

금속 · 도재수복물용 금속의 열처리 및 표면처리에 따른 변형에 관한 연구

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Abstract

An Experimental Study of Marginal Distortion Related to Heat Treatment and Surface Treatment in Metal Copings for Metal-Ceramic Restorations

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The purpose of this study was to observe the change of marginal distortion related to heat treatment and surface treatment in.

Thirty copings were made on the self-curing resin dies and twenty coping among them were treated by heat and surface grinding. All copings were adapted on the respective dies and then were invested into the plastic boxes with tray resin. Both coping and die invested in tray resin were cut through labio-lingually by a separating disc.

This cross-cutting surface was ground and polished.

Specimens were mounted on a light microscope and photographed. Marginal discrepancies were measured on photographs by a scale.

The obtained results could be summarized in the followings :

1. In all metal copings, the distortion of cervical margin was shown after heat treatment and surface treatment.
2. There were no statistically significant differences in marginal fitness between shoulder and deep chamfer.
3. There were no statistically significant differences in marginal fitness between labial margin and lingual margin in one die.
4. In case of the copings which were not treated with preheating and were treated with surface grinding, the marginal distortion shows a tendency to increase.

I. 서론

9-14)

1887 Charles Land

가

가 ¹⁾
1950 1970

II. 실험 방법

1. 주지대치형의 제작

2

, 가
가 가 ²⁾

(:
8mm, 9mm, 11 mm)
2

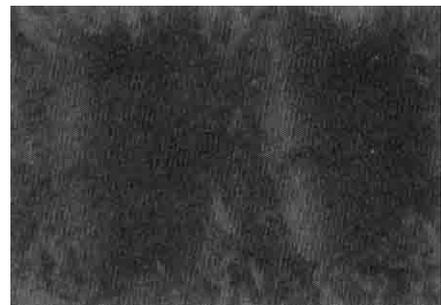
Johnstone⁵⁾

, 가
1.0mm shoulder
0.5mm chamfer
2.0mm
1.0mm
deep chamfer ,
chamfer 0.5mm
(1). 2.0mm

³⁴⁾

가 가
가 ⁵⁻⁸⁾

cement spacer



1.
: shoulder, chamfer
: deep chamfer, chmfer

2. 작업치형의 제작

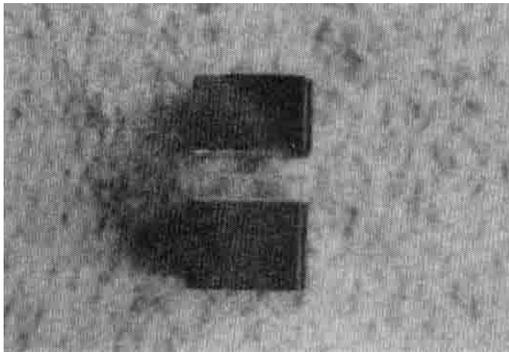
가 2
(2).
silicone
(Optosil,
Bayer, Dental Co.)

silicone
가
silicone
shoulder 15
deep chamfer 15
30

0.3 0.4mm, 0.5mm,
3mm 0.5mm



3.



2. 가 2

1
(15)
ring
(Optosil, Bayer Dental Co.)
ring

ring
inlay

wax

가

3. 납형의 제작

30 가
shoulder 1 deep 1mm
chamfer 1
(3).
Rexillum
가

shoulder 15
deep chamfer 15
30

(Jeneric/Pentron Inc.)

4. 시편의 제작

10 gauge
5
가
ring
(Hi-Temp, Whip Mix Corporation)
0.16
가
가
Rexillum
ring 5
50μm
aluminum oxide

5. 시편의 절단 및 측정방법

가
wax
(1.5 × 2.0 × 1.4cm) tray
가
carborundum disk
가
1,200 grit silicone carbide abrasive paper
가
가

(4).
200
15 , 30 (shoulder 15) scale
5 deep chamfer 1 (5). 가
가
가
scale

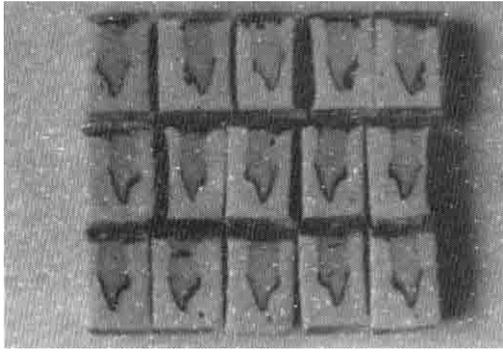
1.

실험군	시편수	순측변연의 형태	예비열처리*	표면처리**	본열처리*
제1군	5	shoulder	○	○	○
제2군	5	shoulder	×	○	○
제3군	5	shoulder	×	×	×
제4군	5	deep chamfer	○	○	○
제5군	5	deep chamfer	×	○	○
제6군	5	deep chamfer	×	×	×

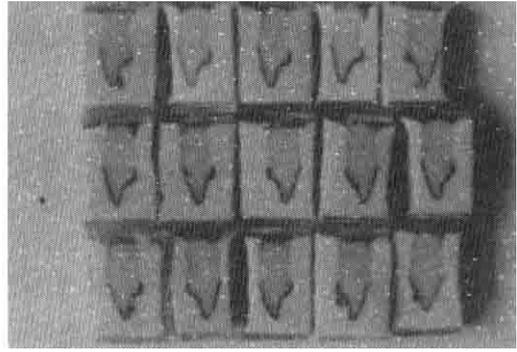
○ : 처리한 것, × : 처리하지 않은 것

* : 진공압(29 inch Hg) 상태, 1,200°F에서 1,800°F까지 올린다음 제거

** : aluminum oxide stone으로 도제가 소성될 표면 전체 연삭



A

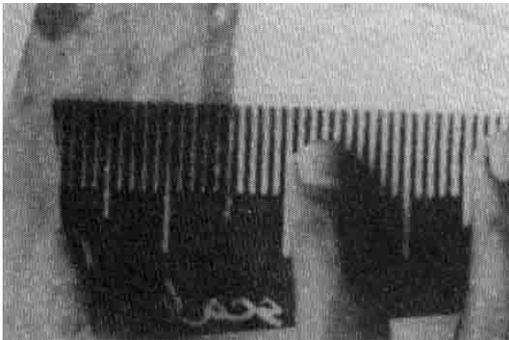


B

4.

A : shoulder

B : deep chamfer



5.

scale

III. 실험성적

2

2

가

(: 18.75 μ m).
가

2.

(: μ m, M \pm SD)

처리 방법			치형 I *		치형 II *		평균
예열	표면	본열	순측	설측	순측	설측	
유	유	유	28.00 \pm 9.08	22.00 \pm 7.58	18.00 \pm 6.71	27.00 \pm 13.96	23.75
무	유	유	26.00 \pm 10.84	46.00 \pm 11.40	29.00 \pm 15.57	25.00 \pm 6.12	31.50
무	무	무	17.00 \pm 10.37	19.00 \pm 4.18	21.00 \pm 11.94	18.00 \pm 5.70	18.75
평균			23.67	29.00	22.67	23.33	24.67
			26.33		23.00		

치형 I * : 순측변연 shoulder, 설측변연 chamfer

치형 II ** : 순측변연 deep chamfer, 설측변연 chamfer

각 군별 조사수 : 5

: 31.50 μ m) , (가

23.75 μ m) (: 2 () 가 (P<0.01) 가 (3).

shoulder chamfer 4 1 (F)가 7.083

deep chamfer chamfer (P<0.01), 가 Turkey-HDS Multiple range test

3. (2)

변 동 요 인	평방합	자유도	불편분산	분산비(F)	유의성(P)
예열, 표면 및 본열처리	1,650.833	2	825.417	7.195	0.002**
치형 I 및 치형 II	166.677	1	166.667	1.453	0.233
상호작용	280.833	2	140.417	1.224	0.302
소 계	2,098.333	5	419.667	3.658	0.006
나 머 지	6,195.000	54	114.722		
계	8,293.333	59	140.565		

** : P<0.01

4. (1)

요 인	평방합	자유도	불편분산	분산비(F)	유의성(P)
예열, 표면 및 본열처리	1,650.8333	2	825.4167	7.083	0.0018**
급 냉	6,642.5000	57	116.5351		
계	8,293.3333	59			

** : P<0.01

5. (t-)

구 분	평균치의 차	자유도	t-값	유의성(P)
치형 I 과 II 의 순측비교	1.0000	28	0.24	0.811
치형 I 과 II 의 설측비교	5.6667	28	1.25	0.222
치형 I 에서 순측 및 설측비교*	-5.3333	14	-1.14	0.275
치형 II 에서 순측 및 설측비교*	-0.6667	14	-0.20	0.843

*작 표본에 의한 평균치 비교

(P<0.05). 가 가 , 가

5). t- (가 ¹⁶⁾ ,

가 , shoulder ,

가 chamfer 18)

가 deep chamfer

chamfer 가

19)

IV. 총괄 및 고찰

가 가

16,17) 가 가

가 shoulder, shoulder

burnishing with bevel, deep chamfer deep chamfer

가 with bevel ^{7,8,11)} Kuwata

가 bevel 가

가 가 20)

가 shoulder deep chamfer

가 가

tray cement , cement

degassing

가

가 가
가 가

shoulder deep

chamfer

tray

가

shoulder

deep chamfer

가

가
17 29 μ m

cement

cement

shoulder

deep chamfer

scale

가

가

가

가

가

가

가 (18.75 μ m),
가

가

가

가

Yamamoto¹⁹⁾가

가
가
가

가

가

Yamamoto¹⁹⁾가
, Ni-Cr

가

V. 결 론

가

30

가

가

가
가

1.

2. Shoulder deep chamfer
가 .
3. 가 .
4. .

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