

Periauricular Keloids on Face-Lift Scars in a Patient with Facial Nerve Paralysis

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Summary: Keloids are caused by excessive scar formation that leads to scar growth beyond the initial scar boundaries. Keloid formation and progression is promoted by mechanical stress such as skin stretch force. Consequently, keloids rarely occur in paralyzed areas and areas with little skin tension, such as the periauricular region. Therefore, periauricular incision is commonly performed for face lifts. We report a rare case of keloids that arose from face-lift scars in a patient with bilateral facial nerve paralysis. A 51-year-old Japanese man presented with abnormal proliferative skin masses in bilateral periauricular scars. Seventeen years before, he had a cerebral infarction that resulted in permanent bilateral facial nerve paralysis. Three years before presentation, the patient underwent face-lift surgery with periauricular incisions. We diagnosed multiple keloids. We removed the masses surgically, closed the wounds with sutures in the superficial musculoaponeurotic system layer to reduce tension on the wound edges, reconstructed the earlobes with local skin flaps, and provided 2 consecutive days of radiotherapy. The wounds/scars were managed with steroid plasters and injections. Histology confirmed that the lesions were keloids. Ten months after surgery, the lesions did not exhibit marked regrowth. The keloids appeared to be caused by the patient's helmet, worn during his 3-hour daily motorcycle rides, which placed repeated tension on the periauricular area. This rare case illustrates how physical force contributes to auricular and periauricular keloid development and progression. It also shows that when performing surgery with periauricular incisions, care should be taken to eliminate wound/scar stretching. (*Plast Reconstr Surg Glob Open* 2017;5:e1417; doi: 10.1097/GOX.0000000000001417; Published online 25 July 2017.)

Keloids are the result of excessive scar tissue formation. These skin fibrotic lesions develop after surgery, injury, or even small insults that generate inflammation. Various lines of evidence indicate that keloid formation and progression are driven by mechanical stress on the edges of the wounded/inflamed/scarred skin. First, keloids are much more likely to occur on body regions that are characterized by frequent and/or pronounced skin stretching (e.g., the anterior chest) than on areas with little skin stretching (e.g., the parietal region).¹ Second, they take distinctive shapes that reflect the dominant directions of skin stretch.² For example, keloids on the shoulder often grow along the long axis of the body

region and thus have a distinctive “dumbbell-shape” that is marked by bulging at both ends of the long axis.³ Third, keloids are rarely observed in body areas that have sensory or motor nerve paralysis.⁴ This reflects the fact that the paralysis restricts the motion of the affected body region.

Given these observations, we were initially puzzled by the case of periauricular keloids that we present here. These keloids arose from periauricular face-lift scars. The patient had bilateral facial nerve paralysis. The factors that contributed to the formation and progression of these keloids will be discussed.

CASE REPORT

A 51-year-old Japanese man was admitted with abnormal proliferative skin masses that arose from bilateral periauricular scars. The patient has had bilateral facial nerve paralysis since he had a cerebral infarction 17 years previously. Three years before admission in our institution, he underwent face-lift surgery at another hospital. This surgery involved preauricular incisions followed by

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Received for publication March 31, 2017; accepted May 30, 2017.

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DOI: 10.1097/GOX.0000000000001417

Disclosure: *The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.*

incisions in the postauricular area along the earlobe base. There was no past or family history of keloids. The patient had hypertension that was controlled by medication. After the face-lift surgery, the scars gradually became larger and harder. This was accompanied by a strong itch, slight pain, and contracture (Fig. 1). During questioning, the patient mentioned that the growth of the masses had started interfering with his use of a motorcycle helmet, which he wore every day for his 3-hour rides.

We diagnosed multiple keloids and performed surgery followed by radiation. The surgery involved removing the masses as much as possible, reducing the tension on the edges of the wounds by suturing the superficial musculo-aponeurotic system layer and reconstructing the earlobes by using local skin flaps (Fig. 2). Starting the day after surgery, the patient underwent electron beam radiotherapy (7.5 grays per fraction) for 2 consecutive days. Hematoxylin and eosin staining showed that the masses bore the histological feature of keloids, which confirmed that the lesions were keloids (Fig. 3). After surgery, the scars have been managed by applying steroid tape and injections. After 10 months, clear regrowth was not observed (Fig. 4).

DISCUSSION

Keloids are generated by multiple factors, including genes and various systemic and local factors.⁵ The genetic factors include 4 single nucleotide polymorphisms,⁶ which associate with the formation of keloids, whereas the systematic factors include hypertension⁷ and pregnancy,⁸



Fig. 1. Preoperative findings of the right preauricle.



Fig. 2. Intraoperative findings.

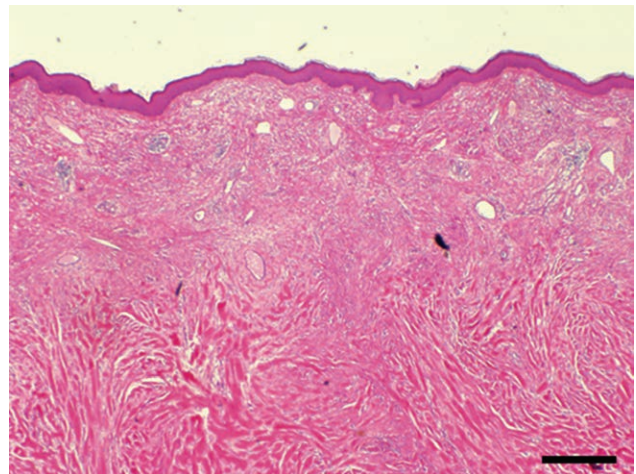


Fig. 3. Histological findings (Hematoxylin and eosin staining), bar: 500 μ m.

both of which appear to influence the severity of keloids. The most significant local factor is mechanical stress, specifically skin stretching, on the edges of keloids: such stress has been shown to promote keloid progression.¹

These discoveries have important implications in terms of keloid therapy. First, we have demonstrated in Japan that the most effective treatment for severe keloids in Asian patients is surgical resection, closing with tensile reduction sutures and postoperative radiation.⁹ Second, because the patients may have a genetic predisposition to develop keloids, the postsurgical wounds and scars must undergo careful management that eliminates inflammation and mechanical stress on the wound/scar, thus pre-



Fig. 4. Ten months after surgery. No regrowth of keloid was observed.

venting recurrence. This management regimen includes the use of steroid tapes and/or injections and/or the use of silicone sheets/tapes that shield the wound edges from mechanical tension.

In relation to our case, we were initially puzzled by the fact that the patient had developed keloids in periauricular scars. Keloids are rarely observed on body regions that are subjected to less mechanical force, including the head, forehead, cheek, and periauricular region: the latter region is where our patient's keloids were located. Our puzzlement was amplified by the fact that before the face-lift surgery, our patient developed permanent bilateral facial nerve paralysis that restricted his ability to move his cheeks during facial expression: it has been shown that keloids rarely occur on body regions that have sensory or motor nerve paralysis.⁴

The puzzle was resolved when, during history taking, the patient mentioned that he drove every day for 3 hours on a motorcycle and that his keloids were hampering his use of a motorcycle helmet. It seems that in our patient, the prolonged daily physical force on the auricles imposed by the helmet and the vibrations from the motorcycle caused them to move repeatedly and place intermittent stretch stress on the periauricular area, which is where the face-lift scars were located.

Hematoma is the main complication of face-lift surgery: keloid formation after face-lift surgery has not been reported previously.¹⁰ Indeed, periauricular incision is commonly used in face-lift surgery precisely because there is little movement in this region, which in turn reduces scar prominence and the risk of wound complications. Our patient did not have a history of keloids or family keloids. Thus, this case shows that repeated physical force

can cause keloids, even on regions of the body such as the periauricular area that undergo very little natural movement during daily life. It should be noted that our patient also had hypertension. Because hypertension has been suggested to influence the severity of keloids,⁷ it is possible that hypertension may have contributed to the progression of the keloids in this rare case.

This case further stresses the complications and importance of the factors associated with keloid onset, which remains mostly refractory to both medical and surgical treatment. In recent years, some trials were reported novel approaches for keloid therapy^{5,9}; however, more studies are required to improve these approaches and develop new therapies.

SUMMARY

Our case shows that even after face-lift surgery, or any surgery that employs periauricular incisions, it is important to follow the surgery with a management regimen that eliminates mechanical stress on the wound. Along with postoperative local therapies, it is also important to control hypertension by oral administration of antihypertensive medication.

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