

and Mustardé stitches, and closing sutures were recorded. Complications were evaluated during the 1 year follow-up, including wound dehiscence, haematoma, infection, exposed sutures, recurrence and keloids. As regards statistical analysis, χ^2 -test was applied to compare complication incidence with the two different surgical techniques utilized. No ethical approval was required for the performance of this retrospective case series review. Consent to submit has been received explicitly from all coauthors, as well as from the Head of the Paediatric Plastic Surgery section of our institution. Informed consent was obtained from all patients before taking pictures of them.

Surgical technique

All operations were performed under general anaesthesia. An injection of bupivacaine with adrenalin was applied in the posterior side of the ear 15 min before the surgery.

Modified-Mustardé technique

First, an hourglass-shaped incision was made behind the ear, marking a minimal skin resection area. Cartilage was exposed through a subperichondrial plane. When necessary, cartilage resection and cartilage weakening with a rasp or cartilage scoring with a scalpel were performed. Cartilage weakening was made from a posterior approach, without performing new incisions. Three needles were passed to mark the desired shape of the antihelical fold and the locations where sutures would be placed. Three Mustardé mattress sutures were applied with 4.0 Prolene stitches for antihelical fold marking. Conchal setback sutures were utilized in cases with important ear separation. A simple continuous suture with 5.0 Monosyn (Braun; Barcelona, Spain) was utilized for wound closure.

Modified-Furnas technique

An hourglass-shaped incision was made behind the ear, marking an extensive skin resection area. Cartilage was exposed through a subperichondrial plane. When necessary, cartilage resection, cartilage weakening with a rasp or cartilage scoring with a scalpel were performed. Cartilage weakening was made from an anterior approach, through a new incision hidden under the helix. Two Furnas sutures (conchal setback sutures) with 4.0 Prolene were applied. No Mustardé sutures were utilized. A simple continuous suture with 4.0 Vycril rapid (Ethicon; Madrid, Spain) was utilized for wound closure.

After each of both techniques, celestoderm-soaked gauzes were placed in order to support the newly shaped area and control early postoperative bleeding and swelling. Dry gauzes were placed over the ear, and covered with a compressive headband. After the second day, the patients were allowed to take gauzes out and clean their wounds on a daily basis. Headbands were utilized for 3 weeks. Antibiotic was only administered during the surgery, no antibiotics were provided after surgery.

Results

In all, 188 patients underwent otoplasty in our Paediatric Plastic Surgery Department, of which 85 were men and 103 were women. Their age ranged from 6 to 15 years (average: 9.97 years). Primary surgery was performed in

168 patients, with 20 cases of secondary surgery from which 11 patients had been operated in our service, and nine at a different centre; 168 patients underwent bilateral otoplasty and 20 unilateral correction, resulting in 356 ears operated (Table 1). One hundred and five patients underwent modified-Mustardé otoplasty, and 83 were operated utilizing the modified-Furnas technique. As regards complications, our results are listed in Table 2. The two cases of local infection were treated by abscess drainage and oral antibiotics, requiring unilateral revision otoplasty in one case. Keloids were treated with serial intralesional triamcinolone infiltrations, requiring surgical excision in one case. No statistically significant differences were found in complication rates among the two surgical techniques. According to McDowell's criteria for the evaluation of otoplasty success [7], our success rates were 93% (98/105) in primary surgeries performed with the modified-Mustardé technique; 90% (75/83) with the modified-Furnas technique; and 100% in all secondary surgeries (Table 3).

Discussion

Numerous surgical techniques have been described to treat prominent ear deformity, generally divided into cartilage-cutting, cartilage-scoring and cartilage-sparing

Table 1 Demographic data

Demographics	
Sex	
Male	85
Female	105
Race	
Caucasian	186
Asian	2
Ears operated	356
Bilateral surgery	168
Unilateral surgery	20
Primary surgery	168
Secondary surgery	20

Table 2 Summary of complications

Complications	Modified Mustardé [n (%)]	Modified Furnas [n (%)]	P
Wound dehiscence	3 (6)	2 (4)	0.85
Recurrence	7 (13)	4 (7)	0.59
Keloid	4 (7)	4 (7)	0.73
Infection	1 (2)	1 (2)	0.86
Suture extrusion	8 (15)	6 (11)	0.88
Haematoma	0	0	–

Table 3 Ear anomalies and techniques performed

Variables	n = 188
Antihelix absence	
Mustardé	83
Furnas	51
Antihelix absence + conchal hypertrophy	
Mustardé + conchal resection	22
Furnas + conchal resection	32
Revision surgery	
Cartilage and skin resection	2
Mustardé sutures	5
Furnas sutures	9
Mustardé + Furnas sutures	4

techniques [8]. Notwithstanding, none of them has proven to be better than the rest in terms of complication or success rates. Thus, the choice of technique remains subject to surgeon preference [1].

Our experience led us to utilize techniques that combine cartilage-sparing techniques with cartilage-weakening procedures. Stiff and thick cartilage resists reshaping by the use of Mustardé sutures alone. In fact, relapse rates of nearly 100% have been reported when the cartilage is more than 3.1 mm thick in the triangular fossa [9]. Weakening cartilage with anterior scoring induces forming of a fibrocartilaginous cap that stabilizes the neoantihelix in its new position [10]. Moreover, by performing Mustardé or Furnas sutures in conjunction with anterior scoring, less aggressive scoring is required. The combination of both techniques allows control over the long-term result, avoiding the need for purposeful overcorrection and undercorrection [1].

In our study, none of the evaluated techniques showed better results than the other, in terms of complications or success rates. Both complications and success rates reported in our series rates coincide with the rates reported in the literature with the performance of other techniques [1,6]. No relation has been found between the suture material used and keloid formation, nor between the sutures used for closure and dehiscence rates.

Conclusion

Success rates in prominent ear correction surgery are elevated in experienced hands. In our study, the performance of a

modified-Mustardé otoplasty technique showed similar results in terms of complications incidence and success rates than a modified-Furnas technique in a paediatric population. More studies with more extensive representation of different otoplasty techniques, and higher patient samples are required in order to clearly define the best otoplasty procedure among the existing ones.

Conflicts of interest

There are no conflicts of interest.

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