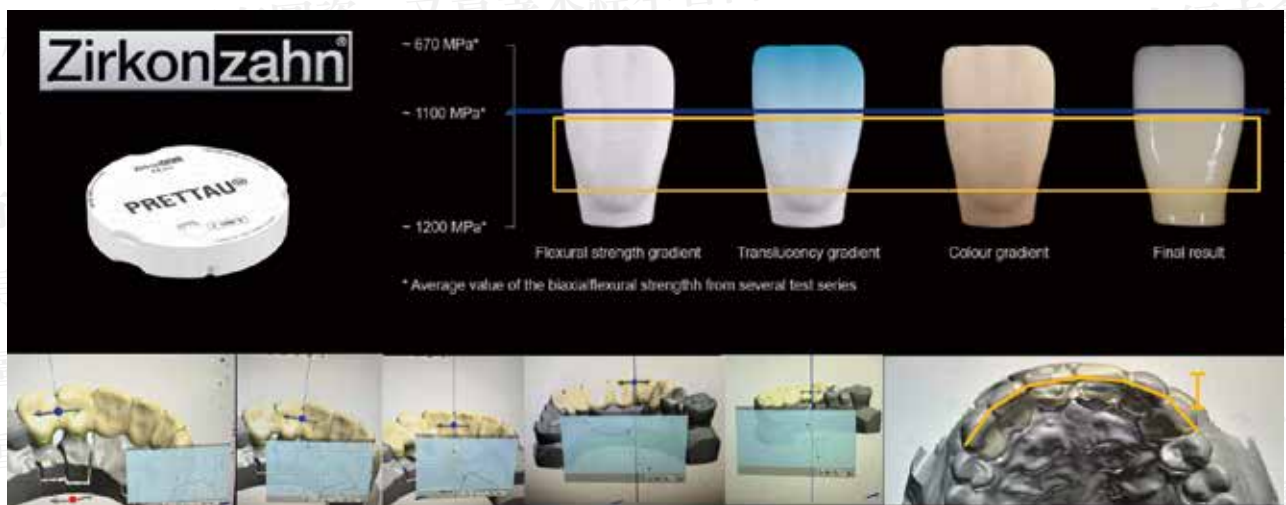
Submitted: 2 January 2022 | Revised: 26 February 2022 | Accepted: 12 March 2022  
 DOI: 10.1111/jclm.12907  
**RESEARCH ARTICLE** WILEY  
**Survivability and fracture resistance of monolithic and multi-yttria-layered zirconia crowns as a function of yttria content: A mastication simulation study**  
 Zaid Badr DDS, MS, MFRCSI<sup>1</sup> | Lee Culp CDT<sup>2</sup> | Ibrahim Duqum DDS, MS, FICD<sup>3</sup> | Chek Hai Lim PhD<sup>4</sup> | Yu Zhang PhD, FADM<sup>4</sup> | Talsoor A. Sulaiman DDS, PhD<sup>2</sup>

- 20 samples,
- Occlusal reduction 1.5mm
- **Chewing** : 110 N , 1.4 Hz for 1.2 million , 1mm shift
- Thermocycling (10,000 cycles, 5 – 55 °C
- Loading until fracture



2022/12/30

Check connector and thickness of CAD/CAM definitive prosthesis



	13	C	12	C	11	C	21	C	22	C	23
<b>B</b>	1.8mm		1.6mm								1.8mm
<b>L</b>	1.4mm	13mm <sup>2</sup>	1.3mm	12mm <sup>2</sup>		11mm <sup>2</sup>		12mm <sup>2</sup>		13mm <sup>2</sup>	1.4mm
<b>Edge</b>	1.8mm		2.3mm								2mm
<b>Length</b>	43,24mm										
<b>cantil-lever</b>	10.16mm										

2023/01/12

Try bisbake



2023/01/17

Glazing - definitive prosthesis



2023/01/17

Glazing, try definitive prosthesis



2023/01/17

FM definitive prosthesis delivery



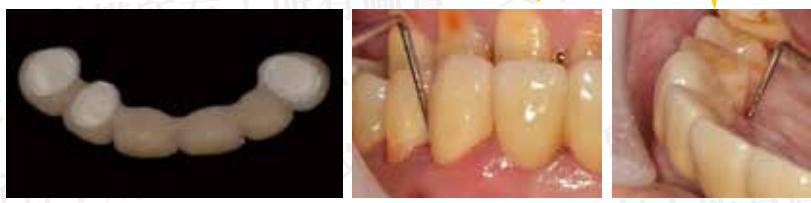
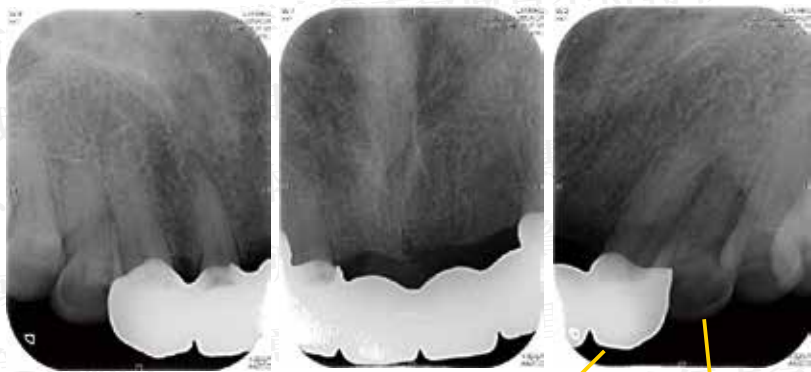


### Maintenance and prognosis

- Improve oral hygiene
- Perio regular F/U



2023/04/27 F/U, Check cement wash-out, FM Fixed prosthesis PS with U200



2023/09/07

8M F/U



### Treatment Sequence



Initial



Wax up



Temp



Final



Initial



Final



# Treatment Sequence

2021

11



First visit

2022

2



#11 #22 rr EXT

6



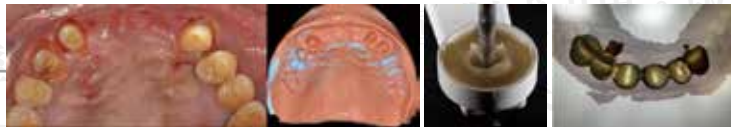
Wax up & DSD

7



#11 #12 #23 prepare and temp bridge

12



#11 #21 #22 final impression

12



CAD/CAM

2023

1



Final FDPs Delivery and try set

4



Check cement wash-out and Permanent set with U200

9



8M f/u

## Q & A

**Q：**造成病人原本前牙假牙 #11x22 斷裂的主因是甚麼？病人的 etiology 為何？

**A：**從病人一開始帶斷掉的舊假牙來看，支台齒 #11 #22 下大面積的 sub-crown caries 是導火線，再加上病人咬太硬或者咬力過大造成舊牙橋斷裂；而從病人口內有 generalized attrition 以及 Supra-eruption of lower anterior teeth，病人咬合力應該不小，etiology 應該是有 occlusal trauma 的情況，病人下顎前牙 Supra-eruption of lower anterior teeth 有建議病人要修齊，以避免過多的咬力施加在前牙顎測的咬合面上，但病人一開始表示除了主訴治療區域之外，想盡量保留自己的自然牙，不想修其他的牙齒。

**Q：**使用數位方式記錄整個 temporary bridge 的外型包括顎測咬合部分，是否就不需要傳統的 incisal guiding table？

**A：**Incisal guiding table 的目的其實是要讓技師能夠模擬出臨時假牙在前牙咬合面的咬合功能以及外型，然後方便轉換到正式假牙的製作，是做為臨床醫師端跟技工端之間很重要的溝通方法跟步驟。若技工端在現有的數位 CAD/CAM 流程之下，針對口掃一整組臨時假牙包括 pontic 以及顎側咬合面，來達到臨床跟技工端之間假牙製作溝通的功能，並能夠 100% 完整複製出 temporary bridge 的外型的話，也許就不需要傳統的 incisal guiding table。但本案例即使有搭配使用數位的方法，在完成正式假牙之後，將正式跟臨時假牙的桌掃檔互相做疊合比較，仍然會看到很細微的誤差，但整體外形已經能夠非常接近 temp 的外型，簡單的說若目前數位牙科的技術尚未能夠 100% 完全複製出 temp 的外型話，傳統的 incisal guiding table 還是有其必要。

**Q：**#24 poor prognosis，未來若因為嚴重牙周病需要拔除，針對 #24 的治療計畫為何？

**A：**#24 若因 poor prognosis 最後無法留下的話，會規畫拔除後使用 implant 來做贗復的治療計畫。

**Q：**病人缺少很多後牙，對於如此長的 6 單位前牙牙橋贗復是否會帶來甚麼影響？

**A：**根據 Mutually protected occlusion 的理論，前牙的前突跟側移能保護後方牙齒收到過大的側方受力，反之，在最大咬合的情況下需要後牙來保護前牙避免過大的垂直咬合力。尤其針對 6 單位並且只有 3 顆隻台齒的長牙橋來說，後牙的保護是非常重要的。病人缺少所有的第二大臼齒且左下處還缺少 #36，其實在一開始討論治療計畫時就有跟病人討論過這一點，後牙缺牙的地方還是建議也要重建起來，以保護未來前牙製作完成的正式假牙；但病患一開始對於牙科治療缺乏信心且有幽閉恐懼症加上張口度又受限，堅持想先完成前牙主訴的治療後在來考慮後牙的重建。目前病患很滿意這組前牙 6 單位牙橋，在追蹤超過半年後也無不適，最後在持續溝通下也同意做 #36 implant 的治療，目前已在 8 月時完成 #36 implant 的植入，等待骨整合後完成後牙 #36 缺牙的重建。



# 案例後記

翁凱威

**記**得 2 年前剛接到這個案例時，患者林先生明確地表示希望用固定假牙的方式重建，看著口內以及 X-ray 中 #11 #22 的殘根 abutment，當下心中真是充滿了不確定性，腦海中浮現出好多不同的治療計畫：要做 forced eruption、CLP、還是植牙或者最單純的拔除後做長牙橋？在與牙周病科、矯正科醫師及患者討論後，由於林先生對牙科有某種程度的恐懼，加上有幽閉恐懼症，又因為過去吃檳榔以及口腔癌的病史，造成口腔黏膜纖維化，張口度只有達 2.5cm，病患在充分了解各個治療選項的優缺點後，很明確的表示希望能夠用最快的速度完成他想要的前牙區的牙科治療，最後他也就毫不猶豫地選擇將殘根拔除選擇做一個六單位長牙橋。

針對後牙區域，病人缺少所有的第二大臼齒且左下處還缺少 #36，其實在一開始討論治療計畫時就有跟病人討論過後牙咬合保護前牙的重要性，後牙缺牙的地方在一開始還是建議他也要同時重建起來，以保護未來前牙製作完成的正式假牙；但病患一開始對於牙科治療缺乏信心，且有幽閉恐懼症加上張口度受限，因此堅持想先完成前牙主訴的治療後在來考慮後牙的重建。目前病患很滿意這組已經完成的前牙 6 單位牙橋，在追蹤超過半年後也無不適，對基隆長庚的團隊更加有信心之後，持續溝通之下病患也跨出他心理的障礙邁出一大步，同意做 #36 implant 的治療，目前已在 8 月時完成 #36 implant 的植入，等待骨整合後完成後牙 #36 缺牙的重建。

感謝基隆長庚贗復補綴科以及牙周病科的專科醫師提供強大的後盾，而林先生在飲食習慣和清潔上也相當配合，中間臨時假牙也沒有斷裂跟破損，最後得以順利的完成正式假牙製作。此案例搭配不少數位 CAD/CAM 的流程，在新舊流程火花交替的治療過程中，也更了解數位設計在傳統牙科流程中代表的意義，以及 zirconia 材質的選用—包括強度以及美學表現方面等等的特性，都查閱了不少教科書以及最新的 paper 來幫助治療上的選擇跟決定，著實收穫良多，在過程中和專科醫師的討論，也讓我了解到更多贗復和協同治療的注意事項、治療程序的安排等等，是一個讓我學習到很多寶貴經驗的難得的案例。



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