

Cartilage-sparing otoplasty: Our experience

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Abstract

Prominent ears are the most frequent congenital deformity in the head and neck area. Otoplasty has undergone important developments and numerous techniques have been employed to address the anatomical defects, namely the lack of antihelix and the overdevelopment of the concha. We present a cartilage-sparing technique involving scapha – conchal sutures insertion to recreate the antihelix, conchal setback and cartilage weakening. No cartilage is excised. Prior to creating the antihelix, the medial surface of the cartilage is superficially scored. Occasionally a tangential excision of the posterior prominence of the cartilage prior to the placement of set back sutures is employed for an excessively large conchal bowl. A series of 86 consecutive patients underwent otoplasty with this technique. According to our experience the described technique gives good and predictable long-term results with a natural-appearing ear. Significant complications are rare. In case of loss of correction, revisional surgery is straightforward on the intact pinna cartilage.

Key words: Ear, External; Abnormalities; Surgical Procedures, Operative

Introduction

Protruding ears are the most frequent congenital deformity in the head and neck area, and numerous techniques have been employed to address the anatomical defects and give the patient natural-looking ears with the minimum of morbidity.^{1,2} We studied 86 consecutive patients who underwent otoplasty for prominent ears with the same cartilage-sparing technique. The technique that we describe is a modification of the Mustarde technique^{3,4} with conchal setback as proposed by Furnas⁵ combined with weakening of the antihelical cartilage and concha as needed. The patients were followed up for a period up to five years.

Patients and methods

We studied retrospectively a series of 86 patients who underwent otoplasty for prominent ears with the same cartilage-sparing technique. This series includes 36 women, 41 men and nine children. The ages ranged from eight to 35 years with a mean age of 23 years. All but three had bilateral deformities consisting of varying degrees of underdevelopment of the antihelix and overdevelopment of the concha. The follow-up period ranged from 12 months to 5 years with a mean follow-up period of 20 months. The results were assessed on the 10th post-operative day, and also one month, six months and 12 months following otoplasty and when the patient was last examined.

Technique

The technique is individualized to the patient. The children are operated on under general anaesthesia while the adults are operated on under local anaesthetic. The worst ear is operated on first. A fusiform incision is made on the postauricular skin about a centimeter away from the sulcus. The amount of post-auricular skin to be excised is determined by manipulating the ear into the desired position and should be less than 1 cm. The auricular skin is undermined in the subcutaneous plane at the whole posterior auricular surface. Excision of post-auricular soft tissue is performed down to the mastoid periosteum to aid the conchal setback. Meticulous haemostasis is performed. The sites of the scapha – conchal sutures placement are marked with six needles (Figure 1). Superficial scoring along two lines formed by the needles is performed to weaken stiff auricular cartilage to permit the sutures to have an adequate result. The distance between the two lines should not be great lest the ear would look as though it were plastered to the head and the helix would not be seen beyond the antihelix from the front view. Full thickness incisions (as described by Converse,² Zaoli⁶ and other surgeons) or removal of cartilage is not employed. The most superior suture is placed first followed by two or three more permanent mattress sutures according to the Mustarde technique, placed through the medial perichondrium, the cartilage and the lateral perichondrium. Our suture preference is 3-0 Ethilon.

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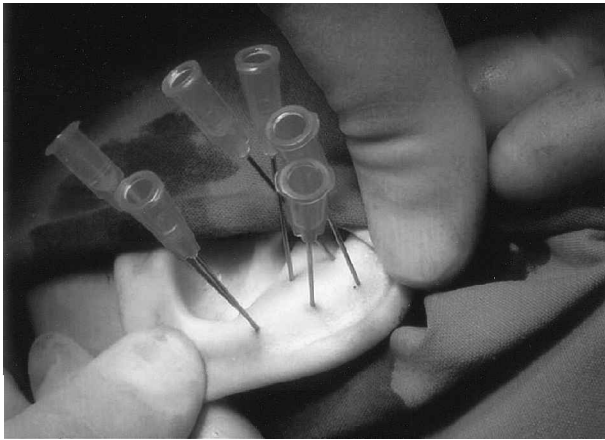


FIG. 1

The sites of the scapha – conchal sutures placement are marked with needles.

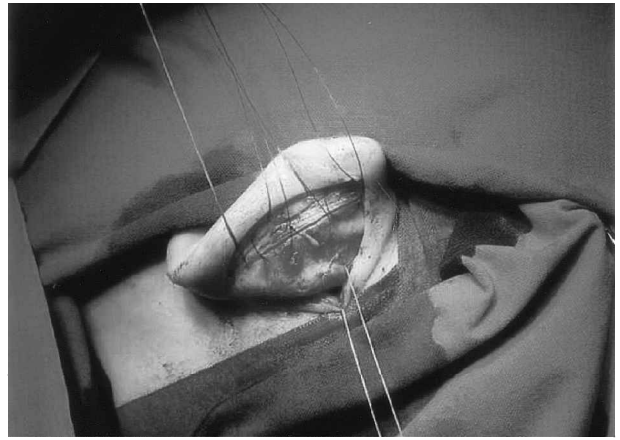


FIG. 2

Permanent mattress sutures according to the Mustarde technique, and concha-mastoid sutures as described by Furnas.

The sutures are all placed and snapped with a haemostat (Figure 2). They are tightened in the same order as they were placed. The sutures must be placed perpendicularly across the antihelical fold, so that upon tightening they will create a smoothly rounded antihelix. Slight overcorrection of the superior pole is recommended.^{1,7,8}

Then one to two 2-0 Ethibond permanent sutures are placed between the concha and the mastoid periosteum. In the occasional patient with a very thick conchal wall additional setback can be achieved by a tangential excision of the posterior prominence of the cartilage prior to the placement of setback sutures.^{1,7} The vector of pull of the sutures is in the superior and posterior direction to avoid collapse of the ear canal. Skin closure is performed with interrupted stitches. No drain is used.

A corticosteroid – antibiotic cream is applied generously to the ear. A firm mastoid type dressing is left intact for five days. The bandages are removed on the fifth post-operative day.

Results

In our series results were generally satisfactory (Figure 3). As otoplasty is an aesthetic operation the surgeon’s efforts are for the best possible

aesthetic outcome and the technique is individualized to meet patient preferences. Evaluation of the results was based on the criteria proposed by McDowell⁹ and Wright.¹⁰ The main goals of otoplasty and criteria to define a good result along with the results achieved in our series appear in Table I.

Subjective assessment was based on a satisfaction rating scale. The patients were advised to rate their satisfaction with the procedure and the result in a scale 1 to 5 (Table II), taking into account the parameters presented in Table III, a year following otoplasty and when last examined. Results were judged as satisfactory or very satisfactory by 81 out of 86 patients (94.1 per cent). Three patients experienced loss of correction necessitating revision surgery. One patient developed a keloid refractory to treatment. One patient with overcorrected ears desired further approximation of his ears to the head. He was discouraged from having revision surgery.

A small number of complications presented in this series, affecting eight patients (9.3 per cent). Three patients had revision surgery. Otoplasty in these cases was performed with absorbable sutures. Revision otoplasty was performed with permanent sutures and had good results. Two patients developed perichondritis. In one case the medical treatment was effective. The second patient was

TABLE I

THE GOALS OF OTOPLASTY AND CRITERIA TO DEFINE A GOOD RESULT. EVALUATION OF THE RESULTS OBTAINED IN OUR SERIES (86 PATIENTS)

Goals of otoplasty	No. of patients
1. From the front view, the helix of both ears should be seen beyond the antihelix.	83 (96.5%)
2. The antihelix should curve forward smoothly, without ridges, scars or buckles.	86 (100%)
3. The distance between the helical rim and the mastoid should be 15 mm to 20 mm. The auriculocephalic angle should be 25° to 35°.	83 (96.5%)
4. The post-auricular sulcus should be preserved.	85 (98.8%)
5. There should be symmetry in size, shape and position between the two ears.	83 (96.5%)

TABLE II

SATISFACTION RATING SCALE

1	2	3	4	5
Very dissatisfied	Unsatisfied	Moderately pleased	Satisfied	Very satisfied

TABLE III

PARAMETERS EVALUATED FOR SUBJECTIVE ASSESSMENT

1. Do the ears look normal or abnormal
2. Is there symmetry between the two ears of asymmetry
3. Are the ears protruding
4. Is the patient happy with the result
5. Would the patient undergo otoplasty again (knowing what it involves)



FIG. 3

(a) Pre-operative anterior full face view. (b) Post-operative anterior full face view. (c) Pre-operative lateral view. (d) Post-operative lateral view.

treated with surgical debridement and local application of a corticosteroid – antibiotic cream. No deformity of the ear occurred. One patient developed a keloid refractory to medical treatment, that recurred after the first excision. After a second excision and treatment of the keloid with triamcinolone no hypertrophic scar was noticed for nine months. Two patients presented with extrusion of the permanent sutures four and five years after the otoplasty with no loss of correction.

Discussion

A number of different techniques for otoplasty are described in the literature. Long-term follow-up has stressed the importance of critical review of clinical results using objective criteria along with patient subjective assessment.^{4,7,8} Although gratifying results can be obtained with most techniques, there is a potential for irregularities along the anterior surface when applying cartilage-incising techniques^{1,4,7} and wound contraction forces can cause unpredictable distortion long after the operation. The described technique is a modification of the Mustarde technique^{3,4} with conchal setback as proposed by Furnas⁵ combined with weakening of the antihelical cartilage and concha as needed. It

does not involve cartilage excisions or full thickness cartilage incisions.

Results were judged as satisfactory, or very satisfactory, by 81 out of 86 patients (94.1 per cent). Objective evaluation was in line with the patients' satisfaction rate. Otoplasty results are generally reported to be satisfactory in the literature.^{1,7,9,11} The subjective success rate is usually higher than the objective evaluation of the results.^{7,11} A reason for this could be the small distances proposed as suggested criteria (McDowell's evaluation criteria). The impact of the great variability of head size and shape, and ear size and shape, to the patient's subjective sense of ear shape and position should also be considered.⁷

A small number of complications presented in this series, affecting eight patients (9.3 per cent). These are similar to the results of cartilage-sparing otoplasty reported in the literature with reported complication rates of nine to 20 per cent.^{4,8} Loss of correction is a problem with most techniques. On long-term follow-up cartilage-sparing techniques have often been noticed to result in some loss of correction occasionally necessitating revision.^{4,7} This is attributed to cutting of the cartilage by these sutures. Adamson *et al.* using detailed measurements for a cartilage-sparing approach showed that some

loss of correction should be anticipated in most patients.⁸ There is usually a greater loss of correction of the upper pole and many surgeons suggest overcorrecting the upper pole. Suture complications are quite common. Most are managed conservatively with no associated loss of correction. Reported extrusion rates for permanent sutures are up to 20 per cent.^{7,8} The ideal suture should be easy to manipulate, nonabsorbable or retaining its tensile strength for several months and give minimal tissue reaction. Monofilament sutures are less prone to infection but they can slip or cut through and are associated with more frequent loss of correction.⁸ Infection and hypertrophic scars usually respond to medical treatment.

A firm head dressing is usually applied after otoplasty. Ears are bandaged post-operatively for splinting, protection and prevention of haematoma. Most surgeons leave the dressings for seven to 10 days⁴ although some others recommend a firm dressing for only 24 hours^{7,8} and the use of a headband at night for several weeks. One could comment that wound strength is still minimal after a week and the healing takes at least six weeks before a mature scar has formed. The ear bandage should be firm enough to splint the ears but not so tight as to cause discomfort or skin ulceration. Bandages are often displaced.

Conclusion

The described technique is a straightforward technique offering good and predictable long-term aesthetic results with a natural appearing ear. Serious complications are rare. Revision surgery is relatively easy on an intact cartilage.^{1,3,4}

References

- 1 Adamson PA, Strecker HD. Otoplasty techniques. *Facial Plast Surg* 1995;**11**:284–300
- 2 Pitanguy J, Fleming I. Plastische Eingriffe an der Ohrmuschel. In: Naumann HH, ed. *Kopf und Hals Chirurgie, Ohrregion* Band 3. Stuttgart: Georg Thieme Verlag, 1976;14–6
- 3 Mustarde JC. The correction of prominent ears using simple mattress sutures. *Br J Plast Surg* 1963;**16**:170–6
- 4 Bull TR. Otoplasty: Mustarde technique. *Facial Plast Surg* 1994;**10**:267–76
- 5 Furnas DW. Correction of prominent ears by concha – mastoid sutures. *Plast Reconstr Surg* 1968;**42**:189–93
- 6 Zaoli G. Technical devices in otoplasty. *Facial Plast Surg* 1997;**13**:197–205
- 7 Vuyk HD. Cartilage-sparing otoplasty: a review with long term results. *J Laryngol Otol* 1997;**111**:424–30
- 8 Adamson PA, McGraw BL, Tropper JG. Otoplasty: Critical review of clinical results. *Laryngoscope* 1991;**101**: 883–8
- 9 McDowell AP. Goals in otoplasty for protruding ears. *Plast Reconstr Surg* 1968;**41**:17–27
- 10 Wright WK. Otoplasty goals and principles. *Arch Otolaryngol* 1970;**92**:568–72
- 11 Bradbury ET, Hewison J, Timmons MJ. Psychological and social outcome of prominent ear correction in children. *Br J Plast Surg* 1992;**45**:97–100

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