

Refinements In Otoplasty Technique For Bat Ears

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ABSTRACT:

BACKGROUND:

Protruding ear is generally the result of a malformed antihelix, hypertrophied/malpositioned concha or in most cases a combination of all these conditions.

METHODS:

Otoplasty is a common plastic surgical procedure performed to correct protruding ears. A description is presented of a posterior approach in prone position under GA with few modifications. Open anterior cartilage scoring with toothed forceps, conchoscaphal Mustarde suturing, conchamastoid suturing, or a combination were used to correct the deformity. The follow-up periods ranged from 6 – 8 months. Postoperative evaluation was done by another doctor.

RESULTS:

There were no early complications. There was one late complication requiring revision surgery. All patients achieved satisfactory results, as determined by questioning of both patients and parents 6 months postoperatively.

CONCLUSION:

Prone position under general anesthesia was found to be safe and efficacious procedure. The use of toothed forceps seems to be a good alternative when specific cartilage scorers are not available. Using needles for marking the site of Mustarde sutures appear to be more practical than marking with methylene blue.

KEY WORDS: Bat ear, prominent ear, otoplasty, conchal setback, and conchal reduction.

INTRODUCTION:

The ear is more than what we hear with. We are rated by those who observe us by our ear shape. Prominent ear (Bat Wing Ear) is a common congenital anomaly affecting approximately 5% of the general population⁽¹⁾. Fifty nine % of affected individuals have a family history, and transmission is in an autosomal dominant pattern with variable penetrance⁽²⁾. Protruded ear is defined in terms of both distance and angle. The measured distance from the lateral plane of the helix to the post auricular scalp tends to be less than 2cm in the aesthetic ear⁽²⁾ (fig:1&2). The normal cephaloauricular angle is approximately 21⁰-25⁰. A more obtuse angle (> 25⁰) may cause the ears to appear overly prominent. According to Egloff et al.⁽³⁾, protruded ear is the consequence of various isolated or combined deformations (fig:3) which include:-

1. Failure of the antihelix to develop fully resulting in a conchoscaphal angle >90⁰.^(4, 5, 6)
2. Conchal enlargement and /or angulation. Enlargement of concha in excess > 1.5 cm deep. Angulation or malposition when the cranioauricular angle > 40⁰.^(1, 5)
3. Any of the above problems can be seen in combination with or without lobular protrusion⁽⁴⁾.
4. Miscellaneous conditions including macrotia, a third crus of the antihelix (Stahl's ear) and Darwin's tubercle^(2, 3).

Dieffenbach is usually considered the first who corrected the prominent ear in 1845, his technique was used for correction of a posttraumatic deformity⁵. The earliest cosmetic otoplasty was reported by Ely in 1881⁽⁵⁾. Proper selection of the surgical technique is dependent on the surgeon's understanding of the surgical procedure which is best founded on an understanding of the historical bases for the operative steps. Although performed a wedge excision of full thickness skin and cartilage from the conchal bowl. Luckett, in 1910, introduced the concept of restoration of the antihelical fold. He used a vertical curved incision and closed it with everting sutures. Unfortunately, His procedure tended to create an abnormally sharp antihelix^(7,4). Gibson in 1958, demonstrated through experimental observation that the cartilage spontaneously bends away from the scored surface

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McDowell's goals in otoplasty

1. correction of protrusion especially in the upper third of the ear.
2. the helix should be visible beyond or lateral to the antihelix from the frontal view.
3. the helix should have a smooth and regular contour throughout.
4. the post auricular sulcus should not be markedly disturbed.
5. the ear should not be placed too close to the head (Plastered down appearance)⁽⁵⁾.
6. the contours and position of the two ears should match closely, but not be symmetrical⁽⁷⁾.
7. avoiding the sharp antihelical fold commonly associated with techniques in which the cartilage is incised along the new antihelix (as in the Lockett procedure and its modifications)^(8,6).

85% of ear development occurs by the age of 3 years⁽⁹⁾. Prominent ears typically do not affect a child's self-image until the child is around 5-6 years of age. Therefore, otoplasty is ideally performed in the interval between age 4 and 6 years so that the child can avoid the psychological trauma of ridicule by classmates^(2,3,5).

This study was conducted to demonstrate some modifications and refinement in otoplasty surgery on 16 cases of bilateral prominent ear.

PATIENTS AND METHODS:

From April of 2005 to September of 2005, 16 patients with bilateral prominent ears had otoplasty under general anesthesia in Babylon city. The patients were 11 males and 5 females. All were healthy, ranging in age from 4 to 20 years, with a mean age of 7 years. Analysis of the causes of ear prominence was done for all patients. All patients had both poorly defined antihelix with malposition of concha and in one patient there is hypertrophied concha in addition. The follow up period ranged from 6 to 8 months, which included postoperative examinations at 2 days, 1 week, 1 month and 6 – 8 months. Before induction of anesthesia, a gentle setback of the helix with finger pressure will show the antihelix and estimate the amount of conchal resection needed. Marking by a pen was done for the supposed antihelical tube. Patient was then turned into prone position (figure 4). Planning of a simple ellipse centered over the post auricular sulcus. Epinephrine 1:100,000 is infiltrated subcutaneously on both surfaces of the ear. Five mm incision was made just below the eave of the helical rim, at the top of the planned superior crus of the antihelix, through which dissection along the proposed antihelix was done. Then cartilage scoring with one arm of Adson-Brown toothed forceps is continued till the cartilage can bend away from the anterior plane into the desired antihelical fold. Care must be taken to avoid scoring through the whole thickness of the cartilage to avoid sharp edge results. The incision was left without suturing. Then attention is turned to the posterior surface of the auricle. Through the ellipse posteriorly, exposure of the conchal bowl is achieved without the dissection of the perichondrium off the cartilage. For antihelix reconstruction, usually 4 Mustarde conchoscaphal horizontal mattress suture (4-0 undyed prolene) were used, facilitated by using through and through needles as markers for its precise placement. Each suture is lightly tightened to test for the desired correction needed. The knots were tied while observing the development of the antihelical fold. The sutures were placed in radial fashion from superior to inferior. Attention is directed then to the conchomastoid area. Resection of a portion of the soft tissue in the post auricular sulcus is done. Usually 2 mattress sutures are placed between the concha and the mastoid periosteum (concha setback). In only one case of conchal hypertrophy, 1cm conchal resection was done through the posterior approach and the edges of the conchal cartilage then approximated with 3 interrupted 5/0 clear prolene sutures. The retro auricular closure was accomplished with a running 4/0 fine absorbable sutures. Non adherent dressing was then applied while the patient still in the prone position. The dressing is maintained for 2 days, after which light head band was used to hold the ears in place for 2-3 weeks.

All patients were placed on a 5 days regimen of cephalosporine.

RESULTS:

There were no early complications. There was one patient with mild telephone deformity on one side requiring revision surgery (figure 6). All patients achieved a satisfactory result, as determined by questioning of both patients and parents after 6 months .Postoperative evaluation was done by a colleague. The usual operative measurement of 1.8cm from the anterior surface of the helix to the scalp has rarely exceeded 2 cm six months postoperatively.

DISCUSSION:

The prone position under general anesthesia is safe and efficacious .It allows a good access to both ears and allows comparing both ears at the same time through out the operation without the need to changing the position of the head during the procedure. The application of the dressing can be easily applied while the patient is in this position with out the need to suspend the head from the operating table (figure 4). Most authors perform anterior cartilage scoring by posterior approach, in this series ,a small five mm anterior skin incision along the inside edge of the helix seems to be a good alternative. It allows better control of the scoring, and leave a nice scar despite left unsutured because it will be hidden below the eave of the helical rim. Although various devices for cartilage scoring have been reported, such as the scalpel, hypodermic needle,dermabrasion tool⁽¹⁰⁾ and endoscopic instrument for carpal tunnel release ⁽¹¹⁾ ,Adson-Brown toothed forceps proved to be simple and efficient cartilage scorer. Converse, Wood –Smith,stated that cartilage –breaking techniques are especially useful for the stiffer cartilage of adults. They used full thickness incisions through the cartilage to permit tubing. Unfortunately, secondary sharp ridging remains the main complication ⁽⁵⁾. Gibson and Davis in 1958 discovered that deformation of a cartilaginous plate was mainly due to elastic fibers of the perichondrium and of the superficial part of the cartilage ⁽⁴⁾. Consequently, scoring the anterior surface of the cartilage was found to be

appropriate if properly combined with Mustarde conchoscapal stitches. The preserved perichondrium decreases the possibility of sutures pulling through the cartilage as it could be a cause of postoperative recurrence. We applied needles as landmarks for precise placement of the sutures and it seems to us that the needles are better than marking just with methylene blue dye. The use of sutures with noncutting needle prevents the small cuts in the cartilage that allow sutures to tear through. It is advisable to use undyed suture to avoid its being visible through thin skin. Usually 4 horizontal mattress sutures (4 – 0 clear nylon), radially oriented, are necessary to get a fine well formed antihelix.If the antihelical fold has been recreated in a vertical orientation instead of a gentle radial orientation, it will result in what is known as (post surgical ear appearance)which is also the result of incorrect antihelical scoring⁽¹⁾. Telephone ear deformity may result from aggressively setting back the middle one third of the helical rim which is esthetically not acceptable and that's why the application of 4 Mustarde sutures should radially oriented and adjusted to prevent this deformity. When there is conchal hypertrophy, the concha should be reduced according to its severity and can be adjusted through the same posterior incision. It is advisable to use more than one conchamastoid suture because disruption of a single suture may reproduce the original deformity while 2 sutures if properly applied result in a more pleasing angle between conchal cartilage and mastoid prominence .It also can prevent the soft tissue to act as fulcrum to cause an imbalance of the anterior wall and tragus.It is desirable to slightly overcorrect the setback , judged by helical rim looking just inside the antihelix as the sutures might slightly loosen up during early postoperative result. Fortunately the two ears are rarely viewed together hence absolute symmetry is a goal that is not easy to achieve and differences of 1 – 2 mm in the measurement of the prominence will not affect the final acceptable aesthetic appearance. Excision of an ellipse of posterior skin will aid in the fine adjustment of the surgical procedure.

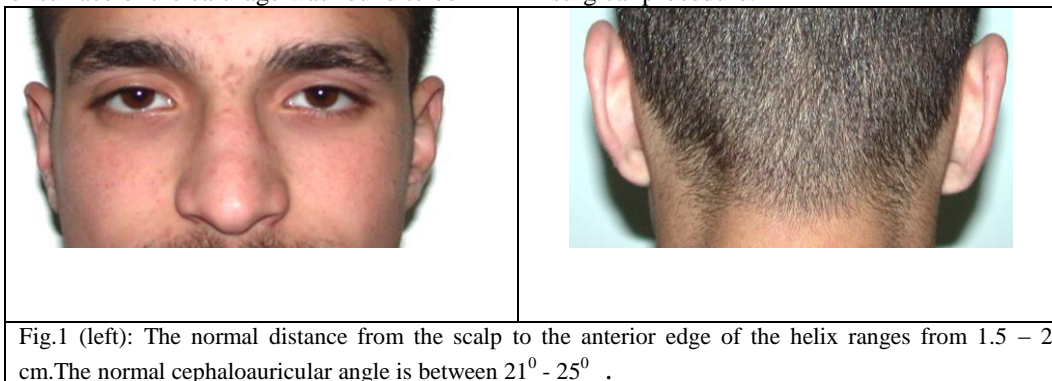


Fig.1 (left): The normal distance from the scalp to the anterior edge of the helix ranges from 1.5 – 2 cm.The normal cephaloauricular angle is between 21° - 25° .



Fig.2:Components of prominent ear deformity.(1): cephaloauricular angle $>25^{\circ}$. (2):Poorly defined or absent antihelical fold.(3):Conchoscaphal angle $>90^{\circ}$.(4):Conchal excess >1.5 cm deep &or malposition of the concha with a cranioauricular angle >40 degree.(5): sometime association with lobular protrusion.

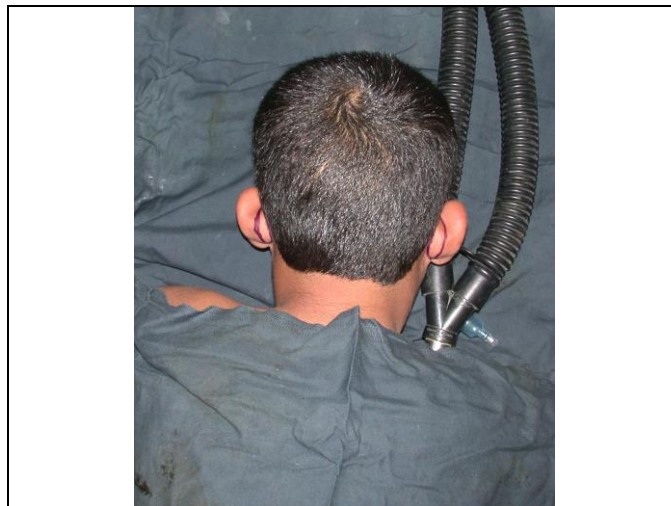


Fig. 3: Prone positioning of the patient under general anesthesia.Secure placement of dressing can be done without the need to move the head.

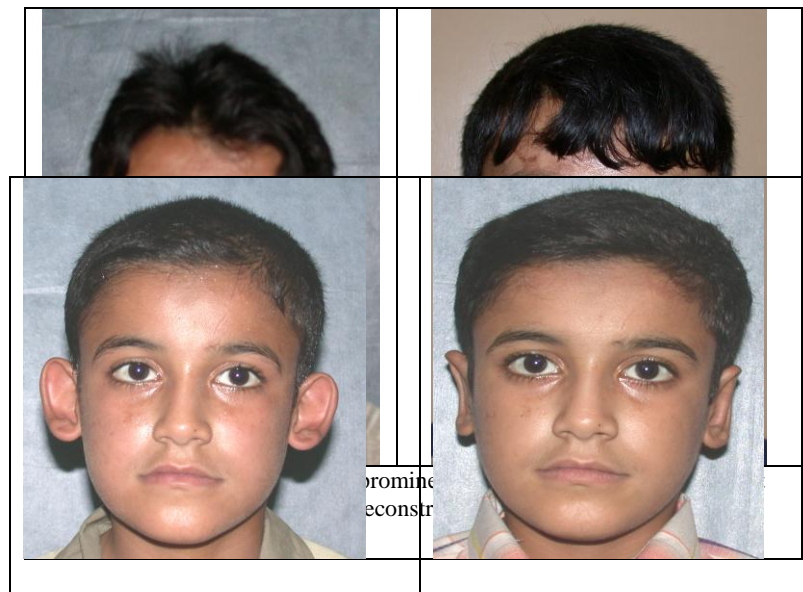




Fig. 5: (Left views): Bilateral ear prominence in a 7 years old boy. (Right views): 6 months postoperatively shows over correction of the middle part of the right ear resulting in mild telephone deformity.



Fig. 6: (Left views) Bilateral ear prominence in a 10 years old boy. (Right views): 6 months postoperatively.



Fig. 7: This view from below shows just how far out the ears protrudes before surgery (left view) and after surgery (right view).

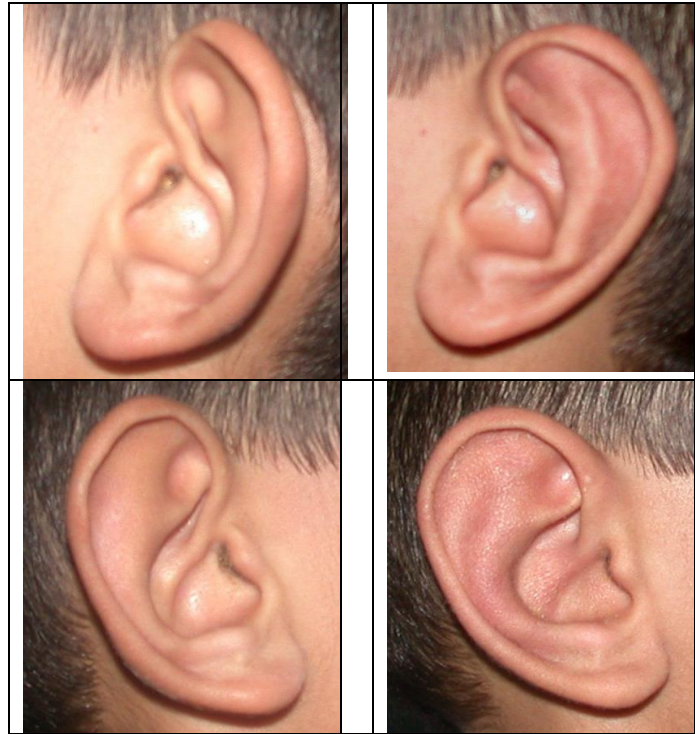


Fig. 8: close – up lateral views of both auricles of the same patient in fig 6&7 .Left views are preoperative. Right views: 6 months postoperatively.



Fig. 9: (Left views):12 years old boy with sever bilateral prominent ears. (Right views): 6 months after combined antihelix reconstruction and conchal repositioning.

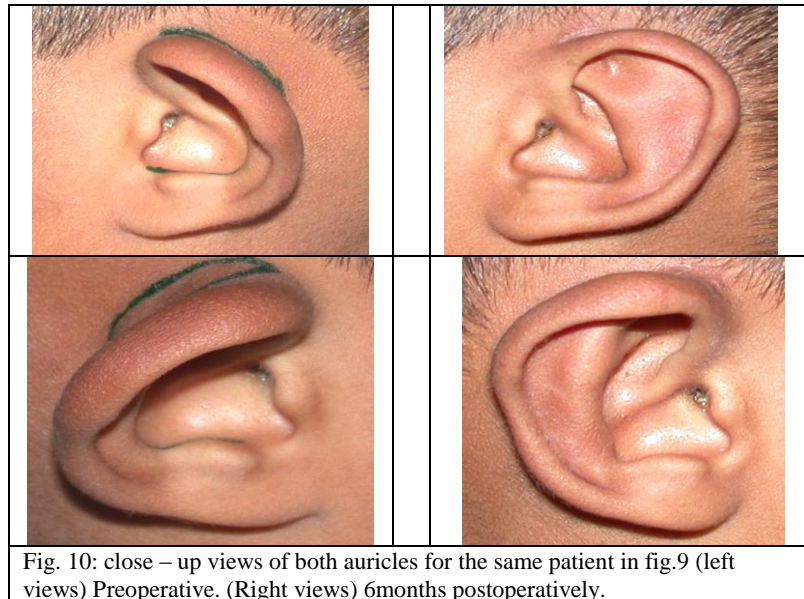


Fig. 10: close – up views of both auricles for the same patient in fig.9 (left views) Preoperative. (Right views) 6months postoperatively.

CONCLUSION :

Analysis of the cause of ear prominence is the single most important step toward selection of the proper treatment plan. Prone position under general anesthesia can be a good alternative to the usual supine position for otoplasty. Using needles for marking the site of Mustarde sutures appear to us more practical than marking with methylene blue dye. Toothed forceps found to be a good alternative when specific cartilage scorers are not available. Cartilage scoring with toothed forceps is appropriate for younger age group as well as in the older

age group when combined with proper Mustarde stitches. Multiple sutures (4 Mustarde and 2 conchal setback sutures) will balance the final outlook of the ear. Mild and moderate conchal hypertrophy is best treated with conchal setback alone while conchal reduction with setback is reserved for only the very deep concha. Patient and patient's family should understand that the goals of otoplasty are improvement, not perfection. Perfect symmetry is both unlikely and unnatural.

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