Management Algorithm for Tympanic Membrane Retraction Pockets
A New Concept for Treatment

ESSAM FATHY, M.D.*; WAEL A. AL-ZAMIL, M.D.* and SAID ABD EL-MONEN, M.D.**
The Department of Otorhinolaryngology, Hearing & Speech Institute, General Organization for Teaching Hospitals & Institutes, Cairo* and The Department of Otorhinolaryngology, Head & Neck Surgery, Zagazig University, Zagazig**

Abstract

Background: The treatment of retraction pockets of tympanic membrane, whether surgical or non-surgical, is highly variable amongst otologists. It was recognized that producing a guideline on any surgical condition based on high level of evidence is difficult. Management decisions and procedures used in the treatment of retraction pockets depends on the functional and anatomic condition of the ear, but still continue to be debatable with multiple controversies.

Aim of the Work: The purpose of this study is to construct a management algorithm for retraction pockets.

Material and Methods: 75 ears of 68 patients had been followed-up since March 2008 till April 2015. 52 children and 16 adults with ages ranging from 7 to 53 years were included in the study. Watchful waiting was performed in 12 ears, T-tube insertion in 18 ears and cartilage tympanoplasty with other surgical details were done in 46 ears.

Results: Watchful waiting in 12 ears showed stationary pathology in 9 patients throughout the study period, with 3 patients suffered progression of the pocket for which T-tube insertion was done. Observations revealed stationary pathology on watchful waiting in 75%, and 33.3% of cases after T-tube insertion which improved to 71.4% after reinsertion of tubes, and 85.7-100% of patients after cartilage tympanoplasty and other surgical procedures for different types of pockets. Further follow-up revealed that, in a substantial number of T-tube patients the disorder tended to recur and required further interventions. The results after cartilage tympanoplasty were most stable.

Conclusion: Management of retraction pockets should be tailored individually for every patient depending on precise grading of the pocket and compulsory regular follow-up to pick up any progression and to put the patient in his proper level of management inside the management scale.

Key Words: Retraction pocket – Preventive ear surgery – Pocket algorithm – Cartilage tympanoplasty.

Introduction

IN our study we aimed to construct a management algorithm for retraction pockets.

The retraction pocket of tympanic membrane is a pathological invagination of tympanic membrane into the middle ear space. It is usually regarded to be a sequel of chronic otitis media with effusion [1].

Prolonged dysfunction of the eustachian tube and excessive negative pressure in the middle ear may lead to atrophic changes in the middle, fibrous layer of tympanic membrane and to development of localized or generalized tympanic membrane atelectasis. The most common sites of retraction pocket are pars flaccid and postero-superior parts of tympanic membrane. Progression of the retraction causes the atrophic membrane to drape over the incus and stapes, often resulting in necrosis of these ossicles. Over time retraction pocket tends to form adhesions with the surrounding structures, which make changes irreversible. Another problem is that some of deep retraction pocket loss ability to self cleaning and starts to accumulate debris and epithelium which are prone to infections. Infected pocket with debris and granulation tissue may be regarded as pre-cholesteatoma [2].

Some of retraction pocket will regress spontaneously, some will remain stable, and some will proceed and will lead to cholesteatoma formation. Apart from eustachian tube dysfunction there were also some suggestion that the process is due to the presence of fluid and inflammatory process in the middle ear followed by activation of collagenase and other enzymes in tympanic membrane which causes breakdown of its fibrous layers [3].

The difficulties in decision making about surgical treatment of retraction pocket are related also
to the fact that both at early and in advanced stages the symptoms can be rather minimal, and hearing even after destruction of the long process of incus may remain almost normal. The decision about aggressive surgical treatment is not a problem in a patient with significant conductive hearing loss, but it is especially difficult in patient with normal hearing. This kind of surgery is called preventive tympanoplasty [4].

However controversies arise with claims that early intervention in the ear with not significant destruction is technically much easier to perform. However there is always a risk of hearing deterioration and other complication in the ear with minor pathology which could possibly stabilize it the future without intervention. On the other hand “wait and see policy” may lead to extent adhesions in the middle ear which will cause difficult surgery and possibly negatively influence final result of the treatment [5].

If there is rapid progression over time, such retraction pocket obviously should to be treated in order to prevent progression to more advanced stages. If retraction pocket is accompanied by chronic middle ear effusion it can be regarded as a proof of an active process in the middle ear. Long lasting fluid together with negative tympanic cavity pressure causes secondary changes of tympanic membrane. Such a case should be treated without any delay the evolution of retraction pocket to secondary acquired cholesteatoma is a well proved phenomenon [6].

However some controversy exists about the borderline between deep uncontrollable and non reversible retraction pocket and cholesteatoma. It seems to be logical that if retraction pocket is filled with debris and cerumen (precholesteatoma) it means that self cleaning properties of tympanic membrane are lacking in that case and the decision about surgery should be quicker. If retraction pocket is filled with debris, infected and perforated, it is already a cholesteatoma.

A treatment technique has been described first by Marquet in 1996-after insertion of ventilating tube he advised progressive suction of the atelectatic tympanic membrane to convert the retraction pocket into lateral epithelial sac, and then cutting of the everted retraction pocket. According to his description in less than 8 days the tympanic membrane regains normal appearance [7].

It is reasonable not to excise to large areas of tympanic membrane since large perforation may persist. Excision should better be done if retraction is limited to one quadrant. Pars flacida retraction pocket are not excised since there is a risk of in growth of squamous epithelium and cholesteatoma formation at that area [8].

The current study aimed at constructing a management algorithm for retraction pockets.

**Material and Methods**

This study was conducted between March 2008 and April 2015 in Hearing and Speech Institute, Cairo and Zagazig University Hospitals. The study protocol was approved by the institutional ethical review committee. Informed consent was obtained from the patients or parents.

This is retrospective study was conducted on 68 patients (75 ears) with type 1, type 2 and type 3 retraction pockets. Patients were 52 children and 16 adults with their ages varied from 7 to 53 years. With mean 14.4±11.2. Follow-up from 3 to 6yrs. (Mean 5.1±3.9).

Each patient with retraction pocket was subjected to thorough examination of nose and nasopharynx to exclude or manage adenoid hypertrophy. Allergy should be excluded/or treated. The ear should be thoroughly cleaned of cerumen and debris, since retraction pocket is often hidden behind them. Microscopic examination of each affected ear for staging, drawing and documentation [9]. If the bottom of retraction pocket cannot be seen, otoendoscopy with angled Hopkins lens is useful.

Pneumatic otoscopy to verify whether pocket is reversible (movable or fixated). Patient was also asked to perform valsalva maneuver to inflate middle ear while otoscopy, audiometry was done to determine air bone gap which if significant should be considered for treatment. Hearing results were estimated by pre-and postoperative air bone gap taken in 2008, 2011 and 2014. Air bone gap was established as pure tone average at the frequencies of 0.5/1.0/2.0 and 3.0kHz. The air bone gap is the four pure tone averages for air conduction minus four pure tone averages for bone conduction.

Tympanometry was also done to establish whether retraction pocket is accompanied by middle ear effusion, eustachian dysfunction or compartmentation in case of retraction pocket with type atyppanometry.

Computed Tomography scanning (CT) of the temporal bone was performed especially in deep
(type 3) retraction pocket where the bottom cannot be seen.

The pre-management assessment should focus on three main parameters which will determine the management strategy.

1. The type or grade of the retraction pocket. A number of different classifications with the best known are that of Sade (Table 1), Tos and Charachon [10,11] depending on whether it is possible to see with the microscope the extent of retraction pocket and to evaluate whether there is no debris at the bottom. Depending on whether it is possible to see all parts of the pocket or not it is called controllable or uncontrollable retraction pocket. Other important feature is whether the retraction pocket is fixed or not. Those which are adhered to the middle ear structures but cannot be reversed are called fixed. The one which adheres to the ossicles and promontory but can be reversed is called not fixed. So retraction pocket can be classified according to Charachon grading system (Charachon stages) I to III Fig. (1).

   Type I, controllable, not fixed (mobile retraction pocket fully visible under microscope).

   Type II, controllable, fixed (non mobile retraction pocket fully visible under microscope).

   Type III, uncontrollable, fixed (non mobile retraction pocket with the deepest part of the pocket invisible under microscope).

Józef and Andrew [12] have applied modification to the Charachon system to determine whether retraction pocket is located in pars tensa, or pars flacida of tympanic membrane by adding letters F in cases where flacid part of tympanic membrane is involved, or letter T in cases where tense part is involved. Taking all the features we can address any kind of retraction pocket as for ex: F 1 (flaccid part controllable, not fixed retraction pocket), or T3 (tens part uncontrollable, fixed retraction pocket).

2. The functional status of the affected ear as regards hearing.

   3. The behavior of retraction pocket over a time whether regressive pocket improving with medical treatment, oto-inflation or tube insertion, or stationary pocket or progressive pocket regarding its depth and other sequel (bone or ossicular erosion, discharge or keratin accumulation).

So, the decision about surgery or other management modality should be prompted according to a pocket type, disturbed function and finally a pocket behavior for example, when retraction pocket is not self cleaning and debris and epithelium are found inside (risk of cholesteatoma).

Management Algorithm (Table 2).

Type T1: (Controllable, not fixed) retraction pocket in pars tensa affecting 12 ears in 10 patients, watchful waiting or wait and see policy provided that there was no hearing loss exceeding social communication problems (10dB ABG), and that there was no chronic middle ear effusion. Systematic follow-up of the patient with assessment of progression of the disease over time. We have checked patients every three months, with photo documentation, or exact anatomic notes/drawings for better comparison. Each patient was advised to use auto inflation training. If after three months no progression is observed patients followed-up every three months, for two years. If progression of retraction pocket is noted, or if there is a significant hearing loss, and/or OME, the patient is submitted to tympanostomy tube placement. Actually progression has occurred in three ears of three patients for which tympanostomy tubes were done. Tow of which had a recurrence, reinsertion of T-tube were done.

Type T2: (Controllable, fixed) retraction pocket affecting pars tensa, affecting 18 ears in 16 patients having no hearing loss, middle ear fluid, we performed T-tube insertion for them. Regular follow-up and documentation revealed stationary pathology in 6 ears only of 6 patients, with progression of pathology in the remaining 12 ears of 10 patients beside two cases from the previous group who undergone T-tube insertion. The progression was actually a recurrence of retraction after tube extrusion presenting with progressive hearing loss in 10 ears of 8 patients plus ear discharge in 4 ears of 4 patients. We have performed reinsertion of T-tube to the recurrent cases except one patient preferred cartilage tympanoplasty as an option. For the discharging ears, cartilage tympanoplasty was done as a baseline procedure [13], in addition to cortical mastoidectomy, modified radical mastoidectomy, and posterior tympanotomy procedures according to intraoperative findings.

Type T3: (Incontrollable, fixed retraction pocket) in pars tensa affecting 21 ears 20 patients, we have done canal wall down modified radical mastoidectomy and ossiculoplasty mainly by incus remodelling and interposition in 18 affected ears. Also we have performed canal wall up cortical mastoidectomy with posterior tympanotomy in three affected ears. Surgery should be performed in order to pre-
vent cholesteatoma formation. The retraction pocket was separated, elevated, and supported with cartilage graft. Posterior tympanotomy is important for elevation of retraction pocket from posterior part of tympanic cavity (facial recess, incudostapedial-joint). If retraction pocket is ruptured during surgery, second look surgery should be planned in the future to exclude residual cholesteatoma (fortunately not happened).

Type F1 (controllable, not fixed), affecting pars flacida in 3 ears of 3 patients and type F2 (controllable, fixed) affecting pars flacida in 9 ears of 7 patients, we have elevated or excised the atelectatic membrane and performed scutum reconstruction by tragal cartilage [14]. We notice that no place for wait and see policy in F types, the reason is that the flaccid part of tympanic membrane has no fibrous layer, so the retraction pocket development is quicker, followed by quick bone absorption, and faster formation of cholesteatoma. In these cases the management should be more aggressive. Type F3: (Incontrollable, fixed retraction pocket) in pars flacida affecting 12 ears in 12 patients, we have performed retrograde atticotomy in 3 patients, retrograde atticoantrostomy and modified radical mastoidectomy in 7 patients and posterior atticotomy with cortical mastoidectomy in 2 patients.

Number and percentage of ears and patients and type of retraction pockets treated are shown in (Table 3).

### Statistical analysis:
Audiological results are expressed as mean ± SD. Paired t-tests was used to compare mean values of audiological results before and after management.

### Table (1): Classification proposed by Sade.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Retracted ear</td>
<td>Slight retraction of ear drum</td>
</tr>
<tr>
<td>2</td>
<td>Severe retraction</td>
<td>Retracted drum touching the incus or stapes</td>
</tr>
<tr>
<td>3</td>
<td>Atelectasis</td>
<td>Tympanic membrane touching the promontory</td>
</tr>
<tr>
<td>4</td>
<td>Adhesive otitis</td>
<td>Tympanic membrane adherent to the promontory</td>
</tr>
</tbody>
</table>

### Table (2): Overview of management algorithm of Retraction Pocket (RP).

<table>
<thead>
<tr>
<th>Type of retraction pocket</th>
<th>Management level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type T1</td>
<td>• Watchful waiting with close regular follow-up.</td>
</tr>
<tr>
<td>Type T2</td>
<td>• T-tube insertion and re insertion.</td>
</tr>
<tr>
<td>Type T3</td>
<td>• Modified radical mastoidectomy and ossiculoplasty or cortical mastoidectomy with posterior tympanotomy.</td>
</tr>
<tr>
<td>Type F1</td>
<td>• Elevation or excision of the atelectatic membrane and scutum reconstruction by tragal cartilage.</td>
</tr>
<tr>
<td>Type F2</td>
<td>• Retrograde atticotomy, retrograde atticoantrostomy, modified radical mastoidectomy, and posterior atticotomy with cortical mastoidectomy.</td>
</tr>
</tbody>
</table>

### Table (3): Number and percentage of ears and patients and type of retraction pockets treated.

<table>
<thead>
<tr>
<th>Type of R.P.</th>
<th>T1 (16%)</th>
<th>T2 (24%)</th>
<th>T3 (28%)</th>
<th>F1 (4%)</th>
<th>F2 (12%)</th>
<th>F3 (16%)</th>
<th>Total (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of ears</td>
<td>12</td>
<td>18</td>
<td>21</td>
<td>3</td>
<td>9</td>
<td>12</td>
<td>75</td>
</tr>
<tr>
<td>Number of patients</td>
<td>10</td>
<td>16</td>
<td>20</td>
<td>3</td>
<td>7</td>
<td>12</td>
<td>68</td>
</tr>
</tbody>
</table>

### Results

**Audiological data pre and post management:**
Average Air Bone Gap (ABG) at 0.5, 1.0, 2.0 and 3.0kHz for different types of pockets are presented in (Table 4) and results of long-term observation made are presented in (Table 4).

**Watchful waiting in 12 ears of Type T1:** (Controllable, not fixed) retraction pocket in pars tensa affecting 12 ears in 10 patients, premanagement audiogram did not exceeded 10dB ABG. Audiological data through the study period are presented in (Table 4). The air bone gap did not change significantly between 2008 and 2015 in our patients (p=0.17). Since in this group there were no ossicular pathology hearing status was moderated mostly by presence or absence of fluid. During our study,
there was no progression in this group (12 affected ears) except 3 ears, in 3 patients who suffered progression of their pathology after 6-18 months follow-up in the form of effusion in one patient and progression to type T2 in other two patients. The three patients were submitted to tympanostomy T-tube placement. After 12-18 months two of the T-tube patients have showed further progression of their pathology. The progression was in the form of progressive hearing loss in 1 ear and ear discharge in the other ear. We have performed cartilage tympanoplasty for them as a baseline procedure plus ossiculoplasty in the ear of hearing loss and modified radical mastoidectomy in the discharging ear. So success rate in long-term observation (number of ears and percentage) was 9 ears from 12 ears 75% showed no progression after watchful waiting.

Table (4): Audiological data pre and post management (2011 and 2014). ABG-average air bone gap 0.5/1.0/2.0/3.0kHz for different types of pockets.

<table>
<thead>
<tr>
<th>Audiologic data</th>
<th>T1 (N=12)</th>
<th>T2 (N=18)</th>
<th>T3 (N=21)</th>
<th>F1 (N=3)</th>
<th>F2 (N=9)</th>
<th>F3 (N=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premanagment ABG (dB)</td>
<td>7.7±4.1</td>
<td>21.2±7.1</td>
<td>34.6±9.9</td>
<td>5.4±3.1</td>
<td>13.5±5.5</td>
<td>18.6±7.1</td>
</tr>
<tr>
<td>Postop ABG 2008</td>
<td>7.9±4.2</td>
<td>13.3±7.2</td>
<td>16.2±5.9</td>
<td>5.2±2.9</td>
<td>7.3±4.1</td>
<td>15.2±6.2</td>
</tr>
<tr>
<td>Change in ABG</td>
<td>.2</td>
<td>−7.9</td>
<td>−18.4</td>
<td>−2</td>
<td>−8</td>
<td>−3.4</td>
</tr>
<tr>
<td>Postop ABG 20014</td>
<td>8.2±4.6</td>
<td>15.7±10.1</td>
<td>19.8±6.5</td>
<td>5.8±3.2</td>
<td>7.8±4.2</td>
<td>18±6.9</td>
</tr>
<tr>
<td>Change in ABG</td>
<td>.3</td>
<td>2.4</td>
<td>1.4</td>
<td>6</td>
<td>.5</td>
<td>3.2</td>
</tr>
</tbody>
</table>

In Type T2: (Controllable, fixed) retraction pocket in pars tensa affecting 18 ears in 16 patients who undergone T-tube insertion, regular follow-up and documentation revealed stationary pathology in 6 ears only of 6 patients, with progression of pathology in the remaining 12 ears of 10 patients. The progression was in the form of progressive hearing loss in 10 ears of 8 patients and ear discharge in 2 ears of 2 patients. The progression was actually a recurrence of retraction after tube extrusion presenting with progressive hearing loss in 10 ears of 8 patients plus ear discharge in 2 ears of 2 patients. We have performed reinserion of T-tube to the recurrent cases except one patient preferred cartilage tympanoplasty as an option. For the discharging ears cartilage tympanoplasty was done as a baseline procedure [13], in addition to modified radical mastoidectomy or cortical mastoidectomy, with posterior tympanotomy according to intraoperative findings. So success rate in long-term observation (number of ears and percentage) was 6 ears from 18 ears 33.3% (6/18) remained stationary after T-tube insertion. This percentage has been improved after T-tube reinsertion to 83.3%. (6 ears stable after T-tube insertion plus 9 ears stable after T-tube reinsertion).

Table (5): Results of long-term observation made in 2014.

<table>
<thead>
<tr>
<th>Type of pathology</th>
<th>Success rate in long-term observation number of ears and percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type T1</td>
<td>9 ears from 12 ears 75% no progression after watchful waiting.</td>
</tr>
<tr>
<td>Type T2</td>
<td>6 ears from 18 ears 33.3% remained stationary after T-tube insertion. Improved after T-tube reinsertion to 83.3%. (6 ears stable after T-tube insertion plus 9 ears stable after T-tube reinsertion).</td>
</tr>
<tr>
<td>Type T3</td>
<td>18 ears from 21 ears 85.7% success after modified radical mastoidectomy with ossiculoplasty and cortical mastoidectomy with posterior tympanotomy. Success became 100% after revision radical mastoidectomy done for the remaining 3 ears.</td>
</tr>
<tr>
<td>Types F1</td>
<td>3 ears from 3 ears 100% success after elevation or excision of the atelectatic membrane and scutum reconstruction by tragal cartilage.</td>
</tr>
<tr>
<td>Types F2</td>
<td>7 ears from 7 ears 100% success after elevation or excision of the atelectatic membrane and scutum reconstruction by tragal cartilage.</td>
</tr>
<tr>
<td>Types F3</td>
<td>11 ears of 12 ears 91.6% success after retrograde atticotomy, retrograde atticointerostomy, modified radical mastoidectomy, and posterior atticotomy with cortical mastoidectomy. Revision radical mastoidectomy done for the remaining 1 ear.</td>
</tr>
</tbody>
</table>

In Type T3: (Incontrollable, fixed retraction pocket) in pars tensa affecting 21 ears of 20 patients, who undergone canal wall down modified radical mastoidectomy and ossiculoplasty in 18 affected ears and canal wall up cortical mastoidectomy with posterior tympanotomy in three affected ears, 18 patients were doing well with no recurrence of their pathology and no hearing deterioration throughout the study years, whoever there are 3 ears have undergone revision. Radical mastoidectomy for management of cholesteatoma in two ears of the modified radical mastoidectomy group and one ear
ears of the canal wall up cortical mastoidectomy and posterior tympanotomy group. No further recurrence of their pathology. So success rate in long-term observation (number of ears and percentage) was 18 ears from 21 ears 85.7% success after modified radical mastoidectomy with ossiculoplasty and cortical mastoidectomy with posterior tympanotomy. Success became 100% after revision radical mastoidectomy done for the remaining 3 ears.

Type F1 (controllable, not fixed) affecting pars flacida in 3 ears of 3 patients and Type F2 (controllable, fixed) affecting pars flacida in 9 ear of 7 patients, who undergone elevation or excision of the atelectatic membrane and scutum reconstruction by tragal cartilage, all patients were doing well with no recurrence of their pathology and no hearing deterioration through out the study years. So success rate in long-term observation (number of ears and percentage) was 10 ears from 10 ears 100% success after elevation or excision of the atelectatic membrane and scutum reconstruction by tragal cartilage. In Type F3: (Incontrollable, fixed retraction pocket) in pars flacida affecting 12 ears in 12 patients, who undergone retrograde atticotomy, retrograde antrostomy, modified radical mastoidectomy, and posterior atticotomy with cortical mastoidectomy, the result was satisfactory in 11 ears with no recurrence of their pathology and no hearing deterioration through out the study years, except one ear for which revision radical mastoidectomy was done to manage cholesteatoma. So success rate in long-term observation (number of ears and percentage) was 11 ears of 12 ears 91.6% success after doing the above procedure. Revision radical mastoidectomy done for the remaining 1 ear.

No sensorineural hearing loss has been recorded in all groups pre-and postoperatively. In all groups overall significant hearing improvement was noted between preoperative ABG and postop ABG 2005 (p<0.0001). There was also significant change between preoperative ABG and postop ABG 2008 (p<0.0001). The ABG did not changed significantly between 2008 and 2014 in our patients (p=0.17). in group T1 and F1 no changes between pre-and postoperative audiological results was noted.

Discussion

The majority of retraction pockets which are seen in adults or older teenagers are the remains from childhood when substantial dysfunction of Eustachian tube was present, most often accompanied by otitis media with effusion. At some point such retraction pockets stabilize and did not develop any more. In some individuals however retraction pocket progressively proceeds to form adhesions and finally cholesteatoma [15].

In 1995 Chiossone [16] proposed the term preventive tympanoplasty what meant surgery of ear with good hearing but with progressively developing pathology in form of retraction pocket potentially leading to cholesteatoma formation. It meant that main indication for surgery was not hearing status as it was traditionally agreed, but anatomical state of middle ear pathology, which tended to progress overtime. Minor changes of tympanic membrane usually did not produces substantial hearing loss [17].

Chiossone in case of retraction pocket advised to separate adhesions, and put guitar-shaped silastic which has been inserted to middle ear cavity undertympanomeatal flap and annulus tympanicum. Infuture the silastic could be removed without major middle ear intervention since the end of silastic was everted in external auditory canal [18].

In major retraction pockets heroremoved the pocket and performed overlay myringoplasty with perichondrium. Successful preventive tympanoplasty means prevention of cholesteatoma formation and inexperienced hands should not cause hearing deterioration, but improvement [19, 20].

In our algorithm we suggest watchful waiting and close observation of type T1 pockets and touse T-tube in type T2 pockets. T-tube may act both as a middle ear separator but additionally improves usually poor middle ear aeration what is very important in this group of patients. After years however T-tube will finally extrude or will be removed and according to our observation substantial number of retraction pocket will return.

Looking at the patients with retraction pockets hearing is not the main issue since in many cases of chronic atelectatic otitis media in spite of advanced middle ear pathology it remains normal or almost normal for the long time. Taking hearing status only as the indication for surgery is also not proper, since this will often lead to postponing of surgery and to cholesteatoma formation or advanced adhesions, difficult for successful surgical correction.

In preventive tympanoplasty criteria for surgery should include meticulous follow-up of the patient overtime. In cases where the progression is observed management should be implemented according to the protocol. In presented cases results can be regarded as satisfactory but it should be stressed.
that treatment of retraction pocket is a dynamic process and surgery does not mean the termination of treatment.

Active dysfunction of Eustachian tube may still be present in these patients and pathology may return. This may require additional interventions facilitating ventilation of middle ear and tympanic membrane reinforcement. As it was showed the anatomic status of some ears was changing over time. Initially we treated type 2 pockets with T-tube alone in follow-up we noticed that the rate of success from 100% in 2008 dropped to 33.3% 3 years later. We should notice that this poor percentage does not reflect malpractice or improper management of this stage of the disease as it is not a real decline in the success rate but the majority of patients deteriorate after T-tube extrusion and are candidates for reinsertion of T-tube.

Considering tube surgery a minor procedure which can be repeated under local anesthesia makes us to stick to this type of management for this particular stage of pathology as a conservative or semi conservative management unless the patient seeks augmentation cartilage tympanoplasty by his own decision.

Cartilage tympanoplasty gave much more stable results so as it was showed the protocol is now changed. Some of the data may change after further follow-up since even 5 years observation period may not be sufficient for final result in this specific ear disease. Some assumptions of presented retraction pocket management may thus be modified in the future.

Conclusion:

Management of retraction pockets should be tailored individually for every patient depending on precise grading of the pocket and compulsory regular follow-up to pick up any progression and to put the patient in his proper level of management inside the management scale. Patients with early shallow pocket without infection, ossicular erosion or keratin accumulation may get benefit from watchful waiting and close follow-up beside ototubilation and elimination of predisposing factors (e.g., adenoid and allergy).

Use of cartilage as tympanic membrane reinforcement is indicated both in Charachon type 2 and type 3 pockets. Surgery should be based mostly on anatomic status and progression of retraction pocket over time rather than functional issues since hearing is frequently normal in many advanced cases.

Preventive tympanoplasty gives good anatomical results in retraction pocket patients with progressive pathology and in experienced hands should not cause hearing deterioration but improvement.

Formation of retraction pocket is a dynamic process and patients after initial surgery or any treatment modality should be followed-up and may require additional interventions in the future.

References


الملخص العربي

أن علاج جيوب طبل الأذن يجب أن يفضل تباعًا لحالة كل مريض وتباعًا للمرحلة أو المراحل المرضية للجب أولاً ويتحدد بعد عمل متابعة دورية منتظمة والتي يمكن أن تكتشف أي تطورات مرضية تعاني المراحل المرضية للأذن ووضع المريض في المستوى العلاجي الملائم له المرض أو الجيوب المريحة واستكمال من تأكيد بعض المريض والتطورات مع مراقبة الأذن. بالإضافة إلى معالجة بعض العوامل المباشرة لحدث المرض مثل الحساسية أو التغييرات. إن التعرف على العلاج أو المراحل المرضية جيوب المجوسي 2 و 3 يجب أن يعتمد على التطور التشريحي للجب وليس على الحالة الوظيفية للأذن حيث أن السمع يكون طبيعي في كثير من الحالات ذات المراحل المتاخرة مرضية.