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Ear Protrusion Post Tympanoplasty: Sulcus Incision Immediately Through Post Auricular Groove Versus 5 mm Post Auricular Incision

Saleh Al Amry^{1*}, Hassan Alshehri², Abdulrahman Al Sanosi³

^{1,3} Otolaryngology Unit, ENT Department, King Abdulaziz University Hospital . PO box 245 Riyadh 11411 Saudi Arabia

² ENT Department, Prince Salman Hospital, Ministry of Health, Riyadh, Saudi Arabia

*Corresponding authors

Email: saleh.alamry@gmail.com

Mobile:00966506216068

Mailing PO box 245 Riyadh 11411 Saudi Arabia.

Fax+966114775791

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Abstract

Tympanoplasty is one of common surgical procedures in ENT. Pinna protrusion as complication of tympanoplasty is not well mentioned in literature. Post auricular approaches for tympanoplasty is well documented in literature and can cause changes in ear pinna.

Aim of the work is to test the effect of ear site of post auricular incision on the ear protrusion comparing sulcus incision immediately through post auricular groove with 5 mm post auricular incision.

A prospective non-controlled study was conducted. It included 34 subjects had the same diagnosis and going for the same procedures. The distances from post-auricular area to the lateral aspects of helix of pinna was taken at three different levels (upper, middle and lower part), in addition to the measurement of the maximum ear protrusion. The interval of measurements was taken intra operatively before infiltration of local anaesthesia, at first day, 2 weeks, one month

and three months postoperatively.

Results showed that there were statistically significant changes in upper, middle, lower levels of the distances from post-auricular area to the lateral aspects of helix of pinna as well as in maximum protrusion of the ear pinna after one day postoperative from preoperative readings in both procedures. After one month postoperatively, at all levels as well as regarding pinna protrusion, there were statistically significant differences from preoperative measurements in case of 5 mm auricular incision. However, in case of sulcus incision, the differences between preoperative measurements at the three levels as well as in pinna protrusion were not significantly differ from their measurements after one month. Maximum pinna protrusion was not changed significantly after three months in both types of incisions.

In spite of small sample number of study sulcus incision showed less effect on the ear protrusion, particularly after one month postoperatively as compare to 5mm post auricular incision in addition to its cosmetic advantage.

Keywords: tympanoplasty; sulcus; postauricular; ear protrusion

Introduction

Tympanoplasty is one of common surgical procedures in ENT. It is safe, easy straightforward procedures , many factors influencing the success rate including the age, site and size of perforation, surgical technique and the experience of surgeon. In general, the success rate is ranging between 65 to 90 %.^(1, 2)

The tympanoplasty procedure has it is own complications like failure of grafting, inner ear trauma, change of taste and vertigo. Pinna protrusion as complication of tympanoplasty is not well mentioned in literature.

Transcanal, endaural and post auricular approaches for tympanoplasty are well documented in literature.⁽³⁾ Each one has it is own advantages and disadvantages. The first two approaches could not do any changes in ear pinna but post auricular approach could do. One of the side effects of the post auricular incision its effect on ear protrusion either over or under protrusion to avoid this effect some surgeon use to do skin incision is carried out along the hairline and is made only through skin.⁽³⁾ Others advice to do the post auricular incision about 1 cm behind the post auricular crease, a location that simplifies closure,⁽⁴⁾ some of surgeon do it about 0.5 cm from the post auricular sulcus.⁽⁵⁾ So, there is no clear agreement regarding the most recommended sit of incision also we couldn't find study to evaluate the effect of the different site of incisions on the ear protrusion.

In our study we are going to test the effect of ear site of post auricular incision on the ear

protrusion comparing sulcus incision immediately through post auricular groove with 5 mm post auricular incision.

Methods and materials

A prospective non-controlled study was conducted. It included 34 subjects had the same diagnosis and going for the same procedures. The procedures were explained to participants fully and upon the agreement, the consent was signed. Patient who had previous post-auricular approach were excluded.

Measurements: The distances from post-auricular area to the lateral aspects of helix of rim and lobule was taken at three different levels (upper, middle and lower part), in addition to the measurement of the maximum ear protrusion (Fig. 1) . The interval of measurements was taken intra operatively before infiltration of local anaesthesia, at first day, 2 weeks, one month and three months postoperatively.

Surgical steps:

Infiltration of post-auricular area with local anaesthesia was performed. Post-auricular incision at 0.5cm from sulcus was used for 17 candidates while in the other 17 candidates, incision through sulcus was done. Skin and subcutaneous incisions were made by knife. Periosteal flap was elevated and window was created. Middle ear cavity was entered after lifting up the tympanmeatal flap. The post auricular incision was closed in layers; the first layer was periosteal layer using 3/0 vicryle and the skin closed by 3/0 nylon. Standard post auricular dressing was done and then, removed in the first operative day. Stitches were removed after 10 days in first postoperative visit.

Results

As shown in table 1, there were statistically significant changes in upper, middle , lower levels of the distances from post-auricular area to the lateral aspects of helix of pinna as well as in maximum protrusion of the ear pinna after one day postoperative from preoperative readings in both procedures (sulcus incision and 5 mm auricular incision). However as evidenced by p-values, the changes were less in case of sulcus incision.

Table 1: Comparison between the two different techniques after operation (at 1st day)

	5 mm post auricular incision mean±SD*	P-value	Sulcus incision mean±SD*	P-value
Preoperative (Upper) 1 st day	15.06±4.07 18.41±4.76	0.001	18.14±4.42 20.00±4.11	0.005
Preoperative (Middle) 1 st day	17.29±3.22 20.24±4.86	< 0.0001	19.50±3.23 21.14±4.02	0.034
Preoperative (Lower) 1 st day	14.18±1.88 16.00±2.29	0.003	15.14±3.28 16.00±3.01	0.032
Preoperative (maximum ear protrusion) 1 st day	18.71±3.14 20.94±4.37	0.003	20.43±3.18 22.21±3.73	0.015
*In mm				

After two weeks postoperatively, the changes in all levels as well as in pinna protrusion were almost the same as after one day in case of 5mm auricular incision (Table 2). However, in case of sulcus incision, there were no significant differences from preoperative measurements of middle level and in pinna protrusion.

Table 2: Comparison between the two different techniques after operation (at two weeks)				
	5 mm post auricular incision mean±SD*	P-value	Sulcus incision mean±SD*	P-value
Preoperative (Upper) Two weeks	15.06±4.07 18.53±4.40	0.002	18.14±4.42 20.93±4.65	0.005
Preoperative (Middle) Two weeks	17.29±3.22 19.71±3.98	0.006	19.50±3.23 20.50±4.09	0.396
Preoperative (Lower) Two weeks	14.18±1.88 15.41±2.32	0.009	15.14±3.28 16.36±2.44	0.007
Preoperative (maximum ear protrusion) Two weeks	18.71±3.14 20.94±3.27	0.002	20.43±3.18 22.00±3.60	0.080

*In mm

After one month postoperatively, it is obvious from table 3 that at all levels as well as regarding pinna protrusion, there were statistically significant differences from preoperative measurements in case of 5 mm auricular incision. However, in case of sulcus incision, the differences between preoperative measurements at the three levels as well as in pinna protrusion were not significantly differ from their measurements after one month. Maximum pinna protrusion was 20.43±3.18 preoperatively and became 20.29±2.81 after one month in case of sulcus incision while it was 18.71±3.14 preoperatively and became 19.59±2.21 in case of sulcus incision.

Table 3: Comparison between the two different techniques after operation (at one month)

	5 mm post auricular incision mean±SD*	P-value	Sulcus incision mean±SD*	P-value
Preoperative (Upper)	15.06±4.07	0.002	18.14±4.42	0.324
One month	16.82±3.61		19.36±3.78	
Preoperative (Middle)	17.29±3.22	0.006	19.50±3.23	0.501
One month	18.65±2.52		18.93±2.73	
Preoperative (Lower)	14.18±1.88	0.009	15.14±3.28	0.196
One month	14.88±2.60		15.64±2.44	
Preoperative (maximum ear protrusion)	18.71±3.14	0.002	20.43±3.18	0.751
One month	19.59±2.21		20.29±2.81	

*In mm

Three months postoperatively, there was statistically significant difference at upper and lower levels in case of 5 mm auricular incision whereas there were no statistically significant differences at all levels in case of sulcus incision. Maximum pinna protrusion was not changed significantly after three months in both types of incisions.

Discussion

This study aims to investigate the effect of two different recognized types of post auricular skin incisions on the ear protrusion. Up to our knowledge, the effect of type of post auricular incision on the degree of ear protrusion has discudes only In one study by Paul et al⁽⁶⁾, he study the effecte 5mm post auricular incision on long-term ear protouision but he didn't study the effect of site of inscion on the ear protrusion . In our study we selected all case of tympanoplasty all other type of mastoid surgery was excluded to eliminated as much as we can the other contributing factors Thus, this is a unlike study of exploratory nature. We intended to recruit candidates who underwent tympanoplasty only.

Table 4: Comparison between the two different techniques after operation (at three months)

	5 mm post auricular incision mean±SD*	P-value	Sulcus incision mean±SD*	P-value
Preoperative (Upper) 3 months	15.06±4.07 17.76±2.66	0.011	18.14±4.42 18.43±3.48	0.751
Preoperative (Middle) 3 months	17.29±3.22 17.35±2.76	0.727	19.50±3.23 18.21±2.78	0.122
Preoperative (Lower) 3 months	14.18±1.88 15.88±2.03	0.002	15.14±3.28 14.57±2.03	0.224
Preoperative (maximum ear protrusion) 3 months	18.71±3.14 19.24±2.64	0.461	20.43±3.18 19.50±2.79	0.237

*In mm

Ear protrusion can cause bad impact on the patients. Significant cases of auricular movement may result in the patient being concerned about their self-image. Which in turn can lead to Psychological issues⁽⁷⁾. Some functional problems, such as eyeglasses not fitting well, may also occur in severe cases.⁽⁸⁾

In our study result suggest, however, that the closer the post auricular incision is less impact on ear protrusion at least on first few month post operative , the other important point is that sulcus incision is more hidden by the post auricular groove in Addison to its orientation with crease of skin. The period of post operative follow up Tympanoplasty is defined as a surgical procedure to eradicate infection and restore the function of the middle ear.⁽⁹⁾

In spite of small sample number of study sulcus incision showed less effect on the ear protrusion as compare to 5mm post auricular incision in addition to its cosmetic advantage

Conclusion

In our study in spite of small sample number we could find less effect of sulcus incision on the ear protrusion as compare to more posterior incision.

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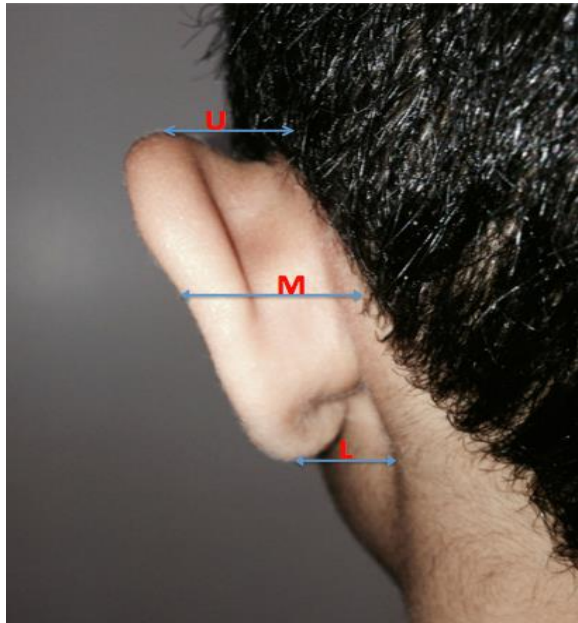


Fig.1. The three auricular measurement used in our study: (U) upper part of helix, (M) middle of auricle,(L) lower lobular part.

Authors Column



Saleh Saker ALamry Born In Namass Saudi Arabia 1975 Married And father Of one boy and two daughters Bachelor degree of Medicine and surgery at the end of academic year 2000 king Saud University Riyadh Diploma in aviation medicine at the armed Force aero medical center in cooperation with Royal Air Force Center of aviation United Kingdom in 3/2/2003 Joined Saudi Board Program in ORL&HN during the period October 2005 to September 2010, in addition to Saudi board I pass Arab board and European board 2010. Fellow of Otology, Neurotology King Saud University 2014. Member of Saudi ORL Society. Chairman of 3rd Riyadh Temporal Bone Surgical Dissection Course 1---5 December 2013. Design a catheter for injection of medication Through Eustachian tube instead of trans---tympanic injection. Patent Number 3449 on 18/06/2014 registered in King Abdul---Aziz City for since and technology. Attending now with prof Mario Sanna in Italy fellowship of skull base.

