

수종 레진 인공치의 마모도에 관한 연구

원광의료원 치과대학병원 중앙기공실

=Abstract=

A Study on the Wear of Artificial Resin Teeth

Lee, Jung Oh

Dept. of lab. Center, Dental Hospital, Wonkwang Medical Center

The artificial resin teeth used for removable prosthesis have good physical properties, but they have great wear rate.

The purpose of this study is to compare the wear characteristics of several artificial resin teeth, such as Myerson teeth(Myerson Crop), Trubite IPN(Dentsply), Endura Posterio(Shofu), SR-Orthosit(Ivoclar), Trubite Biotone(Dentsply), Five samples of each resin tooth were abraded against natural teeth, type III gold for 150,000 cycles on the wear machine.

The results obtained were as follow

1. The wear rate of artificial resin teeth when opposing enamel was the lowest in Myerson teeth($8.60\mu\text{m}$), followed by Trubite IPN($41.30\mu\text{m}$), Endure poster($63.00\mu\text{m}$), SR-Orthosit($68.40\mu\text{m}$), Trubite Biotone($209.90\mu\text{m}$)
2. The wear rate of artificial teeth when opposing type III gold specimens was the lowest in Myerson teeth($13.50\mu\text{m}$) followed by Endura Posterio($14.75\mu\text{m}$), Trubite IPN($53.40\mu\text{m}$), SR-Orthosit($54.20\mu\text{m}$), Trubite Boitone($341.50\mu\text{m}$)

목 차

I. 서론

cross-linked network
interpenetrating-polymer network material
microfilled composite (Isosit-SR, Ivoclar AG/Vivadent, Schann/Liechtenstein)가 microfilled composite Bowen-fomlua matrix system
70nm fumed silica filler particle bisphenol A Glycidyl methacrylate(BIS-BMA) D 가

가 가

가 가

가

가 가

5

Schuyler

II. 연구재료 및 방법

1. 레진 시편 제작

5

가

(Trubyte Bioform IPN, Dentsply International, Inc., York, Pa)가

unfilled, highly cross-linked, interpenetrating polymer network polymer가

(cross-polymer)

second corss-linking polymer

Myerson teeth(Myerson teeth Crop., U.S.A.), Trubite IPN Teeth(Dentsply, U.S.A.), Endura posterio(Shofu, Japan), SR-Orthosit(Ivoclar, Liechtenstein), Trubite Biotone(Dentsply, U.S.A.) , 5 가
.(Table 1)

3mm

10mm

Table 1. Resin denture teeth used in this study

Product name	Type	Manufacturer	Nation	Code
Myerson teeth	high strength	Myerson teeth Crop.	U.S.A.	MT
Trubite IPN teeth	IPN	Dentsply	U.S.A.	IPN
Endura Posterio	high abrasion resistance	Shofu	Japan	EN
SR-Orthosit	high strength	Ivoclar	Liechtenstein	SR
Trubite Biotone	conventional	Dentsply	Dentsply	BT

90°

0.5mm

가 (Ortho-jet resin, Lang, U.S.A.)

3mm

.(Fig. 1)

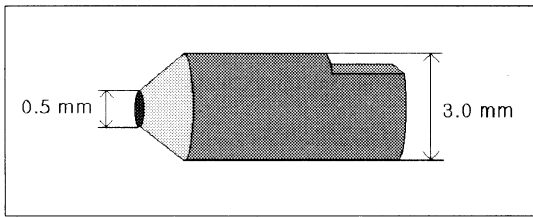


Fig. 1 Diagram of the restorative material specimen

가

220CW 600CW

3
5mm,

wax 0.5mm 가

5mm

220CW 600CW

3

3. 마모시험 및 측정

178g

2.5mm

3mm

8mm

.(Fig. 2)

(71DG2-6G, Dea Kyung Elec., Korea)

220V

600CW
가

10mm

가

3mm

2. 치아 및 금합금 시편의 준비

표

가

50ml 가
가

4ml

III. 연구성적

1. 자연치에 대한 레진치의 마모도

(CX7, Han Young co., Korea)
가 가

4

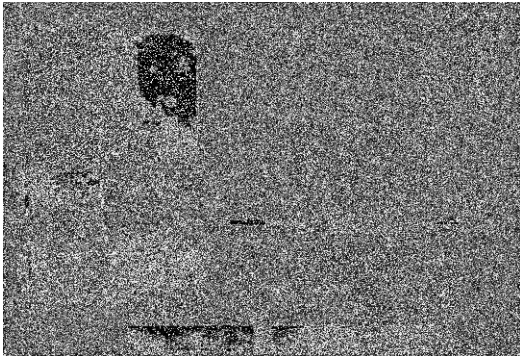


Fig. 2 Wear testing machine

(Fig. 3),

5

(PB-1B ; Mitutoyo Co., Japan)
SPSS(for Window Release 6.1.2)

ANOVA Scheff's
가

test(p = 0.05)

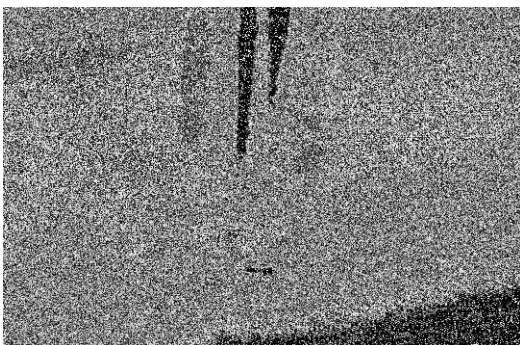


Fig. 3 Prepared specimens mounted in wear testing machine ready for testing.

MY(Myerson teeth)가

4.30 μ m 가

BT(Trubite Biostone), IVO(Ivoclar teeth), EN
(Endura Posterio), IPN(Trubite IPN teeth)

.(Table 1., Fig. 1)

Table 1. Wear of resin teeth to natural teeth specimen after 50,000 cycles Unit : μ m

Restorative material	Resin teeth	Number	Mean	SD
Natural teeth	MY	10	4.30	2.36
	IPN	10	22.80	8.05
	EN	10	35.60	16.19
	IVO	10	36.40	9.17
	BT	10	98.00	22.30

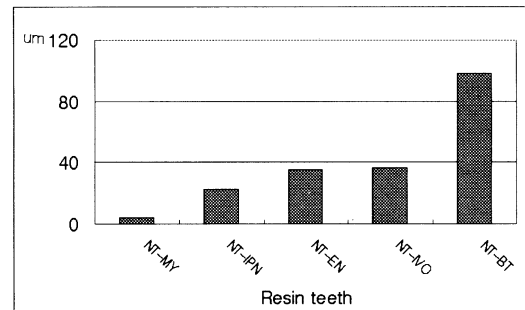


Fig. 1. Wear fo resin teeth to natural teeth specimens after 50,000 cycles

15

My(Myerson teeth)가

8.60 μ m 가

BT(Trubite Biostone), IVO(Ivoclar teeth), EN
(Endura Posterio), IPN(Trubite IPN teeth)

.(Table 2., Fig. 2)

Table 2. Wear of resin teeth to natural teeth specimen after 150,000 cycles Unit : μm

Restorative material	Resin teeth	Number	Mean	SD
Natural teeth	MY	10	8.60	2.95
	IPN	10	41.30	12.76
	EN	10	63.00	30.53
	IVO	10	68.40	10.72
	BT	10	209.90	45.83

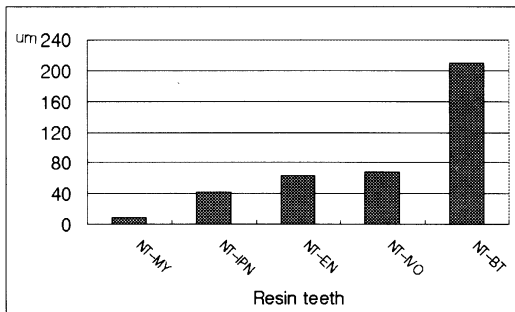


Fig. 2. Resin teeth to natural teeth after 150,000 cycles

2. Gold plate에 대한 레진치의 마모도

Gold plate

5

EN(Endura posterio teeth)가

8.20 μm 가

BT(Trubite

Biostone), IVO(Ivoclar teeth), IPN(Trubite IPN teeth), MY(Myerson teeth), EN(Endura Posterio)

.(Table 3. Fig. 3)

Table 3. Wear of resin teeth to Gold specimen after 50,000 cycles Unit : μm

Restorative material	Resin teeth	Number	Mean	SD
Gold plate	EN	10	8.20	3.33
	MY	10	8.50	4.74
	IPN	10	20.50	11.72
	IVO	10	31.50	23.98
	BT	10	126.50	28.17

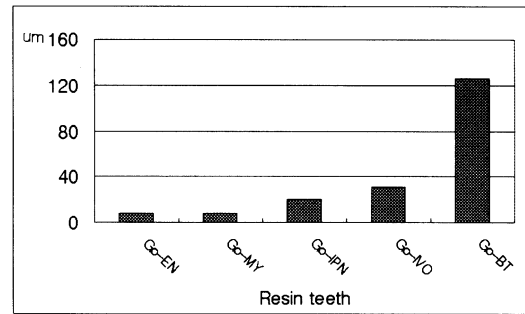


Fig. 3. Wear fo resin teeth to gold specimens after 50,000 cycles

15 Myerson teeth 가
13.50 μm 가 , BT(Trubite
Biostone), IVO(Ivoclar teeth), IPN(Trubite IPN
teeth), EN(Endura Posterio), MT(Myerson
teeth) .(Table.
4, Fig. 4)

Table 4. Wear of resin teeth to gold specimen after 150,000 cycles Unit : μm

Restorative material	Resin teeth	Number	Mean	SD
Gold plate	MY	10	13.50	7.82
	EN	10	14.75	6.99
	IPN	10	53.40	22.56
	IVO	10	54.20	26.31
	BT	10	341.50	37.50

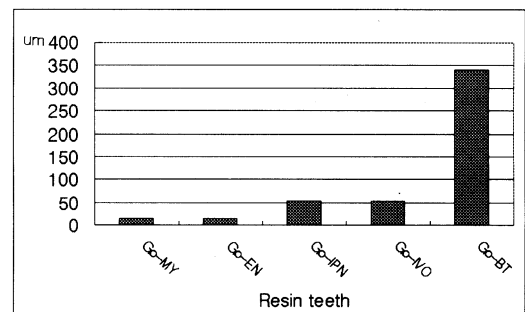


Fig. 4. Wear of resin teeth gold specimen after 150,000 cycles

Table 5. Wear of resin teeth after 150,000 cycles

Resin teeth	Gold		Natural teeth	
	Mean	SD	Mean	SD
Trubite IPN teeth	53.40	22.56	41.30	12.76
Ivoclar teeth	54.20	26.31	68.40	10.72
Endura Posterio	14.75	6.99	63.00	30.53
Myerson teeth	13.50	7.82	8.60++	2.95
Trubite Biotone	341.50	37.50	209.90	45.83

unit : μm

IV. 총괄 및 고찰

가 가
가

가

가 (interpenetrating polymer network : IPN)

가 1970 Ivoclar
Isosit가 100%
UDMA

가 Mohd
(adhesive), (abrasive),
(erosive), (impact),
(corrosive), Mahalick
(frictional),

Ekfeldt ilos
(surface fatigue),
(tribochmical reaction)
가 가

Mckinu sms 가

가
가가
Ekfeldt ilo
가
가
가

가

in vivo in
vitro in vivo

in vitro 가

가
(sliding-enduced wear testing apparatus)
pin-on-rotating-disc sliding-
wear test apparatus
(toothbrush abrasion machine)

(replica technique)
(remounting)

3 , , profilometry , 가
 , ,
 2.5mm

가
 가

V. 결 론

가 Degular Natural teeth
 가
 Winkler Kham
 가 , Ogle
 trubite IPN teeth가 Coffey
 Whitman Trubite IPN teeth
 . Stattanon SR-Isosit 가
 가 2
 가 Von Fraunhofer SR-
 Isosit 가 Trubite IPN 2
 가
 가

(Trubite Biotone)
 (Ivoclar teeth, Trubite IPN teeth,
 Myerson teeth, Endura Posterio)
 III

1. Myerson teeth(8.60 μ m)가
 가 Trubite IPN(41.30 μ m),
 Endura Posterio(63.00 μ m), Ivoclar teeth
 (68.40 μ m),
 Trubite Biostone(209.90 μ m) 가
2. Myerson teeth
 (13.50 μ m)가 가 Endura Posterio
 (14.75 μ m), Trubite IPN(53.40 μ m), Ivoclar
 teeth(54.20 μ m), Trubite Biotone
 (341.50 μ m) 가

참 고 문 헌

(abrasion)
 (facigue type)
 Trubite
 Biotone 가
 가 Endura Posterio,
 Myerson teeth, Ivoclar teeth, Trubite IPN

1. 황종우, 정재현, 고영무. 4종 아크릴릭 레진
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