

Four Cases of Keloid

— Surgical Keloidectomy and Adjunctive Therapy —

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Keloid is a hyperproliferative disorder of dermal connective tissues, that sometimes causes perplexity and cannot be managed with medical therapy alone, such as intralesional corticosteroids or interferon injections. In those cases, the best results can be obtained when medical therapy is combined with surgical therapy.

Four cases of keloid that had been successfully treated with surgical keloidectomy and postoperative adjunctive therapy are herein reported. (*Ann Dermatol* 9:(1)59~63, 1997).

Key Words : Adjunctive therapy, Keloid, Keloidectomy

Keloids are benign hyperproliferative tumors of dermal connective tissues that usually results from excessive responses to cutaneous trauma in predisposed individuals. That scars extend beyond the border of injury whereas hypertrophic scars are confined to the area of initial injury¹. The lesions tend to occur on the upper part of the body as firm, raised tumors with a glassy surface and well demarcated borders. Without treatment, keloids persist indefinitely, but hypertrophic scars usually undergo spontaneous resolution within 12 to 24 months. Regardless of the anatomic location and the size of keloids, intralesional corticosteroid therapy is usually selected to be the first choice of treatment.² But, we should carefully consider the combination of medical and surgical therapy in cases that do not respond or for whom efficacy with a single treatment modality of intralesional corticosteroid injection is poorly expected.

CASE REPORTS

Case 1

A 21-year-old woman was referred from a plastic surgeon due to a recurring keloidal mass on her left flank for over 10 years. Previously, a dermatologist who had failed to treat her keloid by intralesional injections, referred her to a plastic surgeon in order to excise the total mass. The keloidal mass had recurred and was even larger soon after surgery. Finally, she was referred to our department. The lesion was a 3.4 × 3.4 × 2.5cm sized, dome-shaped mass with a glassy and telangiectatic surface (Fig. 1). A skin biopsy was performed and a diagnosis was made histopathologically. We decided to treat her keloid with surgical and adjunctive therapy. Complete surgical keloidectomy was done at the clear margin of the keloidal mass and the skin defect was recovered by bipedicle subcutaneous sliding flaps. Triamcinolone acetonide with 10mg/ml concentration was injected intraoperatively at the surgical wound. Consecutive adjunctive therapy including colchicine 0.6mg p.o. t.i.d., and intralesional triamcinolone injection biweekly started 2 weeks after surgery, and was maintained for 3 months. The operation sites were also pressed with plastic adhesive taping for 16 hours a day during the postoperative 6 months. During the follow-up period of 3 years (Fig. 2), small papular

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Fig. 1. Case 1 : keloid on left flank ; before treatment.

Fig. 2. Case 1 : Postoperative 26 months.

Fig. 3. Case 2 : keloids on posterior helix of right ear ; before treatment.

Fig. 4. Case 2 : postoperative 11 months.

keloids were occasionally found at the site of suturing, but they responded well to the intralesional triamcinolone injections.

Case 2

A 12-year-old boy presented with a 15-months history of developing two coupled, rubbery to stony hard masses on the posterior helix of his right ear. The lesions, which were itchy and painful, measured $1.5 \times 1.1 \times 0.7$ cm and $2.7 \times 1.6 \times 1.5$ cm (Fig. 3). The perilesional and overlying skin were markedly telangiectatic. There was no family history of keloids. The patient had been

traumatized 20 months ago when batting in a baseball game but had not otherwise been ill. The therapeutic expectation of treatment with intralesional steroid injections only was poor even though the diagnosis of keloid was made histopathologically. Surgical keloidectomy and adjunctive therapy were planned and designed with half-moon shaped excision of the smaller lesion and total excision of the larger one. The majority of keloidal tissues was dissected and the skin defects were recovered with the half-moon shaped overlying skin. Immediately after the surgical procedure, the operation area was injected with repository

Fig. 5. Case 3 : keloid on lower lip ; before treatment.

Fig. 6. Case 3 : postoperative 10 months.

Fig. 7. Case 4 : keloids on sternal and inter-breast area; before treatment; The lowest band-like keloid (arrow) was excised with a carbon dioxide laser.

Fig. 8. Case 4 : postoperative 6 months.

steroids intralesionally and dressed with a bolus. Adjunctive therapy started from the 14th postoperative day and included colchicine p.o., intralesional injections of steroid, silicone patch sheeting and pressure dressing. Nothing recurred during the follow-up period of 21 months after surgery (Fig. 4).

Case 3

An 8-year-old boy presented with recurrent keloid on his lower lip. The lesion was a dome-shaped, $1.2 \times 1.1 \times 0.7$ cm sized, rubbery hard mass with downward retraction of the lower lip (Fig. 5). The mass developed 21 months ago by traumatization. The total mass was excised by a surgeon and diagnosed histopathologically as a keloid. The patient was referred to the Department of Dermatology, Holy Family Hospital, when the keloidal mass recurred and grew larger in size. At first, he was treated periodically with intralesional triamci-

nolone injections and cryotherapy. The downward retraction of the lower lip and the size had not improved even after the mass had become soft after 5 months' treatment. The patient was put under a surgical keloidectomy and adjunctive therapy program. The whole keloidal tissues were excised and the resultant skin defect was grafted with full-thickness postauricular skin. Adjunctive therapy was followed with colchicine p.o., and intralesional triamcinolone injections. No new lesions were noted 12 months after surgery, but only slight pigmentation was left (Fig. 6).

Case 4

A 32-year-old woman presented with multiple keloids on her anterior chest and both shoulders (Fig. 7). All keloids, except one that was located on the bally of her breasts, had softened and flattened by intralesional triamcinolone injections and cryotherapy. The lesion on her inter-breast

area was cord-like, hard and induced retraction of both sides of the skin towards the center. It was excised and coagulated with 6 watt power, a continuous defocused beam of carbon dioxide laser. Denuded skin was dressed with non-adherent gauze and was injected with triamcinolone bi-weekly. After it had healed completely, triamcinolone was injected intralesionally at monthly intervals over an 8 months follow-up period without recurrence. (Fig. 8).

DISCUSSION

Keloid is a benign, firm, variably pruritic or tender scar that is commonly encountered after injuries in certain familial and racial groups. They have a particular predilection for developing on the upper trunk, arms and neck, especially after burn injuries, surgical procedures and vaccinations³. These benign tumors frequently occur in anatomic sites where the skin is under increased tension, such as overlying the bony prominence of the shoulders, upper arms, sternum and mandible⁴. The lesions tend to persist and grow relentlessly until they eventually become larger than the original size of the initial wound⁵. They are distinct from hypertrophic scars in that they encompass skin sites beyond those involved in the original injury⁶.

Patients often present for cosmetic reasons, but the discomfort frequently associated with these skin growths may also prompt them to seek medical attention. A variety of therapeutic tools have been used to treat keloids, including pressure⁷, radiation therapy⁸, pharmacotherapy⁹, cryosurgery¹⁰, conventional excisional surgery¹¹ and laser surgery^{12,13}. There are no doubts that intralesional repository steroids, such as triamcinolone acetonide, injected intralesionally is the first tool to treat the keloid in most cases. However, we often have to face the cases that do not respond to a single modality of steroid injections. The treatments that have proved most effective, in such cases, are those that combine one or more of the above approaches. Whatever modalities are used to treat the keloids, they should be able to minimize skin tension and lessen injuries to the lesions.

The major difficulty of surgical treatment of keloids is the tendency for recurrence after surgical removal. Surgery alone leads to recurrence rates ranging from 45 to 100 %^{3,14,15}. But recurrence rates

tend to be decreased when adjunctive or supplemental therapies are followed after surgical keloidectomy¹⁴. For this reason, maintenance of an extended remission after keloidectomy is a formidable challenge to dermatologists. We must keep in mind some factors to help predict the surgical outcomes. Areas of high tension, particularly those overlying bony prominences, such as the presternum and shoulder are associated with a high rate of recurrence after surgical excision. In addition, clinically active keloids those are characterized by claw-like peripheral extensions or with dumbbell shapes, are among the most resistant to therapy. But in the long run, the surgical outcomes might depend on which surgical approaches are combined with which adjunctive therapies.

Surgical treatment may involve the use of cryosurgery, laser surgery, electrosurgery, or simple conventional scalpel surgical excision, skin graft and skin flaps. When simple excision and closure is not possible because of excessive anticipated resultant skin tension, tension relieving procedures such as skin grafting (in case 3) and skin flaps (in case 1) may be required. It is not easy to choose between skin flaps and grafts. The location and size of a keloid should be considered carefully. Skin flaps might be preferred to grafts in fatty areas such as the body trunk, because the sliding effect of fatty tissues could lessen the tension. In addition, skin grafts have an unfortunate tendency to recur the keloid in recipient sites as well as to cause another one in donor sites. One way to avoid this secondary keloid is to harvest the skin grafts from the skin overlying the keloid¹⁵, as in case 2. That should be classified as skin grafting because their skin connection to adjacent normal skin would never work as a pedicle for blood supply. This technique is particularly useful for treatment of very large keloids, especially in non-fatty areas such as the earlobes and helixes. Keloidal tissues that remain underneath grafts should be considered for treatment with adjunctive therapy.

Recently several lasers have been used with various outcomes. In general, their results showed similar recurrence rates as conventional surgery^{13,16,17}. Defocusing mode of carbon dioxide laser coagulation was successfully used to treat keloids on the anterior chest in case 4. Blood vessels, nerves and lymphatics were sealed creating a dry environment with minimal tissue trauma.

There are so many types of adjunctive therapy for prevention of keloids after surgical treatment, for example, pressure therapy, radiation therapy, a variety of systemic pharmacotherapies and a topical silicone gel sheeting. Although all of them are valuable, intralesional injection of corticosteroids most often takes a form of adjunctive therapy. Usually 40 mg/ml concentration of triamcinolone acetonide is injected into the operative bed intraoperatively and postoperatively. Colchicine is another pharmacological agent that could prevent recurrence of keloids after surgical keloidectomy, because it is effective in increasing the collagenase activity and decreasing the collagen synthesis on wound healing^{18,19}. Now we are waiting for the comparative results of postoperative adjunctive therapy in the future.

In conclusion, the combined therapeutic approaches might offer a significant cosmetic and functional improvement in troublesome keloids.

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