

1 Year Post Otoplasty Keloid Formation (Unconventional Complication Due to Wearing Ear Loop Facial Masks in Sars-Cov 19 Era)

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ABSTRACT

Following otoplasty procedure is quite uncommon to have a keloid formation. During a normal scar process, it is possible to have an alteration in the hypertrophic or keloid form during the first phase of healing process, which is the first two-three months. Keloid is due to an unbalance of the Collagen II/I ratio and differs from hypertrophic scar because it grows over the margin of the scar itself. It could be caused from an external force applied to the scar or from a dysregulation of the microbioma of the skin. To treat keloid scars, compression taping or corticoid injection could be applied. When those treatments aren't sufficient another modality is to excise the keloid and redoing the suture without tension on the scar borders. We present a peculiar bilateral and almost symmetric keloid formation on a patients underwent an otoplasty that developed a keloid after starting to use an ear-loop face mask around one-year post-op. We describe the case and our approach; we propose a post operative management in otoplasty patient during the Covid era to avoid the problems due by the frequent use of protective facial masks.

Keywords: Keloid; Otoplasty; The pillars concept; COVID complication; Skin friction; Skin management

INTRODUCTION

Prominent ears occurs in 5 % of the Caucasian population.^[1] In most cases is due to undeveloped antihelical fold or to excess of conchal cartilage. This cosmetics abnormalities has a high psychological and aesthetic impact on the patients and for that reason the right operative time should be as soon as possible or not more than pre-scholar phase. At this age the growing process is almost completed but there is still an easily pliability of the cartilage, and is it possible to avoid the psychosocial impact of the deformity. Otherwise, there are several cases who decide to proceed with the surgery in an adult age.^[2,3] The technique that we adopted in the majority of cases is the Pillar technique, described by the Senior Author in a precedent article.^[4] To define the anti-helical fold a Mustardè-like technique was performed.^[11] This method has a low percentage of complications and the post auricular incision consent to hide the scar. The most common complication is a protruding suture behind the ear with or without infection, which can occur in a small percentage of cases if a non-absorbable suture is used to define the anti-helical fold (<5% of the cases in our series) followed by localized cellulitis (1,2%), otohematoma (0.8%) and

hypertrophic scar (0,7%). Analyzing the literature and focusing on the hypertrophic scar and keloid formation, in particular the percentage are the same to our casistic and differs from the Fitzpatrick skin type (3% in total population, 11% in black patients and 2,1% in white patients) ^[5], and generally shown after a 6 month follow up. Several studies are made about Keloid formation and the clear pathogenesis is not fully understood. The main theory is that depend to an unbalance between the Collagen II/I ratio which in normal skin is 4:1 and in hypertrophic scar is inverted, 2:1 and in keloid reach 1:3.^[6] Hypertrophic scar and keloid have the same histopathological characteristics, an accumulation of extracellular matrix which determine the formation of dermal nodules and eosinophilic collagen formation. Both of this conditions are due to a chronical inflammation of the reticular dermis. This could be triggered by different stimuli such as irritation, trauma, surgery, burn, acne, and herpes zoster. The main difference between a hypertrophic scar and a keloid is the durability and the growth over the margins of the scar.^[7] Another interesting theory regards the microbiome skin type and the dysregulation of the bacterial subtypes on the skin which could determine a microinflammatory state and contributes to alter the healing process.^[8] During healing process, the fibroblast produces collagen which is fundamental in the extension and restriction phase of the wound. The collagen is produced in the firsts two weeks, then the 90% of tensile strength is reached at day 30, and this is a trivial component in healing process. So, normally at two months follow up we can observe a complete first phase of scar formation and if some problem occurs, it will show up in this period. Keloid formation after 6 month follow up are rare.^[9]

In 2020 with the pandemic of SARS-CoV-2, the use of facial masks has become a required health tool to control the spreading of the virus. The continuative and constant pressure and friction created by ear-looped masks induces an eventual subclinical inflammation process in the support and contact areas.^[10] We can consider as support point the auriculo-cephalic sulcus and we can easily understand that especially in patient who underwent to an otoplasty whit a classical post-auricular incision the mask can influences the healing process. The Senior author has a large experience in rhinoplasty, and we could observe even in these patients the use of facial masks induces a prolonged redness at the level of the tip and a longer period of tip refinement. In this case report, we present an otoplasty case complicated by a late keloid formation apparently due to the trauma induced by the ear-loop masks over the retro-auricular incision area.

CASE REPORT

A 29-year-old man with bilateral prominent ears with weak antihelical folds and significant conchal hypertrophy (Figure 1a, 2a and 3a), underwent to a bilateral otoplasty with the pillar technique in 2019 June. It was used the postauricular approach, with Mustardè sutures and pillars technique approach for a better definition of the auriculo-cephalic angle and to obtain the reduction of the enlarged conchal bowls along with antihelix reconstruction, respectively.^[11] The cartilage sparing techniques consent to reduces as maximum the irregularities and preserving the natural aspect of the ears. Using this approach, is it possible to flatten the excess of conchal cartilage with a minimal skin incision. A preoperative accurate disinfection is always recommended in otoplasty procedure.^[12] Operative site dressings including a antibiotic fat gauze compressive dressing at the concha area and a Barton manner head wrap were maintained for 2 days,^[13] and the patient completed a prophylactic 1-week course of cephalexin. Antibiotic ointment for the first 15 days, we used to prescribe Bacitracine ointment. After the 2 days of post operative compression, we ask to the patient to apply a gym headband for consecutive two

month at night. At the routinely 1 week, 1 month and 6 months post operative control there were no sign of complication, with a pleasant surgical improvement (Figure 1, 2 and 3).



a

b

c

Figure 1: Frontal view. a) pre-op; b) 1month pos-op; c) 6 months pos-op



a

b

c

Figure 2: lateral view. a) pre-op; b) 1month pos-op; c) 6 months pos-op



a b c

Figure 3: posterior view. a) pre-op; b) 1month pos-op; c) 6 months pos-op

However, 11 months postoperatively, the patient presented with new onset discomfort and itching, postauricular erythema, and gradually keloid formation. The patient states that the signs and symptoms started to manifest after the compulsory use of facial masks due to COVID pandemic, when an ear-looped mask was required to attend work and was used in a daily basis. In 2022 March (33 months after surgery), the patient came to the clinic showing a bilateral keloid formation (more aggressive at the left side) at the postauricular incision, surrounded by erythema (Figure 4). When the patient wears the facial mask, it is interesting to see that the keloid was formed exactly where the mask laces contact with the incisions lines. The incision areas where the mask does not contact have no sign of inflammation or other reaction (Figure 4c).



Figure 4: 33 months post-op. a) frontal view; b) lateral view; c) posterior view; d) posterior with the ear-loop facial mask



Figure 5: 1-week pos-op2; a) left ear; b) right ear



Around 2/3 ml of Triamcinolone were injected, 1/1,5 ml on each side, deeply in the keloid formation followed by compressive taping. The patient was reevaluated at 15 days post injection with no improvement noted. After discussing the options with the patient, a decision was taken to perform a keloid resection under local anesthesia. The lesion was removed; in both sides of the incision the skin was generously undermined to bring the borders together avoiding any closure pressure. A PDS 5.0 was used for subcutaneous suturing and a Vicry Rapid 5.0 running suture for the skin.^[14] Immediately after the closure, intraoperatively, 1 ml of Triamcinolone was injected around the wound borders and deep to it in each side. A generous amount of antibiotic ointment (bacitracine) was covering the suture lines before the taping. After 1 month a silicone ointment was applied twice a day for 2 months. The patient avoided the use of ear-loop facial masks, if needed the option would be a posterior strip mask. Here we present the post operative picture at 1 week (Figure 5), post keloid resection and 6 months (Figure 6). No signs of inflammation or keloid recurrence so far.



Figure 6: 6 months post-op2;

DISCUSSION

Otoplasty with Pillar technique is an effective and safe procedure, with more than 95% of satisfying results and an estimated complication rate of just 1.3%.^[4] The main complication is protrusion of the permanent suture that could lead to infection and is considered a rare complication, other complications are otohematoma and keloid formation and irregularities. Patients wearing ear-loops mask in the postoperative period, however, have an increased risk of infection. The intensive use of masks applies a constant pressure that could influence skin's repair mechanism, led to interrupt the epidermal barrier.^[7] It is evidenced in another case series that the use of protective masks in an inappropriate way (the same mask more than 4 hours) could alter the microbiota of the skin causing a substratum of inflammation and prolong the healing process and increasing the amount of infection rate. There are different solutions for treating keloid formation such as compressive taping, the use of silicon tape, laser procedures and corticoid injections.

We believe that keloid formation in our case doesn't have any relationship with the suturing technique or tensioning at the closure line; we performed our routine sequence, using deep inverted 5.0 polidioxanone (PDS) suture to bring together the SMAS flaps releasing all the tension on the skin. The use of Vicryl Rapid 5.0 has shown to be very effective for post-auricular skin closure, as it has not shown an inflammatory response and it dissolves naturally in around 2 weeks, avoiding the need of suture removal, which is very important in children. Apparently Vicryl Rapid 5.0 has the best characteristics of tensile strength and the right timing of degrading into the skin leaving almost imperceptible amount of suture materials into the tissue. Even if we can compare to nylon or to monofilament sutures this has better characteristics.^[14]

Otoplasty patients have several options to decrease their exposure to airborne pathogens while also lowering risk of postoperative complications. Masks that do not rely on ear loops are an obvious and attainable solution. If alternative masks are unavailable or unaffordable, multiple methods have been described for modifying an ear

loop mask to redistribute the pressure by using common items like a piece of plastic or headband with buttons. Moreover, we think that is important to treat the retro auricular skin in a proper manner in post operative period applying an antibiotic keeping the epidermal barrier intact and clean.

CONCLUSION

Healing process is a fundamental part of the surgery and often it can lead to unpredictable complications. Keloid formation after otoplasty could occur even in a late onset follow up, especially if any disadvantage condition is observed, like direct trauma on the suture line, for that reason extending the post operative control for at least 1 year post operative time may be interesting.

Intraoperative control of the skin closure tension, antibiotic ointments and eventual silicone covering may help avoiding healing drawbacks. The direct trauma over the post-auricular scar, even in a later stage of the healing process, around 1 year post-op, may lead to some scar reaction with a possible keloid formation.

We described here an indirect consequence of the COVID pandemic a post-otoplasty keloid formation apparently promoted using ear-loop facial masks.

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