THE EFFICIENCY OF PROSTHESIS WITH EXTENSIBLE (ADJUSTABLE) STEM IN OSSICULAR CHAIN RECONSTRUCTION: OUR EXPERIENCE

To analyze the effectiveness of surgical treatment with ossiculoplasty of patients with chronic suppurative otitis media and congenital ear malformations operated in a single clinical center from 2016 to date with the use of different types of ossicular prosthesis
723 patients (921 operation) with chronic suppurative otitis media and congenital ear malformations underwent tympanoplasty with ossiculoplasty. We used partial titanium ossicular prosthesis in 612 cases and total titanium ossicular prosthesis in 309 cases.
Materials and methods

In 252 cases patients underwent 1 to 5 tympanoplasty in different hospital earlier.
We used prosthesis with extensible (adjustable) stem (the stem is extensible and compressable to set the perfect length). The prosthesis showed good sound wave conductivity by oscillometric tests (unchanged conductivity of the sound wave in all stem configurations).
TITANIUM / HAP (hydroxyapatite) Adjustable prosthesis

- No cartilage interposition needed: The HAP flange can be placed directly in touch with the tympanum
- Implant stability: The flange sticks to the tympanum thanks to its porosity
- Saves stock! One model fixes all lengths
- Adjustable stem that can be tried in place till the perfect length is reached
- Can be extended and compressed several times
- No additional and expensive instruments needed
The effectiveness of the surgical interventions were assessed as short-term (up to 3 months post-operatively) and long-term (6 to 12 months) anatomical and functional outcomes. The anatomical results considered satisfactory if there was a well-formed mobile neotympanic membrane, air tympanic cavity and dry postoperative cavity. Pure tone audiograms were used to evaluate the functional results.
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Results

Satisfactory anatomical results were obtained in 93.5% of the patients with the safe type suppurative otitis, in 88.9% of patients with the unsafe type and in 91.2% of the patients after a revision surgery. The average air conduction was 33.7 ± 7.1 dB before surgery and significantly decreased to 17.5 ± 5.8 dB at 6 months postoperatively in patients who underwent ossiculoplasty using a partial ossicular prosthesis with satisfactory anatomic results. Analysis of the functional results showed a statistically significant (p < 0.05) decrease average air conduction to 35.5 ± 5.7 dB (before surgery 57.1 ± 5.3 dB) and air-bone gap to 18.5 ± 2.3 dB (before surgery 36.5 dB) in 91.4% of cases in patients who underwent ossiculoplasty with a total prosthesis with satisfactory anatomical results.
Results

4 mon after retympanoplasty
Results

2 mon after tympanoplasty
Results

4 mon after tympanoplasty
Results

3 mon after second CWDM
Results

12 mon after CWDM
Results

2 week after second CWDM
Results

3 mon after second CWDM
Results

6 mon after CWDM
Clinical case. Infralabyrinthine cholesteatoma
Clinical case. Infralabyrinthine-apical cholesteatoma
Displacement of total ossicular prostheses was registered in 9 (2.9%) cases from 309.

The most common causes of unsatisfactory anatomical results were perforation (15 cases), cholesteatoma reocurrence (3 cases) and lateralization of the neotympanic membrane (3 cases).
Formation of a reliable sound conducting system with ossicular prostheses allows for persistent improvement of hearing. Various surgical techniques, such as extended posterior tympanotomy, endoscopic assistance, provide a good effect with the removal of non-aggressive cholesteatoma while preserving the bone structures, which are not involved in the disease. A complete removal of an advanced aggressive cholesteatoma with the opening of the temporal bone cell system ensures good functional and anatomical outcomes, makes it possible to prevent the spread of the pathological process and development of intracranial complications.
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