

Assessment of functional surgery in case of chronic otitis media

Ocena chirurgii funkcjonalnej
w zapaleniu ucha środkowego

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ABSTRACT

INTRODUCTION

Among the many factors which influence the postoperative condition of an ear, the problems of retraction processes and impaired ventilation of the middle ear cavity seem to be extremely important. The aims of the study were to present a surgical technique for the prevention of retractions and tympanosclerosis as well as to evaluate the effectiveness of pharyngeal muscle kinesiotherapy.

MATERIAL AND METHODS

The study included 34 patients (21 women and 13 men) who were treated in the otolaryngology department of Grodno City Hospital during the period from 2010 to 2012. The mean age was 31.3 ± 3.3 . All the patients were treated for chronic atticotympanic otitis. The examination included an evaluation of speech, otomicroscopy, audiometry, tympanometry, impedance audiometry, as well as acumetry. All the patients underwent reconstructive surgery of the middle ear and comprehensive kinesiotherapy consisting of 10 exercises.

RESULTS

Positive clinical and morphological results depended on the scope of reconstruction. The number of patients with adequate social hearing after atticotomy with closed tympanoplasty increased from 40% to 69% and after open tympanoplasty, it increased from 22.2% to 61.5%. Tympanogramme analysis revealed a larger increase in P, G, C indicators after carrying out comprehensive kinesiotherapy exercises repeatedly: P of 24, G of 0.014 and C of 0.05.

CONCLUSION

During reconstructive surgery of the middle ear, it is necessary to focus on the structure of the neotympanic cavity walls to create an adequate aeriferous system. In the postoperative period, measurements assessing middle ear ventilation behaviour are necessary. Comprehensive throat muscle kinesiotherapy is a simple and easily accessible method, which can be performed by the patient under supervision of an otolaryngologist.

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KEY WORDS

attic, cartilaginous plate, chronic purulent otitis media, bone chips, kinesiotherapy method of pharyngeal muscles

STRESZCZENIE

WSTĘP

Spośród licznych czynników wpływających na stan pooperacyjny ucha niezwykle istotny wydaje się problem kieszonek retrakcyjnych i upośledzonej wentylacji ucha środkowego. Celem badania było przedstawienie metody chirurgicznej, która zapobiegałaby retrakcjom i tympanosklerozie, oraz ocena skuteczności kinezyterapii mięśni gardłowych.

MATERIAŁ I METODY

Badaniem objęto 34 pacjentów (21 kobiet i 13 mężczyzn) leczonych w Klinice Laryngologii Szpitala Miejskiego w Grodnie w latach 2010–2012. Średnia wieku wyniosła $31,3 \pm 3,3$ roku. Wszyscy pacjenci leczeni byli z powodu przewlekłego attykoantralnego zapalenia ucha środkowego. Badanie obejmowało ocenę mowy, badanie otoskopowe w mikroskopie, audiometrię, tympanometrię, audiometrię impedancyjną, akumetrię. Wszyscy pacjenci byli poddani operacji rekonstrukcyjnej ucha środkowego oraz kompleksowej kinezyterapii, składającej się z 10 ćwiczeń.

WYNIKI

Pozytywne kliniczne i morfologiczne wyniki zależały od zakresu rekonstrukcji. Liczba pacjentów z odpowiednim socjalnie wydolnym słyszeniem, poddanych zabiegowi attykoantrotomii z zamkniętą tympanoplastyką, wzrosła z 40% do 69%, a po otwartej tympanoplastyce z 22,2% do 61,5%. Kontrola tympanogramów wykazała wyższy wzrost wskaźników P, G, C po kompleksowych ćwiczeniach kinezyterapeutycznych z powtarzalnym P dla 24, G dla 0,014 oraz C dla 0,15.

WNIOSKI

Przy operacjach rekonstrukcyjnych ucha środkowego niezwykle istotne jest, aby zwrócić uwagę na strukturę jamy neotympanalnej dla wytworzenia odpowiedniego systemu powietrznego. W okresie pooperacyjnym niezbędne są pomiary oceniające zachowanie wentylacji ucha środkowego. Kompleksowa kinezyterapia mięśni gardła jest prostym i łatwo dostępnym sposobem, który może być stosowany przez pacjenta pod nadzorem lekarza laryngologa.

SŁOWA KLUCZOWE

płytkę chrzęstną, fragmenty kostne, ucho środkowe – chroniczne zapalenie, kinezyterapia mięśni gardłowych

INTRODUCTION

Among the types of ENT diseases 44–50% are diseases of the middle ear. A special place is occupied by chronic purulent otitis media. According to statistical data, the number of patients with chronic purulent otitis media is not decreasing. Most people suffering from this disease are in the working-age population.

Dysfunction of the auditory tube is the source of many diseases of the middle ear. Violations of ventilation of the middle ear result in a change of the gaseous medium in it that disrupts the process of gas exchange in the mucosa [1,2].

The problem of reconstructing neotympanic cavity walls has not been solved yet and it continues to be discussed among surgeons in the field of otorhinolaryngology. Different variants of operations with the use of a complete cartilaginous plate (Wullstein, P.C. Weber, B.J. Gans, O.K. Patjakina), cartilaginous transplant of the auricle (S. Bacciu, S. Yetiser, T. Puls, I.T. Muhamedov), bone plate (V. P. Nechiporenko, etc.) have some drawbacks [3,4,5,6,7,8,9,10,11,12].

Among the range different factors which influence the postoperative condition of an ear, there are the problems of retraction processes and middle ear cavity ventilation disorders [5,10,12].

PURPOSE. 1) to present a surgical technique for the prevention of retractions and tympanosclerosis; 2) to

evaluate the effectiveness of pharyngeal muscle kinesiotherapy.

MATERIAL AND METHODS

The study included 34 patients (21 women and 13 men) who were treated in the otolaryngology department of Grodno City Hospital during the period from 2010 to 2012. The mean age was 31.3 ± 3.3 . All the patients were treated for chronic atticoantral otitis. The examination included an evaluation of speech, otomicroscopy, audiometry, tympanometry, impedance audiometry, as well as acumetry. All the patients have underwent reconstructive surgery on the middle ear. During the operation we performed restoration of the neotympanic cavity walls in all the patients, using our method of treatment. The patients underwent comprehensive kinesiotherapy, consisting of 10 exercises.

RESULTS

It was established that the patients had various degrees of impaired auditory tube ventilation [1,3], reduced audibility of whispered speech, changes in the performance of camertonal tests, as well as the presence of a bony-air interval in the audiogram. During the operation the lateral wall of the attic was removed at the stage of sanitation for the purpose of tympanic cavity inspection.

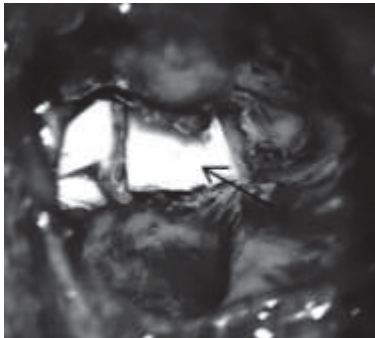


Fig. 1 Neotympanic cavity, arrow indicates cartilaginous plate with notches.
Ryc. 1. Widoczna jama neotympanalna, strzałki wskazują płytkę chrzęstną z nacięciami.

We performed prevention of ventilation disorders in the middle ear during the operation. We used a double layer graft consisting of cartilage and fascia (or perihondrium) to reconstruct the tympanic membrane (Fig. 1, 2, 4). At the final stage of the operation we proposed and used a cartilaginous plate with notches and bone chips to reconstruct the neotympanic cavity walls (Fig. 3). The cartilaginous plate consisted of

mobile fragments. We carefully formed the front corner. We formed a ventilation path in the middle ear to all the spaces.

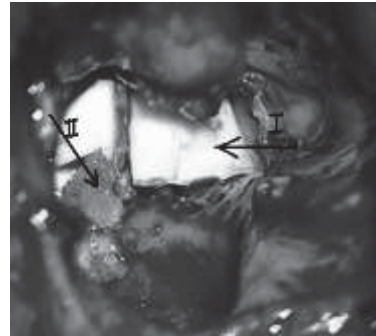


Fig. 2. Cartilaginous plate (I) and bone chips (II) used to reconstruct neotympanic cavity walls.
Ryc. 2. Widoczna płytkę chrzęstną (I) oraz fragment kostny (II) do rekonstrukcji ścian jamy neotympanalnej.

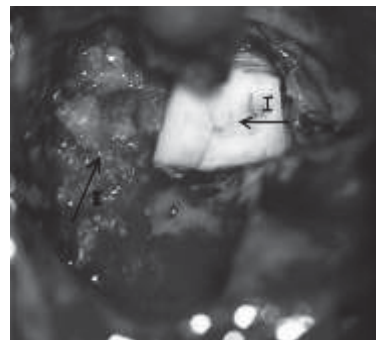


Fig. 3. Cartilaginous plate (I) and bone chips (II) used to reconstruct neotympanic cavity's walls.
Ryc. 3. Widoczna płytkę chrzęstną (I) oraz fragment kostny (II) do rekonstrukcji ścian jamy neotympanalnej.

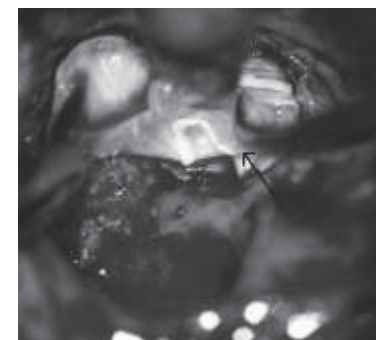


Fig. 4. Arrow indicates patient's temporal muscle fascia during operation.
Ryc. 4. Powięź mięśnia skroniowego pacjenta w trakcie operacji.

The patients carried out pharyngeal muscle kinesiotherapy in the postoperative period to prevent and eliminate dysfunction of the Eustachian tube. Kinesio-

therapy is a set of special exercises for training of the pharyngeal muscles which helps to improve the ventilation function of the Eustachian tube.

We recommend a kinesiotherapy method consisting of 10 exercises which a patient must do 3 times a day (Fig. 5–8). Each exercise must be done 10 times. The length of the cycle is 21 days. After a 14-day break, the cycle must be repeated. The course of treatment is 3 months. Then the exercises may be done for prevention. One month after the operation we received the following results: neotympanic membrane of a pink color, whole, moist; pathological discharge was absent in the external acoustic meatus, retraction in the area of the attic was absent as well. Two months after the operation, we repeatedly performed audiometry, tympanometry and otomicroscopy on all the patients. We obtained the following results: neotympanic membrane of a grey-pink color, equal, whole; retraction in the area of the attic and back wall of the external acoustic meatus was absent, pathological discharge was absent in the external acoustic meatus, a reduction in the bony-air interval is indicated at 10–25 dB in the pure tone audiometry; type B is located on the tympanogram.



Fig. 5. Patient abuts chin and holding it in the hand, moves lower jaw back and forth with effort. (hand creates resistance).

Ryc. 5. Pacjent wysuwa brodę i obejmując ją dłonią wykonuje ruchy żuchwą w przód i w tył z wysiłkiem (ręka stawia opór).



Fig. 6. Patient inhales through nose, closes it with 2 fingers, and exhales uttering voiced sounds [m, n].

Ryc. 6. Pacjent wykonuje wdech przez nos, zatyka nos dwoma palcami i na wydechu wypowiada dźwięczne głoski (m, n).



Fig. 7. Swallowing water in small portions.

Ryc. 7. Popijanie wody małymi łykami.



Fig. 8. A patient closes mouth, and places end of tongue against upper incisors and performs swallowing movements.

Ryc. 8. Pacjent zamyka usta, ustawia koniec języka na górnych siekaczach i wykonuje ruchy polykania.

One year after the operation: positive clinical and morphological results depended on the scope of reconstruction. The number of patients with adequate social hearing after atticoantrotomy with closed tympanoplasty increased from 40% to 69%, after open tympanoplasty, it increased from 22.2% to 61.5%. Tympanogramme analysis established a larger increase in P, G, C indicators after carrying out comprehensive kinesiotherapy exercises repeatedly: P of 24, G of 0.014, C of 0.05.

CONCLUSION

During reconstruction of the middle ear, it is necessary to focus on the structure of the neotympanic cavity walls to create an adequate aeriferous system. In the postoperative period, measures to maintain ventilation of the middle ear are needed. Comprehensive throat muscle kinesiotherapy is a simple and available method, which can be performed by the patient under supervision of an otolaryngologist.

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