Myringoplasty with temporalis fascia

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Abstract:

A retrospective study for myringoplasty operations at ENT department, Alain hospital, Alain city-UAE for the last 5 years (2004-2009) done. Total 64 patients with central tympanic membrane perforation were operated by one surgeon using Temporalis fascia graft for repair and using underlay technique. In 56 cases (87%) graft were taken completely while in 8 (13%) cases graft, were partially taken and patients had smaller residual perforation. 39 ears (60%) had normal hearing or improved hearing up to 15 dB air-bone gape. The average time for follow up was 37 months (2-72 months).

Keywords: Myringoplasty, Temporalis fascia graft.

Objective:

To analysis the result of our surgical treatment for tympanic membrane perforations due to tubo- tympanic chronic suppurative otitis media (CSOM) as evaluated by improvement in hearing and rate of graft survival.

Introduction:

Myringoplasty is an operation by which one repair a central perforation of tympanic membrane. These perforations are residual perforation after tubotympanic CSOM or after long term insertion of ventilation tubes.

Horst Wullstein [1] (1956) said, "The tympanic membrane has two functions; sound pressure transformation to the oval window and sound protection of the round window. The outer ear function is to capture air pressure waves. The middle ear function is to convert air pressure waves efficiently into endlymphatic fluid waves, while the inner ear (cochlea) serves to convert fluid waves into nerve impulses.

This sound-transforming mechanism includes the ossicles whose lever action adds 3 dB to the sound level at the oval window. The hydraulic principle due to the difference in the surface area of the tympanic membrane and the stapedial footplate increases the hearing level by 27 dB.

The tympanic membrane also serves to protect the round window from sound by efficiently conducting the pressure waves to the oval window and delaying the arrival of pressure waves to the round window.

The Eustachian tube, which is normally closed, but opens for 0.1 to 0.2 seconds during swallowing or yawing to allow air to move between the nasopharynx and middle ear, and to equalize the pressure across the tympanic membrane.

Common indications for myringoplasty are:

1. Hearing loss which is usually less than 30-45 dB of conductive type [2,3]; hearing loss more than that is usually due to ossicular abnormalities.

2. Recurrent ear discharge and infections after swimming.

Most of the myringoplasty done by using underlay technique, which means inserting the temporalis fascia graft medial to the remnant of the tympanic membrane.

Complications after Myringoplasty may include:

1- Failure of the graft to (take). This is usually due to infection or poor technique which is resulting in residual or recurrent perforation and /or lateralization of a graft.
2- Reduction in hearing. This may be due to damage of the ossicular chain, or inner ear damage from excessive ossicular manipulation under the procedure.
3- Trauma to chorda tympani & facial nerve although extremely rare.
4- Tinnitus occurs post operatively but usually transient
5- Vertigo which transient for short period post operatively.

Material & methods:

64 ears were seen in ENT department at Al-Ain Hospital-Al-Ain city-UAE, during period from January 2004 till January 2009. All cases had chronic supurative Otitis media with residual dry central tympanic membrane perforation of different sizes and sites.

Retrospectively the medical records of these cases reviewed. The following parameters were estimated: Age, Sex, Site, and Size of perforations.

All perforations were central perforations of different sizes (subtotal, Ant. & Post.). Marginal and attic perforations were excluded.

Pre operative hearing threshold as recorded by previous pure tone audiogram were estimated in dB by calculating average hearing loss in speech frequencies (500, 1000, 2000 Hz). Air-bone gape at the same frequencies were also recorded.

Post operatively again data collected, pure tone audiogram was done during subsequent follow up visits. The hearing threshold and post operative air-bone gape were recorded. Acceptable hearing improvement was considered when the air-bone gape either closed or reached to 15 dB.

Graft regarded successfully taken if there was no residual perforation with in first two months post operatively.
The duration of post operative follow up was calculated in months.

Results:

The study shows that 38(59%) cases were Male & 26(41%) female. (Figure 1).
Their ages ranged between 8-55 years with average of 31, 5 years.
43(67%) are left side while 21(33%) were right. (Figure 1).

31(48%) perforations were subtotal, 22(34%) were posterior and the rest 11(18%) were anterior (figure2).

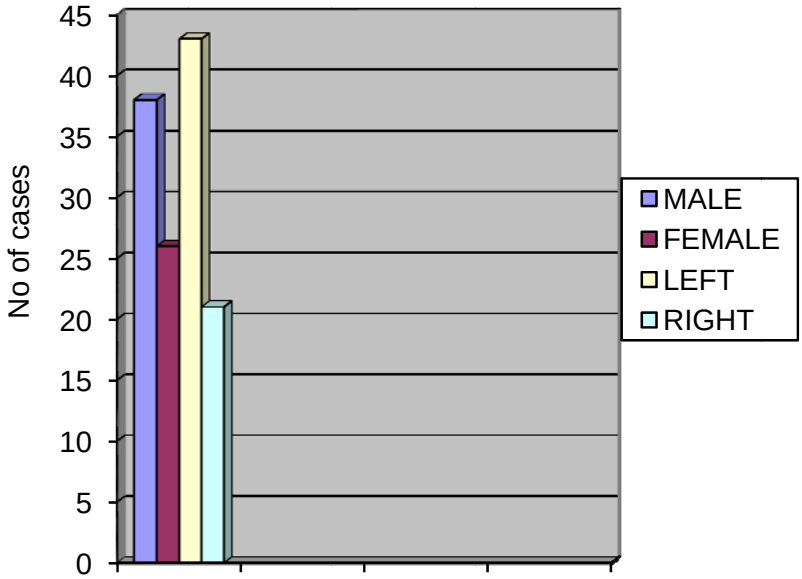

Figure (1): Distribution of patients according to sex & Site of perforations.

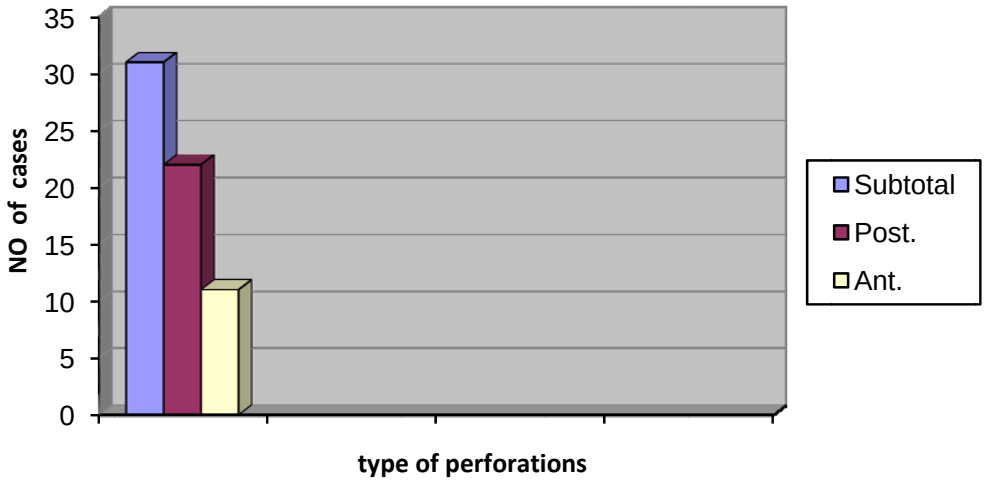

Figure (2): Distribution of patients according to the Sites of perforation.

The average hearing loss as recorded from air conduction threshold for (500, 1000, 2000 Hz) frequencies was 47, 5 dB (25-70 dB), (figure 3).

Air bone gape was ranging from 10-45 dB with an average of 27.5dB (figure3).

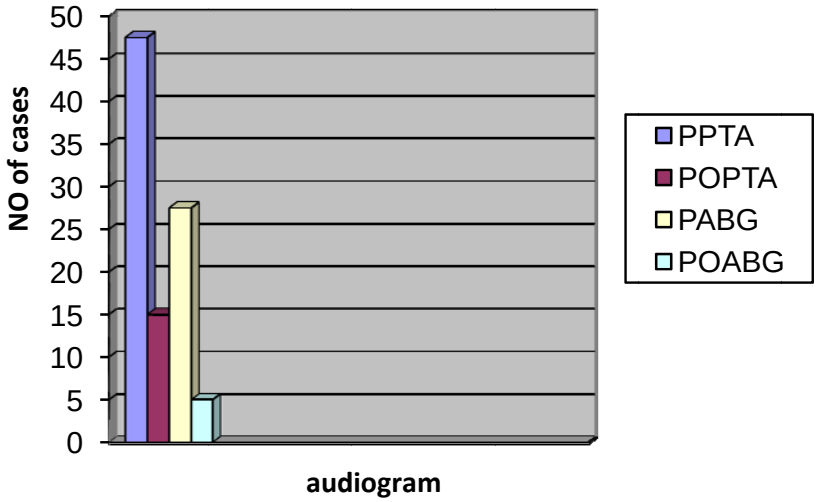

Figure (3): Pre (PPTA) & post operative (POPTA) pure tone audiogram with pre operative (PABG) and post operative (POABG) air bone gape.

No post operative perforation in 56 (87%) of the cases, while in 8 patients residual perforation were present, 5 patients of them had subtotal perforations pre operatively and 3 had anterior perforations.

Accordingly in 56 case the graft was taken with complete success (after two month follow up) (figure 4, 5). The rest,(8)cases, had incomplete graft take.

Figure (4): Distribution of patients according to post operative graft taken or not.

Post operative hearing improvement estimated by air bone gape closure or close to the normal range (between 10-15 dB).

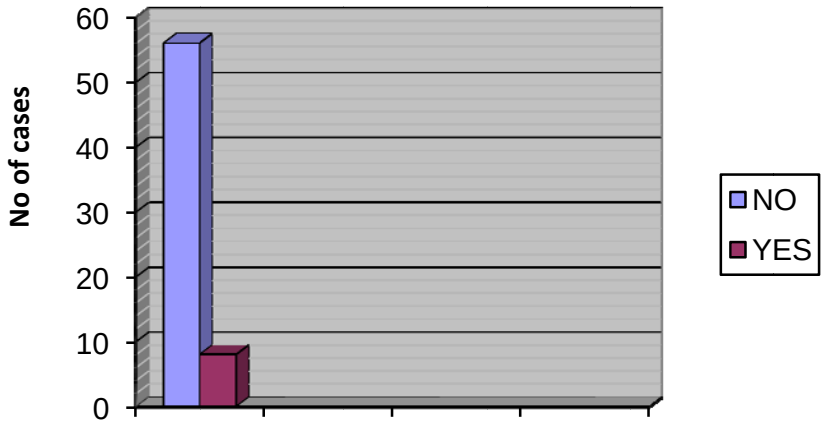

Figure (5) Distribution of patients according to presence or absence of post operative perforation.

In 20 patients air bone gape was completely closed and in 19 patients closure was to within normal range. Therefore 39 (53%) had normal air bone gape. 13 patients (20%) were still with abnormal gape (more than 20 dB) and the remaining 12(18%) unfortunately no records were found.

The follow up was ranged from 2-72 months with an average of 37 months. In 12 patients post operative records were not founded after the first post operative visit. In these cases the graft were reported to be taken before assessment of hearing post operatively.

Discussion:

Chronic Otitis media develops after longstanding inflammation of the middle ear cleft. The cause of chronicity & residual perforation are including, recurrent acute Otitis media, unhealed traumatic perforation of the tympanic membrane, post ventilation tube insertion and Eustachian tube dysfunction. The exposure to chronic inflammatory mediators leads to failure of healing of the damaged ear drum.

Eventually Eustachian tube dysfunction leads to negative middle ear pressure that causes retraction of the tympanic membrane and even perforation [3,4].

In this study we included only cases with tubo- tympanic type of chronic Otitis media with central perforations of the tympanic membrane, without cholesteatoma. Myringoplasty (Tympanoplasty type I) was used for closure of the perforation using underlay technique.

The aim of myringoplasty is to give a patient a substantial hearing improvement and at the same time to get an ear which resistant to water [4].

This study shows a successful rate of 87% the graft survival which equal or better than other results of other studies 67.5% Monpo Romenah etal report [5]

& Jurovizki I etal stated 70.8% [6] for 450 cases over 12 years follow up.

Another study by Vartiainen E, Nuutinen J in 1993 shows that the successful rate was 88% [7]. Other study in 2010 shows that success rate was 71% [8]. Accordingly our results were found to be within the standard level world wide.

The study shows that the post operative graft rejection was mainly in subtotal type of perforation and in area in front of handle of malleus. This portion of ear drum is difficult to be inspected adequately during the surgery, which leads to improper cleaning of sequamous epithelium at this site which results in improper graft take and healing [9]. The remaining epithelium will grow around the anterior edge of the perforation and impairs healing of the graft. This was concluded in our previous study in 1990 [10].

Hearing improvement after surgery: Our study shows that in 60,9% of the cases, hearing becomes better as estimated by air conduction threshold and closure of air bone gape at speech frequencies (500, 1000, 2000Hz). This is found also to be similar to other studies [10,11].

The site of perforation play important role. Subtotal & anterior perforations may be left with post operative perforation and incomplete graft takes and hence remained with impaired hearing post operatively [12,13]. This was concluded with our results of 8 cases with incomplete success, In 5 of them (subtotal) and 3 (Anterior) perforations; they had post operative failure of graft & incomplete hearing improvement.

Conclusion:

From this study we conclude that:

1. For patients suffering from CSOM with central perforation, myringoplasty using temporalis fascia graft using underlay technique is successful and effective and still highly recommended.
2. The numbers of cases were not many; this is due to good improvement of primary health care in this district which made CSOM to be a rare disease now a day.
3. Surgical treatment for cases of CSOM should be centralized to a special center from cost and prognostic poins of view. As these cases are not too many and result of surgery would be much better if all cases were managed by a surgeon who is well trained in middle ear surgery.
4. Cases of CSOM have become rare after good improvement in the primary health care and as the cost of establishment of surgical centre for middle ear surgery is very high, therefore such establishment shall be restricted and centralized to special hospital where trained middle ear surgeons available and all cases shall be referred there for surgical management.

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نەشتەرگەری چاك كردنەوەی درِاوی پەردەی گوێ بە بەكارهێنانی پەردەی ماسولكەی لاتەنیشتی سەر

پوختـە

ئەم توێژینەوەیە بریتیە لەو كەسانەی كە پەردەی گوێیان درِاوە وە بینیراون و چارەسەر كراون لە نەخۆشخانەی (العین) لە أبوظبي لە ماوەی 5 سالّی نێوان 2004-2009. 64 كەسی كەوا پەردەی گوێیان درِا بوو نەشتەرگەری كراون لە لایەن یەك پسپۆری نەشتەرگەری گوێ. لەمانە 56 كە دەكاتە (87٪) نەخۆش پەردە تازەكە بە باشی وەرگیرا بوو وە درِاوێكە چارەسەر كرابوو. لە 8 (13٪) درِاوێكە بەشێكی داخرابوو وە درِاوێكە بچووك ببووەوە وە باشتر ببوو، 39 نەخۆش (60٪) بیستیان دوای ئەم نەشتەرگەریە باش ببوون تا رِادەی 15 نمرەی بیستن كەوا بە نۆرمالّ دادەنرێت. هەروەها توانرا نەخۆشەكان تێبینی بكرێن بۆ (2- 72) مانگ بە ﴿ تێكرای 37 مانگ﴾ دا دوای نەشتەرگەری. لەم توێژینەوەدا ئەنجامدانی ئەم نەشتەرگەریە بە باش دەزانرێت بۆ چارەسەركردنی ئەو نەخۆشانەی كە پەردەی گوێیان درِاوە كە بە هەمان شێوەو تەكنیك ئەنجام بدرێت.

ترقيع طبلة الاذن بغشاء العضلة الصدغية

الخلاصـة

هذا البحث عبارة عن بحث ذات أثر رجعى لحالات تمزق طبلة الاذن و اجراء عمليات ترقيع طبلة الاذن لهم. الحالات لفترة خمس سنوات من 2004-2009 والتي عولجوا في مستشفى العين في ابوظبي. عولج 64 حالة تمزق طبلة الاذن من قبل جراح واحد و رقع طبلة الأذن بغشاء العضلة الصدغية بطريقة وضع الغشاء تحت بقايا الطبلة الممزقة. نجحت العملية في 56 حالة (87%) بالتحام الطبلة الجديدة كاملة و 8 حالات (13%) بالتحام طبلة جزئيا. في 39 حالة (60%) تحسنت درجة السمع عندهم الى حد 15 وحدة سمعية. تمكنا في متابعة حالة المريض بعد العملية لفترة يتراوح بين 2- 72 شهر بمعدل (37) شهر بعد العملية. لايزال نوصي باجراء عملية ترقيع طبلة بهذه الطريقة و بأستعمال غشاء العضلة الصدغية.