

TORP의 안정성 증진을 위한 이소골재건술과 결과

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Ossiculoplasty in Difficulty : A Method to Improve Stability of TORP

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ABSTRACT

Background and Objectives : Primary goals of surgery for chronic ear disease are infection control and hearing restoration. When performing ossiculoplasty with total ossicular replacement prosthesis (TORP), it is difficult to keep the prosthesis stable. We intended to establish a method for stabilizing TORP in ossiculoplasty and to evaluate the results of the procedure. **Subjects and Method** : Thirty nine cases of ossiculoplasty performed between January 2000 and February 2003 were analyzed. The follow-up period was from 6 to 31 months (mean 13.1). The pure tone average threshold of the frequencies of 0.5, 1, 2, 3 kHz was used to evaluate results. The degree of hearing improvement, previous mastoid operation method, disease, and extrusion rate of prosthesis were analyzed. To stabilize the TORP, we made a hole in the tragal cartilage and put the shaft of the prosthesis into the hole. **Results** : A successful hearing gain was defined as a postoperative air-bone gap of ≤ 20 dB. According to this criteria, the success rate was 43.6%. Averages of pre and postoperative air conduction were 57.6 dB and 47.1 dB, respectively. The degree of hearing improvement according to the types of mastoid surgery were 48.1% and 33.3% for intact canal wall mastoidectomy and open cavity mastoidectomy, respectively. Four patients underwent reoperation. The findings were 2 cases of short TORP and 2 cases of empty middle ear space, but prostheses were stable in each case. There was one case of extruded prosthesis (2.6%). **Conclusion** : With our method, TORP was kept stable in the oval window niche. However, for hearing improvement, other factors such as middle ear mucosa status or Eustachian tube function are important and further investigation is needed. (Korean J Otolaryngol 2004;47:530-4)

KEY WORDS : Ossicular replacement · TORP · Cartilage.

Group	Number of Cases	Success Rate (%)	Mean Air Conduction (dB)	Mean Bone Conduction (dB)	Air-Bone Gap (dB)
Intact Canal Wall Mastoidectomy	12	48.1%	57.6	47.1	10.5
Open Cavity Mastoidectomy	9	33.3%	57.6	47.1	10.5
Total	21	43.6%	57.6	47.1	10.5

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2000 1 2003 2

TORP (: 0.6 mm)
 TORP , 가
 , 6
 가 17 , 가 22 , 가 31 (13) , TORP
 17 65 , 43 , Rosen pick TORP
 TORP TORP
 TORP gelfoam
 (staged) (Fig. 1).
 가
 1 , 3 , 6 1
 가
 polycel(Austin, Xomed®) 1995 Committee on Hearing
 and Equilibrium 0.5, 1, 2, 3 kHz
 8)
 TORP
 TORP
 가 20
 dB 6)12)16)
 1/2
 TORP가 가 30 dB
 20 gauge spinal needle(: 0.8
 mm) Parker blade(#15)
 3.0x1.5 mm TORP
 Chi - square test
 (p<0.05) .

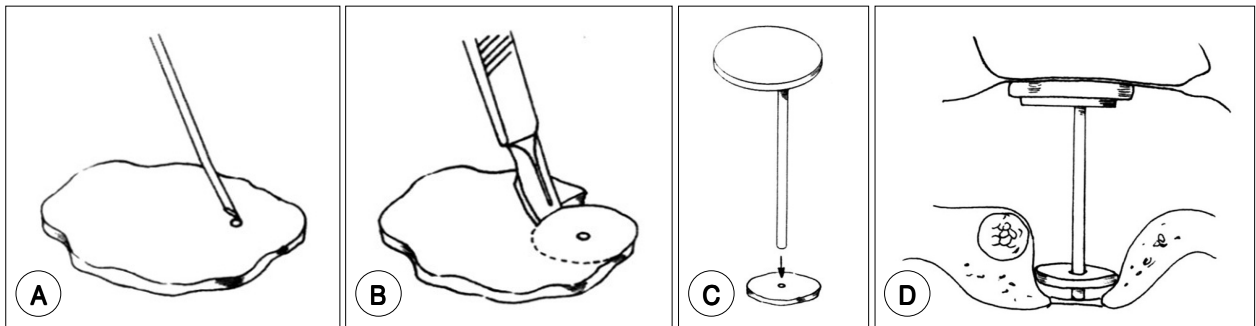


Fig. 1. This figure shows our method. After tympanomeatal flap elevation, tragal cartilage is harvested. A : A hole is made with a 20-gauge spinal needle in the corner of the tragal cartilage. B : About 3.0x1.5 mm sized cartilage piece is made with a #15 blade. C : The shaft of the TORP is inserted into the hole of the cartilage. D : TORP with cartilage is placed in the oval window niche. The cartilage piece made the TORP stable. The remaining cartilage is inserted between the TORP and the tympanic membrane to prevent extrusion. TORP : total ossicular replacement prosthesis.

TORP

(Fig. 2) 5 TORP가
TORP가 4

수술 후의 기도-골도 격차
10 dB - 39 10
(25.6%) , 20 dB 17 43.6%
11 (28.2%)
30 dB - (Table 1).

유양동 수술 방법에 따른 결과 비교

27
13 (48.1%) 20 dB -
(33.3%) 20 dB -
(Table 2).



Fig. 2. Temporal bone CT of the left side shows postoperative state of intact canal wall mastoidectomy and ossiculoplasty with TORP. The TORP (white arrow) is well placed in the oval window niche. TORP : total ossicular replacement prosthesis.

Table 1. Postoperative air-bone gap in ossiculoplasty using total ossicular replacement prosthesis (polycel, Xomed®) (n=39)

ABG (dB)	No. of cases	%
0 - 10	10	25.6
11 - 20	7	18.0
21 - 30	11	28.2
31 - 40	10	25.6
>41	1	2.6

ABG : air-bone conduction gap, TORP : total ossicular replacement prosthesis

병소에 따른 결과 비교

14 1 가
25
14 6 (42.9%)
20 dB -
11 (44.0%)
(Table 3).
11 (28.2%) - 가 30 dB
7
2 TORP가
(Table 4).
4
1 TORP
가 가 1 (2.6%)

Table 2. Comparison of the hearing level after ossiculoplasty using total ossicular replacement prosthesis according to the mastoid surgical technique

Surgical technique*	No. of cases	No. of Postoperative ABG <20 dB (%)
ICWM	27	13 (48.1)
OCM	12	4 (33.3)

*statistically not significant, ICWM : intact canal wall mastoidectomy, OCM : open cavity mastoidectomy, ABG : air-bone conduction gap

Table 3. Comparison of the hearing level after ossiculoplasty using total ossicular replacement prosthesis according to the disease

Disease*	No. of cases	No. of Postoperative ABG <20 dB (%)
COM without cholesteatoma	25	11 (44.0)
COM with cholesteatoma	14	6 (42.9)

*statistically not significant, COM : chronic otitis media, ABG : air-bone conduction gap

Table 4. Analysis of causes of the failure : postoperative air-bone gap >30 dB (n=39)

Causes of failure	No. of cases (%)
Middle ear mucosa hypertrophy	7 (18.0)
Short TORP*	2 (5.1)
Empty middle ear space*	2 (5.1)
Total	11 (28.2)

*Surgical finding of revision ossiculoplasty, TORP : total ossicular replacement prosthesis

2)¹²⁾ Chon
¹⁰⁾ Kim TORP
가 ¹³⁾

1 3
⁸⁾¹³⁾ Committee on Hearing and Equili-
brium 2
1 ⁹⁾

1 3 가 House
⁶⁾ 6 ⁷⁾

TORP Brackmann Slater
gelfoam TORP ²⁾³⁾ Fisch 11 30 dB -
Spandrel 7 (63.6%)
⁵⁾ Bellucci 가
¹⁹⁾ Pulec Sheehy
가 ¹⁵⁾

Blade Brackmann
가 ²⁾
가

가 ¹⁷⁾¹⁸⁾ 4
Tos

20 dB - ⁴⁾ Brackmann 30%
17 TORP ²⁾ Palva 가
가 30 dB 가 ¹⁴⁾

9
. 9 TORP가
TORP TORP가
TORP TORP가
43.6% 가

Dornhaffer 26 85%,¹¹⁾ Bayazit
58 43.1%,¹²⁾ House 560 57.5%
⁶⁾ Chon
24 33.3% TORP
¹⁰⁾ TORP

Fisch House
⁵⁾⁶⁾

Brackmann Bayazit

: TORP .

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