Incisionless Otoplasty
A Reliable and Replicable Technique for the Correction of Prominauris

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IMPORTANCE This study evaluates the postoperative outcomes achieved with incisionless otoplasty for the correction of prominauris.

OBJECTIVE To determine whether incisionless otoplasty is a reliable and replicable technique in correcting prominauris.

DESIGN, SETTING, AND PARTICIPANTS This study consisted of a retrospective electronic medical record review for 72 patients undergoing incisionless otoplasty for the correction of prominauris by a single surgeon from November 2006 to April 2013. Follow-up ranged from 1 to 87 months. The patients were operated on at both St Joseph’s Health Centre (a community hospital) and The Cumberland Clinic (private practice) in Toronto, Ontario, Canada. All patients undergoing an incisionless otoplasty for the correction of prominauris were eligible. Participants’ ages ranged from 3 to 55 years, with the majority being adults. Seventy patients were followed up for outcomes.

INTERVENTIONS Incisionless otoplasty.

MAIN OUTCOMES AND MEASURES Number and type of sutures used, perioperative complications, and postoperative follow-up including complications and revisions. Complications included infection, hematoma, bleeding, perichondritis, suture granuloma, suture exposure, and suture failure.

RESULTS A mean (SD) 2.5 (0.8) sutures were used in the left ear, 2.48 (0.75) in the right ear, and 4.69 (1.75) in total. The number of sutures used in the left vs right ear was not significantly different (P = .60). All patients had horizontal mattress sutures placed for correction of prominauris. There were no serious perioperative complications such as infection, bleeding, hematoma, perichondritis, or cartilage necrosis. Follow-up data were extracted and analyzed in 70 patients, with a mean follow-up time of 31 months. Complications were seen in 10 patients (14%): 4 were due to suture failure, 3 were due to suture exposure, 2 were due to granuloma formation, and 1 was due to a Polysporin (bacitracin zinc/polymyxin B sulfate) reaction. Nine patients (13%) needed a revision to achieve a desirable result.

CONCLUSIONS AND RELEVANCE The technique of incisionless otoplasty used in this study was well tolerated and effective in both pediatric and adult patients, producing favorable outcomes with minimal complications. This procedure is less invasive than its open counterpart and seems at least equally effective in longevity.

LEVEL OF EVIDENCE 4.

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Incisionless Otoplasty

Methods

Medical Record Review

Institutional review board approval was obtained from St Joseph’s Health Centre. A retrospective electronic medical record review was conducted for 72 patients undergoing incisionless otoplasty for the correction of prominent ears by a single surgeon (A.G.) from November 2006 to April 2013 at St Joseph’s Health Centre and The Cumberland Clinic in Toronto, Ontario, Canada. Variables of interest included patient age at time of otoplasty, preoperative diagnosis and ear deformity type, unilateral or bilateral procedure, anesthetic used (local vs general), number and type of sutures used, perioperative complications, and postoperative follow-up including revisions and complications. Included in the definition of complications were infection, hema-

toma, bleeding, perichondritis, suture granuloma, suture exposure, and suture failure. Undercorrection or persistent deformity were considered unsatisfactory results. Statistical analysis was performed using Microsoft Excel 2010 version 14.0 (Microsoft Corp).

Surgical Technique

Patients are prepared and draped using a head drape, body sheet, and 2 adhesive ear drapes (Steri-Drape 1020; 3M Company). The pinnae are injected with lidocaine hydrochloride, 1%, with epinephrine, 1:200 000, obtaining proper blanching and distribution of the solution on the anterior and posterior aspects of the pinna and avoiding overinjection. A 22-G hypodermic needle is then used to percutaneously score the cartilage at the level of where the antihelical fold is to be recreated. Anywhere from 2 to 4 sutures (4-0 Ti-Cron [Covidien] or 3-0 Mersilene [Ethicon]) using a free curved needle (Regular Surgeons ½ Circle 1834-7D; Anchor Products Company) are then placed percutaneously following a Mustarde type of horizontal mattress suture to recreate the antihelical fold and reduce some of the conchal prominence (Figure 1 and Video). The first 32 patients in this series were operated on using Fritsch’s original technique, where 2 different sized needles are used and the suture breaches both the posterior and anterior surfaces of the pinna. The technique was then simplified to use only the larger of the 2 needles and avoid breaching the anterior surface of the ear. This simplified the technique significantly and made it quicker. A similar technique was later published by and nicely illustrated by Fritsch. When a conchomasto-

doid suture is required or a protruding ear lobe needs correction, we use the percutaneous technique described by Fritsch in 2009. When the procedure is completed, the ears are cleansed with sterile saline solution and dabbed with antibiotic ointment. In young children we place a light cotton wool and glycerine otoplasty dressing that is kept on for approximately 24 hours. Older children and adults have an athletic headband put on or no dressing at all. All patients are asked to use an athletic headband at night for 2 weeks and told they can wear it during the day if desired. Patients are followed up in the office in 1 week.
The number of sutures used in the left ear vs the right ear was in the left ear, 2.48 (0.75) in the right ear, and 4.69 (1.75) in total.

In terms of preoperative diagnosis and ear deformity, 65 patients were 18 years or younger (pediatric population), and the other 12 patients were older than 18 years (adult population).

In terms of sutures used, a mean (SD) of 2.5 (0.8) were used and Transcutaneous Placement. Strychowsky et al14 found the efficacy of the operation with over 10 years of follow-up in his data series.

Follow-up data were extracted and analyzed in 70 of the 72 patients. The range of follow-up was 1 to 87 months, with a mean (SD) follow-up time of 31.0 (29.5) months. Complications were seen in 10 of the 70 patients (14%): 4 were due to suture failure, 3 were due to suture exposure, 2 were due to small localized granuloma formation, and 1 was due to an allergic Polysporin reaction (resolved uneventfully in 1 week). No patients had over-correction or infection. Nine patients (13%) needed a revision to achieve the desired result. Of these, 7 were unilateral procedures and 2 required both ears corrected. Of the 9 revisions, 5 were performed with the use of local anesthesia. Only 4 patients had an incisionless otoplasty revision because of suture failure following an operation by the primary surgeon (A.G.); the rest were performed because of unfavorable results in terms of undercorrection. Of the 9 revisions, 1 required an open otoplasty to correct a fairly severe lop ear deformity that did not improve enough with the incisionless technique. Most of these revisions required only a single suture to improve the result. Two patients underwent incisionless otoplasty to revise a prior open procedure that was performed elsewhere. One patient underwent incisionless otoplasty to revise an incisionless operation performed in Germany. No patients needed more than 1 revision. Pretreatment and post-treatment photographs are shown for an adult patient (Figure 2), a pediatric patient (Figure 3), and a teenaged patient (Figure 4).

Discussion

This is the largest series to date that presents the results of incisionless otoplasty. It is also the first to include adult patients. This is an important difference in previous studies because, albeit less of a clinical issue, prominent ears are still undesirable for many adults. Incisionless otoplasty gives adult patients a chance to correct the ear deformities that were not managed at a younger age. Outcomes were favorable in the adult population, with only 1 patient needing a revision.

This study agrees with others in terms of pediatric outcomes after incisionless otoplasty. Strychowsky et al14 found few complications in their study of 19 pediatric patients, with none having signs of significant infection, hematoma, wound dehiscence, or skin necrosis. Revision rates were similar (10.5% vs 12.9%).14 Similarly, Fritsch15 has proven the efficacy of the operation with over 10 years of follow-up in his data series.
Figure 2. Adult Patient

Pretreatment (top row) and posttreatment (bottom row) views.

Figure 3. Pediatric Patient

Pretreatment (top row) and posttreatment (bottom row) views.

Figure 4. Teenaged Patient

Pretreatment (top row) and posttreatment (bottom row) views.
Incisionless otoplasty by this technique has proven to be effective in correcting prominenariaus caused by an absent antihelical fold, conchal hypertrophy, or both. The minimally invasive nature, easy recovery with no need for long-term dressings, and outpatient advantage of incisionless otoplasty makes it a more ideal option vs open otoplasty in cases where it is indicated. In teenagers, local anesthetic is typically used, and the patient can return home right after the procedure. In children, general anesthesia is more common, but outcomes are favorable and the postoperative course is rather uncomplicated. Open otoplasty features higher rates of early complications such as hematoma, perichondritis, postoperative pain and bleeding, skin necrosis, and wound infections, as well as later complications such as hypertrophic and keloid scars, ear deformities, hypoesthesia or paresthesia, recurrence of the deformity, and fistula formation in severe cases. None of these complications, except for recurrence of the deformity, were seen in this series. The only other complications were limited to suture exposure, topical dermatitis, and granuloma formation; the latter was found to have an 8% incidence in a study done by Adamson et al with the use of Mersilene sutures.

All patients in this series were treated with the use of Mustarde-type horizontal mattress sutures that allowed us to correct the principal deformity in our patients. The senior author (A.G.) has found that all mild and most moderate conchal hypertrophies can be addressed with properly placed sutures along the middle to lower aspects of the antihelical fold. The use of incisionless conchomastoid sutures has been reserved for extremely prominent conchal bowl hypertrophy. A number of different techniques to address ear lobe protrusion have been used by the senior author over the years, including skin excision, cartilage reshaping, and suture techniques. The senior author’s experience with the cauda helics suture and percutaneous cartilage release described by Fritsch is limited but encouraging.

The concept of revision in the present series of incisionless otoplasty warrants discussion. Nine patients underwent a revision to achieve their desired result. The ease of revision is an important factor, affecting the rate of follow-up procedures: 5 of the 9 patients were able to have this procedure under local anesthetic, and most required just a single suture. Patients are motivated to undergo a revision procedure because it can be done in a short period as an outpatient (often in an office setting) with minimal postoperative recovery, which is not the case when this procedure is done using cartilage cutting and scoring technique or when revising with an open Mustarde and Furnas technique. As a result, many patients who are slightly displeased by a perceived lack of symmetry, amount of correction, or recurrence of the deformity may find it easier to request and undergo another procedure. Another important motivating factor that increases the revision rate in our practice is that otoplasty is a fully insured service up to the age of 18 years in most of Canada.

Conclusions

Overall, the technique of incisionless otoplasty used in this study was well-tolerated and efficacious in both pediatric and adult patients, leading to favorable outcomes and minimal complications. It is an extremely versatile technique that can be applied for the correction of the majority of these types of ear deformities, with replicable and consistent results that are very natural looking and pleasing to both patients and surgeons. The senior author has found absolutely no difference in the longevity of the results when compared with his own open approach otoplasty patients. It is speculated that the cartilage scoring and ensuing inflammatory reaction and scar formation caused by the operation and suture placement help maintain the results in the long term.