OPEN

PRS GLOBAL OPEN

ORIGINAL ARTICLE
Cosmetic

Outcomes and Complications of the Mustardé Otoplasty: A "Good–Fast–Cheap" Technique for the Prominent Ear Deformity

Matthew L. Boroditsky, BHSc*
Aaron C. Van Slyke, MD, MSc*
Jugpal S. Arneja, MD, MBA, FAAP, FACS, FRCSC*†

Background: The Mustardé otoplasty is a commonly used procedure for the correction of the prominent ear deformity. Complication rates related to suture extrusion and long-term outcomes are variable in the literature. The study's purpose was to examine the efficacy and safety of the Mustardé otoplasty and its resource utilization, using an "iron triangle" methodology incorporating quality, time, and cost.
Methods: Retrospective data were collected on patients under 18 years who underwent primary Mustardé otoplasty between 2009 and 2018. Patient demographics, intraoperative details, complications, follow-up, and satisfaction were collected and analyzed.
Results: There were 119 Mustardé otoplasties performed on 68 patients, with a median follow-up of 72 weeks (24–476 weeks). In total, 51 of the 68 patients underwent bilateral procedures. The median operative time was 95 minutes (31–133 minutes), translating to a facility case cost of $2046. A total of 24 complications were reported in 17 patients. Minor complications included the following: suture extrusion (n = 20), hematoma (n = 1), and suture abscess (n = 1). Major complications included reoperation (n = 2). The series had a revision rate of 1.7% (n = 2). No additional procedures were documented at other hospitals in the province. The majority (97%) of ear outcomes demonstrated both patient and surgeon satisfaction.
Conclusions: The Mustardé otoplasty demonstrated a high efficacy in the correction of the prominent ear, with low reoperation rates and high patient and surgeon satisfaction. The procedure demonstrated intriguing results in resource utilization, with brief operative times, a "knife and fork" supply chain, and minimal overall case costs. This technique qualifies as a good, fast, and cheap outpatient otoplasty option. *(Plast Reconstr Surg Glob Open 2020;8:e3103; doi: 10.1097/GOX.0000000000003103; Published online 24 September 2020.)*

INTRODUCTION

Prominent ear is the most frequent congenital external ear deformity, affecting roughly 5% of the general population.[1–3] Although the deformity presents with no functional problems, the condition often has significant psychological and social impacts on the patient, especially in children.[4–6] As such, otoplasty has become one of the most common aesthetic operations in children and adolescents.[2,6,7]

Over 200 different otoplasty techniques have been described.[2,8] In general, these are grouped into cartilage-cutting and cartilage-sparing (suturing) techniques. The Mustardé technique is one of the most common cartilage-sparing techniques.[4,5] Mustardé sutures correct the prominent ear deformity by creating and securing an antihelical fold with 2–4 horizontal mattress fixation sutures.

The complication rate for cartilage-sparing techniques is in the range of 0.4%–24%, with a revision rate of approximately 13.6%.[2,9,10] Common complications reported in the literature include infection, bleeding/hematoma, pruritus, residual protrusion/asymmetry, and a number of complications associated with suture material (eg, palpability, visibility and extrusion).[2] Classically, the Mustardé technique has been associated with variable rates of suture

*From the *Division of Plastic Surgery, University of British Columbia; Vancouver, BC, Canada; and †Sauder School of Business, University of British Columbia, Vancouver, BC, Canada.*

Received for publication July 13, 2020; accepted July 21, 2020.

Presented at the Canadian Society of Plastic Surgeons 2020 Online Scientific Meeting.

DOI: 10.1097/GOX.0000000000003103

Disclosure: *The authors have no financial interest to declare in relation to the content of this article.*

extrusion, suture line granuloma formation, and relapsing deformity secondary to suture fatigue (0%–22.2%).[2]

In its simplest sense, surgery is a collection of resources (human, technology, equipment, physical plant, materials, etc.) utilized to produce a desired end result with associated outcomes. In the world of production, the ideal outcome is often a trade-off between good (quality), fast (time), and cheap (cost), with firms rarely achieving all 3.[11] In an era of fiscal prudence and cost control in healthcare, it behooves surgeons to look at these metrics when evaluating the outcomes of our interventions.

There are few recent data in the literature discussing the safety and efficacy of the Mustardé suture technique and its associated resource utilization. We hypothesize that the Mustardé suture technique has a lower complication rate than what has been historically reported, specifically with respect to reoperation and suture extrusion.[2,12] Herein, we present the senior author's (J.A.) experience with the Mustardé technique for otoplasty in the pediatric/adolescent population at a single institution and analyze these outcomes using a production lens.

METHODS

This study was designed as a 9-year retrospective review approved by the UBC Children's and Women's Research Ethics Board (H18-02577), with a granted waiver of consent.

Patients

Eligible patients were identified from the senior author's (J.A.) surgical database from May 20, 2009, to September 1, 2018. A consecutive series of patients who underwent a primary Mustardé otoplasty for prominent ear, including those with constricted or cup ear variations, by the senior author were included. Exclusion criteria were alternative otoplasty techniques (eg, cartilage cutting and rasping), patients lost to follow-up, or patients with less than 6 months postoperative follow-up.

Data Collection

Collected patient demographic information included patient's sex, age, and medical comorbidities. Operative data included original surgery date, age at the time of surgery, surgical indication, surgical procedure details (type of anaesthesia, suture material, number of Mustardé sutures placed with or without conchal bowl reduction, and operative time), and other procedures performed concurrently. Postoperative data consisted of reoperation rates, follow-up duration, and patient compliance with postoperative recovery regimen. Patient/family and surgeon satisfaction scores were retrieved when available and an outcome matrix was constructed (Personal Correspondence, Dr. R. Warren). Surgeon satisfaction was documented at the 1-year postoperative follow up visit. Satisfaction was based on the surgeon's impression of postoperative symmetry and residual prominence. Symmetry and residual prominence were assessed through comparison with baseline preoperative anatomic domains (upper third, middle third, and lower third). Satisfaction outcomes from the patient/family were primarily through a formal discussion documented in the chart outlining their satisfaction with the final postoperative results. Both satisfaction scoring systems were based on retrospective chart reviews and not validated in the literature. Patient charts were reviewed for minor and major complications, time of presentation (early ≤14 days or late >14 days postoperatively), and outcomes of complication (eg, self-limiting/outpatient management or requiring reoperation). Follow-up information was obtained from the office charts as well as our provincial electronic health record system to capture any additional follow-up performed by other providers in the province postoperatively. Postoperative consultations were performed at 1 week, 3 months, and 1 year. Complications and subjective surgeon and patient satisfaction scores were used as measures to assess Mustardé otoplasty safety and efficacy profiles, respectively. We divided complications into major and minor categories in addition to identifying the time of occurrence, with early and late distinctions. Minor complications were defined as self-limiting occurrences that did not require additional aggressive intervention and were managed on an outpatient basis. Major complications included reoperation and readmission. The operative records were reviewed to determine skin-to-skin surgical and anesthesia time; these data were extrapolated to determine a case cost, using previously defined bottom-up microcosting results for our institution.[13]

Surgical Technique

All patients had surgery performed under general anesthesia, with perioperative antibiotic prophylaxis and local anesthesia with epinephrine administered. Patients were prepared and draped to maintain bilateral ear exposure (Fig. 1). An elliptical skin excision was made on the posterior surface of the ear to access the underlying cartilage. The retroauricular elliptical incision was made for 2 reasons. First, to allow adequate dissection and exposure of the underlying perichondrium and access to the conchal bowl if a reduction was needed. Specifically, the incision extended superiorly to allow sufficient cartilage exposure in the upper helix and triangular fossa. This allowed for precise conchoscaphal and/or concho-fossa triangularis suture guide point placement for antihelical fold correction. Second, we prefer a mid-auricle ellipse to avoid potential synechiae at the sulcus. The skin excision does little to shape the ear; however, because of the reduction of prominence, there often is skin redundancy and thus it is reduced. The posterior surface was skeletonized, exposing the underlying perichondrium (Fig. 2). Prominent posterior auricular muscles were divided with electrocautery at the depth of the sulcus. Conchal bowl reduction was performed at this stage in the operation for indicated ears.

Next, Mustardé sutures were placed. Suture guide points were marked in the nadir of the scapha or fossa triangularis and opposite nadir of the conchal cartilage with a 25-gauge needle to guide recreation of the antihelical fold (Fig. 3). Two to three 4-0 clear nylon conchoscaphal and/or concho-fossa triangularis horizontal mattress sutures were placed and secured under appropriate tension to replicate a symmetric degree of natural ear

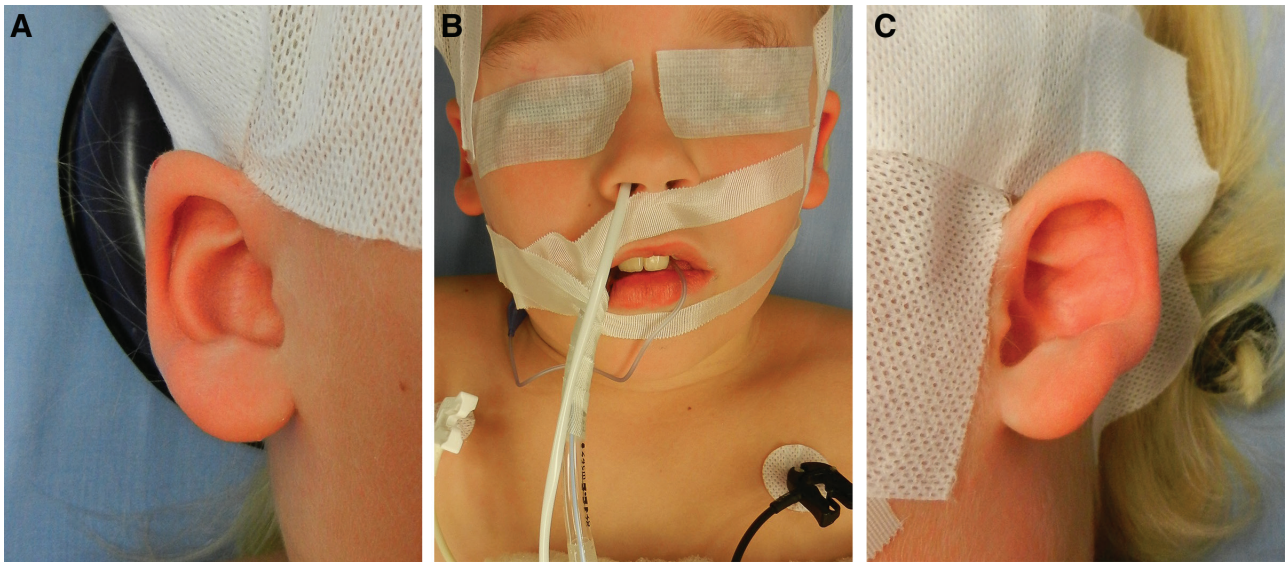

Fig. 1. Left unilateral prominent ear deformity, note effaced antihelical fold; for left otoplasty. A, Right ear. B, Full face view. C, Left ear.

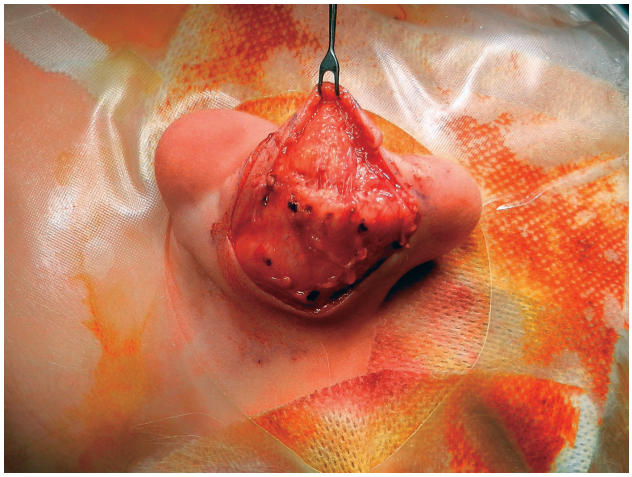

Fig. 2. Photograph showing an elliptical skin incision of the ear followed by skeletonization, exposing the perichondrium.

protrusion and antihelical fold correction (Fig. 4). Skin was closed with 4-0 Polyglactin 910 running sutures. The head was wrapped for the first week and a protective headband was worn for 2 months postoperatively, with a graduated return to sports and avoidance of trauma during this interval were instructed.

Statistical Analysis

Study data were analyzed using descriptive statistics. Demographic data and study outcomes are tabled and presented as counts and percentages. Operation characteristics were calculated and summarized as counts, percentages, and medians with interquartile ranges.

RESULTS

Demographics

As shown in Table 1, 68 patients met inclusion criteria over the 9-year study period. There were 25 males (37%)

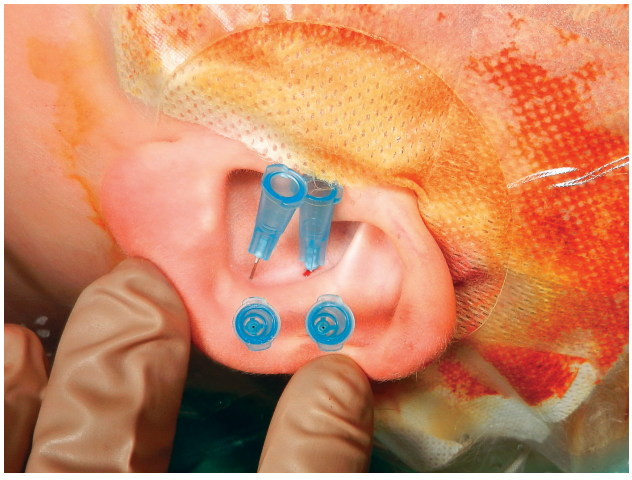

Fig. 3. Image displaying suture guide points marking nadir of scapha and conchal cartilage.

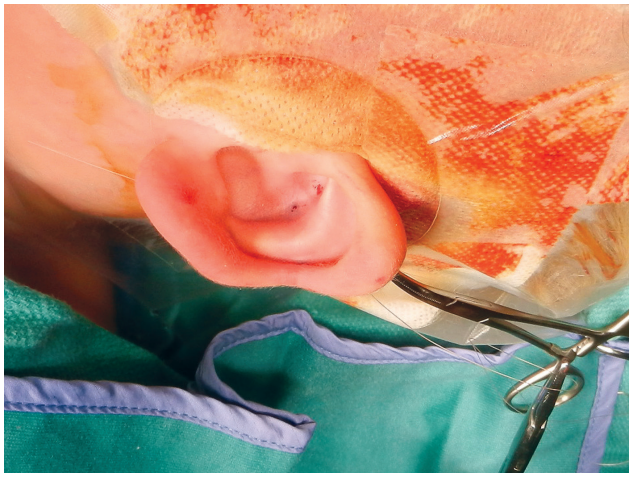

Fig. 4. Image showing the reconstruction of an antihelical fold using 4-0 clear nylon chonchoscaphal Mustardé mattress sutures.

Table 1. Patient Demographics

Patient Characteristics	N = 68	Number (%)
Gender	Male	25 (37%)
	Female	43 (63%)
Age at surgery	Median age in years (range, 2–17)	9 (NA)
Comorbidities	Syndromic (Turners, Russell-Silver, Duane)	4 (6%)
	Nonsyndromic	64 (94%)
Unilateral: Bilateral	Unilateral	17 (25%)
	Bilateral	51 (75%)

and 43 females (63%). Fifty-one (75%) patients underwent bilateral otoplasties. A total of 119 Mustardé otoplasties were performed in 68 patients. The median age at surgery was 9 years (range, 7–13), with no differences between sexes. In our patient cohort, 4 patients (6%) had comorbid syndromes.

Operative Details

Table 2 outlines the procedural details. Over the study period, 20 Mustardé otoplasties and 99 Mustardé otoplasties with a conchal bowl reduction were performed. The majority were for prominent ear deformities alone (n = 110), with the remaining operations being performed for constricted or cup ear deformities (n = 9). There was a median of 2 (range, 1–4) 4-0 clear nylon sutures placed per ear. The median operative time was 95 minutes (range, 31–133 minutes), with 48 minutes (range, 39–62 minutes) for unilateral procedures and 93 minutes (range, 75–104 minutes) for bilateral procedures. Patients were followed for a median of 72 weeks (range, 24–476 weeks). No additional surgical procedures or consultations were documented outside the senior author's practice upon review of the provincial electronic health record.

Outcomes

As shown in Table 3, the overall complication rate was 20% (24 of 119 ears). These complications were reported across 17 patients. There were a total of 22 minor complications, with 1 early suture extrusion and 21 late complications: suture extrusion (n = 19), hematoma (n = 1), and suture abscess (n = 1). There were a total of 2 major complications, both reoperations secondary to postoperative suture extrusion in 1 case and residual ear prominence after suture failure in the other case. Other complications were considered (ie, infection, keloid formation, pain, dysesthesia, skin necrosis, etc.); however, none were identified

Table 2. Operative Characteristics

Operative Characteristics	Mustardé (N = 20)	Mustardé and Conchal Bowl Reduction (N = 99)	Total (N = 119)
Deformity/indication			
Cup/constricted ear	3	6	9
Prominent ear	17	93	110
Operation characteristics			
Operation time, min	64 (31–107)	95 (31–133)	95 (31–133)
No. sutures placed	2 (1–4)	2 (1–4)	2 (1–4)
Follow-up time, wk	136 (28–476)	72 (24–476)	72 (24–476)

Data are presented as n or median (range).

Table 3. Outcomes

Outcomes	No. Cases (n)	Proportion of Cases, %
Minor complications	22	18.5
Suture extrusion	20	16.8
Hematoma	1	0.8
Suture abscess	1	0.8
Infection	0	0
Hypertrophic scarring	0	0
Pruritus	0	0
Dysesthesia/hypersensitivity	0	0
Chondritis	0	0
Skin necrosis	0	0
Major complications	2	1.7
Reoperation*	2	1.7
Readmission	0	0

*Reoperation due to suture extrusion and asymmetry postsuture failure.

in our cohort (Table 3). The senior author did not note any postoperative secondary deformities in our cohort (eg, telephone ear deformity). In total, 15 (75%) of the 20 suture extrusions were managed by suture removal in the office setting. A median follow-up time of 104 weeks (range, 98–187) was noted specifically for the suture extrusion group. Upon subgroup analysis of the data, conchal bowl reduction, age at time of surgery, number of sutures placed, or underlying syndromic presentation were not of any trend or significance within the study's primary outcome metrics, complication rates, and satisfaction.

Satisfaction scores were determined by a retrospective chart review. After eliminating the 13 ears without satisfaction scores, a denominator of 106 ears was utilized when reporting satisfaction percentages within our cohort. Overall, 103 (97%) of reported ear outcomes demonstrated both patient and surgeon satisfaction. Two ears (2%) exhibited patient satisfaction with surgeon unsatisfied, there were no cases of patient unsatisfied and surgeon satisfied, and finally 1 case of unsatisfaction among both the patient and surgeon (Table 4).

Costs

All facility costs associated with per minute use of an operating room (nursing, supply, equipment, property, plant) were calculated using a bottom-up microcosting model. These costs were obtained from our hospital's department of finance and were estimated in Canadian dollars.[13] These costs did not include physician compensation costs (Anesthesia, Surgery). Intraoperative time data consisted of skin-to-skin surgical time plus anesthesia time, but not turn-around-time. Cost estimates for a unilateral otoplasty were $1056 CAD and for a bilateral otoplasty $2046 CAD (Table 5).

Table 4. Surgeon and Patient Satisfaction

	Patient Satisfied	Patient Unsatisfied
Surgeon satisfied	97% (n = 103)	0% (n = 0)
Surgeon unsatisfied	2% (n = 2)	1% (n = 1)

Satisfaction not recorded in n = 13 ears (outcome measure described here in Table 4 developed by Dr. Richard Warren, unpublished).

Table 5. Case Cost

	Time, mins	Cost/Minute	Total Cost
Unilateral	48	$22	$1056 CAD
Bilateral	93	$22	$2046 CAD

Bottom-up microcosting methodology, not including physician (surgeon, anesthesia) compensation.

DISCUSSION

Otoplasty techniques can be largely grouped into cartilage cutting and cartilage sparing. Cartilage-sparing techniques are most frequently reported in the literature as the technique of choice in patients with mild to moderate antihelical deformities.[10,14] This technique yields precise operational control for the surgeon without permanently changing the cartilaginous structure.[2]

Outcomes

Overall, the literature is still conflicted on the direct comparison between cartilage-sparing and cartilage-cutting techniques over a variety of parameters. Cartilage-sparing techniques are growing in popularity, with their ability to reduce major early complications, increase postoperative patient and family satisfaction,[10,12] and provide more surgical control without permanently altering the inherent structure of the cartilage.[2] Specifically, they have been shown to utilize less soft tissue degloving and exposure, lowering the risk of postoperative hematoma and subsequent infection.[5,15] When analyzing the 2 techniques head-to-head, some studies demonstrate cartilage-sparing and cartilage-cutting techniques having comparable complication rates of roughly 20% and revision rates of 7% and 6%, respectively.[12] Other studies demonstrate differing revision rates between the 2 surgical categories (10% for Congchet and 2.9% for Mustardé).[5] Alternatively, when comparing postoperative satisfaction, cartilage-sparing techniques demonstrate higher overall satisfaction rates than cartilage-cutting techniques.[12]

When looking specifically at the Mustardé otoplasty and the complications rates associated with the procedure,[2,5,12] our rates compare favorably with these in the literature, including infection 0%–15%, average 1.13% (0%); hypertrophic scarring 1%–2%, average 1.36% (0%); pruritus 4% (0%), dysesthesia/hypersensitivity 3.4%–20%, average 14.7% (0%); and hematoma/bleeding 0%–33%, average 3.6% (0.84%). Late complications of the Mustardé otoplasty include suture extrusion 0%–22.2%, average 5.55% (16.8%); and revision 3%–24%, average 8.10% (1.7%).

Managing Suture Extrusion

With the increased utilization of cartilage-sparing otoplasty techniques as routine procedures, the ability to circumvent complications associated with suture extrusion has become a topic of discussion in the literature. Postauricular adipofascial flaps have been described to provide additional soft tissue coverage of Furnas and Mustardé sutures.[1,4,14] Horlock et al[16] and Irkoren et al[17] did not report any suture extrusion events following the use of postauricular adipofascial flaps in 51 and 100 cases, respectively. However, other studies have tried to replicate these findings, with suture extrusion and recurrence rates of 2.64%[14] and 4.8%,[18] respectively. To date, the literature remains divided and demonstrates a variety of heterogeneous results in regard to suture complications and revision rates. In general, reported suture complication rates with the adipofascial flap ranged from 0% to 7.3% and revision rates from 3.6% to 8.9%. Although these numbers provide a glimpse into a possibility of reducing suture-related complications, they add a layer of invasiveness and complexity to the procedure that may not be necessary to demonstrate a significant overall rate reduction. Our results demonstrate that the Mustardé otoplasty can have low suture extrusion (16.8%) and reoperation rates (1.7%) with high postoperative satisfaction (97%) without the use of adipofascial flaps.

Our suture extrusion rate of 16.8% falls within the range described in the literature; however, remains slightly higher than average rates reported. This may be secondary to prolonged follow-up times in our study, as our median follow-up time of 104 weeks (range, 98–187 weeks) in the suture extrusion group exceeds the median follow-up of 52 weeks (range, 26–52 weeks) across what is seen in the literature.[2,12] This prolonged follow-up time may capture more suture extrusion events throughout the study timeline. Second, the higher suture extrusion rates seen in this study may be attributed to the use of nonabsorbable suture material, which has previously been reported.[2] Nevertheless, given our ability to effectively correct and manage suture extrusions with high success rates through minor procedures (we wait until a full 12-months postoperatively before removing extruded sutures), we accept the risk that may accompany the use of nonabsorbable sutures to achieve a significantly lower overall recurrence and revision rate.

Resource Utilization

The goal to achieve a "good (quality)–fast (time)–cheap (cost)" outcome exists as a strategic mantra in production, known as the *iron triangle*.[11] At its foundation exists the inherent paradox of developing a highly safe and efficacious product, while maintaining cost-effectiveness and efficient resource utilization. The Mustardé otoplasty yields a substantially low revision rate, with high patient and surgeon satisfaction, while operative facility resource consumption is minimal, requiring a median operative time of 95 minutes as an outpatient procedure, few reoperations, and low case costs ($1056 and $2046). The need for fiscal accountability in health care treatment paradigms is paramount and should not be overlooked in comparative analysis of surgical procedures. Here we presented a general overview on the Mustardé otoplasty's resource utilization; however, a formal a cost–benefit analysis may be an area for future investigation.

Revision Rates

Our revision rate of 1.7% is below the reported rate in the literature for the Mustardé otoplasty and cartilage-sparing techniques as a whole. We believe this can be attributed to the consistent adherence to postoperative recovery regimens (headband usage and trauma avoidance for 8 weeks) and suture-related complications that

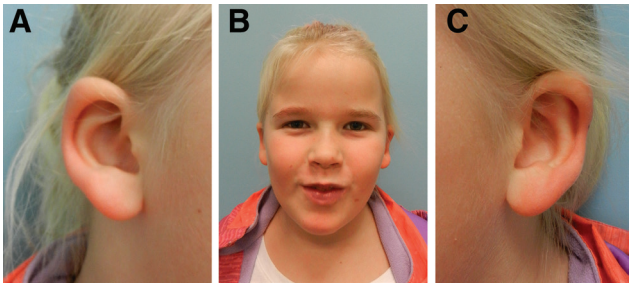

Fig. 5. One year postoperative left unilateral Mustardé otoplasty for patient in Figures 1–4. A, Right ear. B, Full face view. C, Left ear.

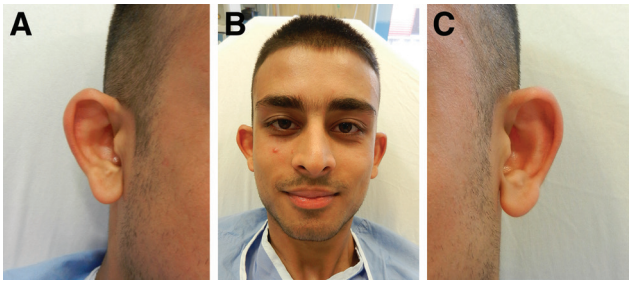

Fig. 6. Bilateral prominent ear deformity, with the right ear being more severe than the left; for bilateral otoplasty. A, Right ear. B, Full face view. C, Left ear.

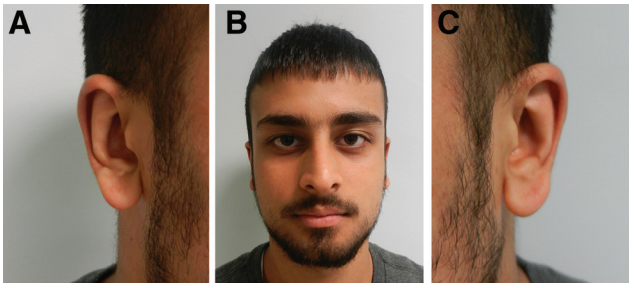

Fig. 7. One year postoperative bilateral Mustardé otoplasty for patient in Figure 6. A, Right ear. B, Full face view. C, Left ear.

were routinely and easily correctable as outpatient minor procedures (Fig. 5–7). Our study demonstrates that the Mustardé otoplasty is a safe and efficacious procedure that does not warrant any procedural alterations at this point in time. The utilization of nonabsorbable suture material may be a future area of investigation to assess its correlation with suture-related complications.

Limitations

We did not compare this technique to any control cohort and we did not use any formal tool for patient-reported outcomes; however, our incorporated outcomes of both patient and surgeon satisfaction remain important. Our major and minor classification criteria have not been standardized in the otoplasty literature. Finally, our cost analysis deliberately excluded physician costs since depending on a patient's insurance plan, this procedure may be an included benefit.

CONCLUSIONS

The Mustardé otoplasty demonstrated a high overall efficacy in the correction of prominent ear deformity in the pediatric and adolescent population. Specifically, the procedure had low reoperation and complication rates compared with the literature, and positive overall aesthetic outcomes. The procedure demonstrated negligible early complications, such as hematoma or infection. Long-term complications, specifically related to suture extrusion, were easily managed at >1-year postoperatively. The Mustardé otoplasty technique remains a leader amongst otoplasty procedures described in the literature in regard to efficacy/safety profiles, postoperative complications, satisfaction scores, and overall resource utilization, with brief operative times, a "knife and fork" supply chain, and minimal overall case costs, indeed proving to be a good, fast, and cheap option for treatment of the prominent ear.

Jugpal S. Arneja, MD, MBA, FAAP, FACS, FRCSC
Division of Plastic Surgery
University of British Columbia
British Columbia Children's Hospital
K3-131 ACB, 4480 Oak St.
Vancouver, BC V6H 3V4
E-mail: jugpal.arneja@ubc.ca

PATIENT CONSENT

Patients provided written consent for the use of their images.

REFERENCES

1. Albacete Neto A, Ungarelli LF, Coltro PS, et al. Does postauricular fascial flap reduce suture complications in otoplasty? *J Plast Surg Hand Surg.* 2018;52:225–228.
2. Limandjaja GC, Breugem CC, Mink van der Molen AB, et al. Complications of otoplasty: a literature review. *J Plast Reconstr Aesthet Surg.* 2009;62:19–27.
3. Ungarelli LF, de Andrade CZ, Marques EG, et al. Diagnosis and prevalence of prominent lobules in otoplasty: analysis of 120 patients with prominent ears. *Aesthetic Plast Surg.* 2016;40:645–651.
4. Basat SO, Ceran F, Askeroglu U, et al. Preventing suture extrusion and recurrence in Mustardé and Furnas otoplasties by using laterally based postauricular dermal flap, long-term results. *J Craniofac Surg.* 2016;27:1476–1480.
5. Punj P, Chong HP, Cundy TP, et al. Otoplasty techniques in children: a comparative study of outcomes. *ANZ J Surg.* 2018;88:1071–1075.
6. Braun T, Hainzinger T, Stelter K, et al. Health-related quality of life, patient benefit, and clinical outcome after otoplasty using suture techniques in 62 children and adults. *Plast Reconstr Surg.* 2010;126:2115–2124.
7. Kelley P, Hollier L, Stal S. Otoplasty: evaluation, technique, and review. *J Craniofac Surg.* 2003;14:643–653.
8. Janis JE, Rohrich RJ, Gutowski KA. Otoplasty. *Plast Reconstr Surg.* 2005;115:60e–72e.
9. Sadhra SS, Motahariasl S, Hardwicke JT. Complications after prominent ear correction: a systematic review of the literature. *J Plast Reconstr Aesthet Surg.* 2017;70:1083–1090.
10. Szychta P, Stewart KJ. Comparison of cartilage scoring and cartilage sparing techniques in unilateral otoplasty: a ten-year experience. *Ann Plast Surg.* 2013;71:522–527.
11. Atkinson R. Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. *Int J Proj Manag.* 1999;17:337–342.

12. Smittenberg MN, Marsman MS, Veeger NJGM, et al. Comparison of cartilage-scoring and cartilage-sparing otoplasty: a retrospective analysis of complications and aesthetic outcome of 1060 ears. *Plast Reconstr Surg*. 2018;141:500e–506e.
13. Malic C, Verchere C, Arneja JS. Inpatient silver sulphadiazine versus outpatient nanocrystalline silver models of care for pediatric scald burns: a value analysis. *Plast Surg (Oakv)*. 2014;22:99–102.
14. Sinha M, Richard B. Postauricular fascial flap and suture otoplasty: a prospective outcome study of 227 patients. *J Plast Reconstr Aesthet Surg*. 2012;65:367–371.
15. Pawar SS, Koch CA, Murakami C. Treatment of prominent ears and otoplasty. *JAMA Facial Plast Surg*. 2015;17:449.
16. Horlock N, Misra A, Gault DT. The postauricular fascial flap as an adjunct to Mustardé and Furnas type otoplasty. *Plast Reconstr Surg*. 2001;108:1487–1490; discussion 1491.
17. Irkoren S, Kucukkaya D, Sivrioglu N, et al. Using bilaterally fascioperichondrial flaps with a distal and a proximal base combined with conventional otoplasty. *Eur Arch Otorhinolaryngol*. 2014;271:1389–1393.
18. Mandal A, Bahia H, Ahmad T, et al. Comparison of cartilage scoring and cartilage sparing otoplasty—a study of 203 cases. *J Plast Reconstr Aesthetic Surg*. 2006;59:1170–1176.