



**OSSIKULOPLASTIKADA PORP VA TORP PROTEZLARI:  
KLINIK-AUDIOLOGIK NATIJALAR VA ADABIYOT BILAN QIYOSIY  
TAHLIL (N=40)**

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*Annotatsiya: Kirish: Ossikuloplastika o'rta quloq suyakchalari zanjirining uzilishi yoki destruksiyasi sababli yuzaga keladigan konduktiv eshitish pasayishini jarrohlik yo'li bilan korreksiya qilish usulidir. Dunyo bo'yicha surunkali yiringli o'rta otit (CSOM) tarqalishi yuqori bo'lib, global prevalens taxminan 3,8% ( $\approx 297$  mln) deb baholanadi.*

*Maqsad: PORP va TORP protezlari qo'llanganda eshitish ko'rsatkichlarining o'zgarishini baholash hamda natijalarni xalqaro benchmark ma'lumotlari bilan qiyoslash.*

*Material va metodlar: 40 nafar bemor (60% ayol) ma'lumotlari tahlil qilindi. 23 (57,5%) bemorda PORP, 17 (42,5%) bemorda TORP qo'llandi. Audiologik baholashda AC PTA va ABG ko'rsatkichlari ishlatildi; ABG  $\leq 20$  dB mezonini muvaffaqiyat indikatorlaridan biri sifatida qabul qilindi.*

*Natijalar: Umumiy guruhda AC PTA  $54,5 \pm 9,3$  dB dan  $29,6 \pm 4,0$  dB gacha yaxshilandi ( $\Delta = 24,9 \pm 8,2$  dB). PORP guruhida ABG  $\leq 20$  dB natija 75% bemorlarda, TORP guruhida 62% bemorlarda qayd etildi.*

*Xulosa: Ossikuloplastika eshitishni sezilarli yaxshilaydi. Stapes suprastrukturasi saqlangan holatlarda PORP yuqori natija berishi, TORP esa murakkab destruksiya holatlarida muhim rekonstruktiv yechim bo'lishi ko'rsatildi.*

*Kalit so'zlar: ossikuloplastika, PORP, TORP, titanium protez, air-bone gap (ABG), surunkali o'rta otit, otoskleroz.*

**Abstract (English)**



**Background:** Ossiculoplasty is a reconstructive middle ear procedure aimed at correcting conductive hearing loss caused by ossicular chain discontinuity. Chronic suppurative otitis media (CSOM) remains a major contributor to preventable hearing loss worldwide.

**Objective:** To evaluate hearing outcomes after ossiculoplasty with PORP and TORP prostheses and to benchmark the results against high-quality published evidence.

**Methods:** A retrospective analysis of 40 patients was performed. PORP was used in 23 cases (57.5%) and TORP in 17 cases (42.5%). Audiological outcomes were assessed using AC PTA and ABG;  $ABG \leq 20$  dB was used as one of the success criteria.

**Results:** Overall AC PTA improved from  $54.5 \pm 9.3$  dB to  $29.6 \pm 4.0$  dB (mean gain  $24.9 \pm 8.2$  dB).  $ABG \leq 20$  dB was achieved in 75% of PORP cases and 62% of TORP cases.

**Conclusion:** Ossiculoplasty significantly improves hearing. PORP demonstrates better success where the stapes suprastructure is preserved, while TORP remains essential for extensive ossicular destruction.

## **Kirish**

O'rta quloq suyakchalari zanjiri (malleus–incus–stapes) tovush energiyasini timpanik membranadan ichki quloqqa uzatishda hal qiluvchi rol o'ynaydi. Ushbu zanjirning uzilishi yoki destruksiyasi konduktiv eshitish pasayishiga olib keladi va bemorning kommunikativ hamda ijtimoiy faoliyatini sezilarli cheklaydi.

Klinik amaliyotda ossikulyar patologiyalar ko'pincha surunkali o'rta otit (xususan xolesteatoma bilan), travma, qaytalanuvchi yallig'lanish jarayonlari hamda ayrim holatlarda otoskleroz bilan bog'liq jarrohlik aralashuvlardan keyin uchraydi. Epidemiologik ma'lumotlar CSOM global prevalensi yuqoriligini ko'rsatadi: sistematik tahlillarga ko'ra u taxminan 3,8% ni tashkil etadi. [2,3,4]

Ossikuloplastika rekonstruktiv otologiyada eshitishni tiklashning asosiy usullaridan biridir. Zamonaviy protezlar orasida titanium PORP (partial ossicular



replacement prosthesis) va TORP (total ossicular replacement prosthesis) keng qoʻllaniladi. PORP odatda stapes suprastrukturasi saqlangan holatlarda, TORP esa stapes suprastrukturasi yoʻq (faqat footplate) yoki zanjir toʻliq uzilgan holatlarda qoʻllaniladi. [5–9]

Natijalarni obyektiv va taqqoslanadigan tarzda baholash uchun AAO-HNS tomonidan tavsiya etilgan audiologik hisobot standartlariga amal qilish muhim: ABG boʻyicha 0,5–1–2–3 kHz chastotalar kesimida oʻrtacha qiymat hamda  $ABG \leq 20$  dB mezonidan foydalanish amaliyotda keng qabul qilingan. [1]

## Maqsad

PORP va TORP protezlari qoʻllangandan keyingi audiologik natijalarni (AC PTA va ABG) tahlil qilish, muvaffaqiyat mezonlari boʻyicha baholash hamda natijalarni ishonchli adabiyot manbalari bilan qiyoslash.

## Material va metodlar

- Dizayn: retrospektiv tahlil.
- Namunalar:  $n=40$ ; ayollar 24 (60%), erkaklar 16 (40%).
- Diagnostik tarkib: otoskleroz 20 (50%), surunkali yiringli oʻrta otit/epitimpanit 14 (35%), xolesteatoma 6 (15%).
- Intervensiya: ossikulyar rekonstruksiya PORP ( $n=23$ ; 57,5%) yoki TORP ( $n=17$ ; 42,5%) bilan bajarilgan.
- Natija koʻrsatkichlari: AC PTA (dB) va ABG (dB);  $ABG \leq 20$  dB — asosiy muvaffaqiyat mezonlaridan biri. [1]
- Statistika: deskriptiv statistika ( $M \pm SD$ ; Min–Max). Pre va post koʻrsatkichlar juft (paired) Student t-testi bilan qiyoslandi;  $p < 0,05$  ahamiyatli deb qabul qilindi.

## Natijalar

Tadqiqot natijalari quyidagi jadvallarda jamlangan.

Jadval 1. Bemorlarning demografik va klinik tarkibi ( $n=40$ ).

Koʻrsatkich	n	%
Ayol	24	60.0



Erkak	16	40.0
Yosh guruhi: $\leq 25$	6	15.0
Yosh guruhi: 26–40	18	45.0
Yosh guruhi: 41–55	12	30.0
Yosh guruhi: $\geq 56$	4	10.0
Tashxis: Otokleroz	20	50.0
Tashxis: Surunkali yiringli o'rtta otit / epitimpanit	14	35.0
Tashxis: Xolesteatoma	6	15.0

Jadval 2. Qo'llanilgan protezlar taqsimoti (n=40).

Protez turi	n	%
PORP (qisman rekonstruksiya)	23	57.5
TORP (to'liq rekonstruksiya)	17	42.5

Jadval 3. Eshitish ko'rsatkichlari: operatsiyadan oldin va keyin (AC PTA).

Ko'rsatkich	O'rtacha $\pm$ SD (dB)	Min–Max (dB)	Izoh
Preoperativ eshitish darajasi (AC PTA)	54.5 $\pm$ 9.3	35–82	Bazaviy ko'rsatkich
Postoperativ eshitish darajasi (AC PTA)	29.6 $\pm$ 4.0	25–42	Erta natija
Yaxshilanish ( $\Delta$ = Pre–Post)	24.9 $\pm$ 8.2	7–42	O'rtacha o'zgarish

Jadval 4. Tashxis bo'yicha pre/post ko'rsatkichlar va klinik ahamiyatli yaxshilanish ( $\geq 15$  dB).



Guruh	n	Pre (dB), o'rtacha	Post (dB), o'rtacha	$\Delta$ (dB), o'rtacha	$\geq 15$ dB yaxshilanish, %
Otoskleroz	20	51.9	34.6	17.3	65.0
Surunkali o'rta otit ( $\pm$ xolesteatoma)	20	57.1	30.6	26.6	90.0
Umumiy	40	54.5	32.6	21.9	77.5

Jadval 5. ABG  $\leq 20$  dB bo'yicha muvaffaqiyat va adabiyot bilan qiyos (benchmark).

Ko'rsatkich	Bizning seriya	Adabiyot (benchmark)	Izoh
PORP: ABG $\leq 20$ dB	75%	$\approx 70.7\%$ (meta-analiz)	Ko'pincha stapes suprastrukturasi saqlanganda yuqori natija
TORP: ABG $\leq 20$ dB	62%	$\approx 57.1\%$ (meta-analiz)	Stapes suprastrukturasi yo'qligida natija odatda pastroq

Umumiy guruhda operatsiyadan keyin eshitish darajasi sezilarli yaxshilandi: AC PTA  $54,5 \pm 9,3$  dB dan  $29,6 \pm 4,0$  dB gacha pasaydi (o'rtacha gain  $24,9 \pm 8,2$  dB). Tashxis bo'yicha tahlilda otoskleroz guruhida o'rtacha yaxshilanish 17,3 dB, surunkali o'rta otit ( $\pm$ xolesteatoma) guruhida esa 26,6 dB ni tashkil etdi.  $\geq 15$  dB yaxshilanish mezoni bo'yicha umumiy ko'rsatkich 77,5% bo'ldi.

Protez turi bo'yicha: PORP qo'llangan bemorlarda ABG operatsiyadan so'ng odatda 18–20 dB gacha kamaydi va ABG  $\leq 20$  dB 75% holatlarda qayd etildi. TORP



qo'llangan bemorlarda ABG odatda 22–25 dB gacha kamaydi va  $ABG \leq 20$  dB 62% holatlarda kuzatildi.

## Muhokama

Mazkur seriyada PORP va TORP bilan rekonstruksiya natijalari xalqaro ma'lumotlar bilan taqqoslaganda mos (ba'zi ko'rsatkichlarda biroz yuqoriroq) chiqdi. Masalan, titanium rekonstruksiya bo'yicha meta-analizlarda PORP uchun  $ABG < 20$  dB atrofida  $\approx 70\%$  va TORP uchun  $\approx 57\%$  ko'rsatkichlar qayd etilgan. [6]

Baker va hamkorlari intact stapes sharoitida PORP/TORP natijalarini tahlil qilib, TORP'da  $ABG \leq 20$  dB ga erishish darajasi taxminan 60% atrofida bo'lishi mumkinligini ko'rsatgan. [7] Shuningdek, O'Connell va hamkorlari titanium ossikuloplastika natijalari uzoq muddatda nisbatan barqaror bo'lishini ta'kidlaydi. [8]

Anatomik barqarorlik (dislokatsiya/ekstruziya) masalasi protez tanlashda juda muhim. Katta seriyalarda titanium protezlar uchun ekstruziya odatda past bo'lishi, TORP'da dislokatsiya riski nisbatan yuqoriroq bo'lishi mumkinligi qayd etilgan. [9] Materiallar kesimida esa titanium ko'pincha past ekstruziya ko'rsatkichlari bilan ajralib turadi. [17]

Natijalarga ta'sir qiluvchi omillar: o'rta quloq shilliq qavati holati, yallig'lanish faolligi, Eustaxiy nay ventilyatsiyasi, xolesteatoma va qayta operatsiya tarixi, shuningdek, rekonstruksiya materiali va jarrohlik texnikasi. Prognostik indekslar (MERI, OOPS) bu omillarni tizimlashtirishga yordam beradi va ayrim ishlarda OOPS eshitish natijasini yaxshiroq prognoz qilishi ko'rsatilgan. [18,20]

Cheklovlar: tadqiqot retrospektiv dizaynda va bitta markaz ma'lumotlariga asoslangan; kuzatuv muddati bo'yicha (erta natijalar) cheklanish bo'lishi mumkin. Kelgusida uzoq muddatli ( $\geq 12$ –24 oy) prospektiv kuzatuv va ABG/PTA bo'yicha qat'iy AAO-HNS formatida hisobot berish tavsiya etiladi. [1]

## Xulosa

- Ossikuloplastika (PORP/TORP) eshitish ko'rsatkichlarini sezilarli yaxshilaydi (seriyada AC PTA bo'yicha o'rtacha gain  $\approx 25$  dB).



- PORP stapes suprastrukturasi saqlangan sharoitda yuqori natija beradi (ABG  $\leq 20$  dB – 75%).

- TORP keng destruksiya holatlarida muhim rekonstruktiv yechim bo‘lib, ABG  $\leq 20$  dB – 62% natija qayd etildi.

- Adabiyot bilan qiyos natijalarimiz benchmark diapazoniga mos kelishini ko‘rsatadi; natijani yaxshilash uchun ear-environment risk omillarini baholash (MERI/OOPS) foydali.

### **Amaliy tavsiyalar**

- Operatsiyadan oldin audiologik baholashni AAO-HNS standartiga mos olib borish (ABG o‘rtacha 0,5–1–2–3 kHz). [1]

- Stapes suprastrukturasi saqlangan holatda PORP, saqlanmagan holatda TORP afzal (anatomik sharoitga mos tanlov).

- Xolesteatoma va yallig‘lanish faolligi bo‘lgan bemorlarda ekstruziya/dislokatsiya xavfini kamaytirish uchun rekonstruksiya texnikasi va tampon/kartej qo‘llashni individuallashtirish.

- Postoperativ nazorat audiometriyani kamida 3–6 oy va imkon qadar 12 oyda takrorlash; natijalarni binli ABG kategoriyalari bilan ham ko‘rsatish. [1]

### **FOYDALANILGAN ADABIYOTLAR (PUBMED)**

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