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The Combination of Surgical Excision with Debulking Technique and Intralesional Triamcinolone Acetonide Injection in the Management of Keloid

Riana Miranda Sinaga[1*], Desy Sahara Putri S[2]
[1,2]*Departement of Dermatology Venereology and Aestethic, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia*
[*]Corresponding Author: rianamirandasinaga@gmail.com

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ABSTRACT

Background: Keloid is a fibroproliferative disorder of the dermis resulting from abnormal wound healing, characterized by excessive collagen deposition, thickened and highly vascularized dermis, and abundant infiltration of inflammatory cells.The highest incidence of keloid occurs in individuals during their second decade of life. **Case Ilustartion:** A 16-year-old female presented to the Dermatology and Venereology Clinic at Prof. Chairuddin P. Lubis Hospital, Medan, with the chief complaint of a lump on the front and back of her left earlobe accompanied by itching for the past three years. Initially, 4 years ago, the patient complained of itching after ear piercing. Over time, a lump appeared at the site of the piercing. The lump was reported to have gradually increased in size over the past 2 years. Dermatological examination, there was a solitary erythema nodule with firm boundaries, with a spongy solid consistency, oval round shape and size 1.4x1.3x0.9 cm, regular edges, smooth surface in the region of the anterior auricularis lobule sinistra and posterior auricularis lobule sinistra. The patient was diagnosed with keloid. This case study highlights the potential of combining surgery with corticosteroid injections, although monitoring is still required, this technique can prevent recurrence. **Discussion:** It is stated in the literature that combination treatment is the optimal strategy and from most studies it has been found that surgical excision combined with steroid injection shows a recurrence rate of less than 50%. **Conclusion:** Keloid treatment should be done in combination to reduce recurrence.
Keyword: Keloid, Excision, debulking, Triamsinolone

ABSTRAK

Latar Belakang: Keloid merupakan kelainan fibroproliferatif pada dermis akibat penyembuhan luka yang tidak normal, ditandai dengan deposisi kolagen yang berlebihan, penebalan dan vaskularisasi dermis yang tinggi, serta infiltrasi sel inflamasi yang melimpah. Insidensi keloid tertinggi terjadi pada individu pada usia dekade kedua. **Ilustrasi Kasus:** Seorang perempuan berusia 16 tahun datang ke Poliklinik Dermatologi dan Venereologi RS Prof. Chairuddin P. Lubis Medan dengan keluhan utama adanya benjolan di bagian depan dan belakang daun telinga kiri disertai rasa gatal sejak tiga tahun yang lalu. Awalnya, 4 tahun lalu, pasien mengeluh gatal setelah tindik telinga. Seiring waktu, benjolan muncul di lokasi penindikan. Benjolan tersebut dilaporkan bertambah besar secara bertahap selama 2 tahun terakhir. Pada pemeriksaan dermatologi terdapat bintil eritema soliter berbatas tegas, konsistensi padat seperti spons, bentuk bulat lonjong dan ukuran 1,4x1,3x0,9 cm, tepi teratur, permukaan licin pada daerah lobulus aurikularis anterior sinistra dan lobulus aurikularis posterior sinistra. Pasien didiagnosis dengan keloid. Pasien kemudian direncanakan untuk dilakukan eksisi bedah dengan teknik debulking dan injeksi triamcinolone acetonide intralesi.. **Pembahasan:** Penatalaksanaan kombinasi merupakan strategi yang optimal dan sebagian besar penelitian ditemukan bahwa eksisi bedah yang dikombinasikan dengan injeksi steroid menunjukkan angka kekambuhan >50%. **Kesimpulan**: Pengobatan keloid sebaiknya dilakukan secara kombinasi untuk mengurangi kekambuhan.
Keyword: Keloid, Eksisi, debulking, Triamcinolone

1. Introduction

Keloid is a fibroproliferative disorder of the dermis resulting from abnormal wound healing, characterized by excessive collagen deposition, thickened and highly vascularized dermis, and abundant infiltration of inflammatory cells. Keloid is a pathological scar that exceeds the boundaries of the wound and is benign in nature.[1-2] This scar tissue is closely associated with pain, hyperesthesia, pruritus, functional and cosmetic disturbances, as well as psychological stress that can dramatically affect the quality of life of the affected individuals.[5]

The highest incidence of keloid occurs in individuals during their second decade of life. Keloid affects approximately 15-20% of patients of African, Hispanic, and Asian descent. The incidence is equal in males and females, but more female keloid patients seek treatment due to concerns about appearance. Research by Putra and Jusuf in 2012 found that the number of new keloid patients visiting the Skin and Venereal Clinic at RSUP Haji Adam Malik in 2011 was 20, consisting of 10 males and 10 females, and in 2012, there were 22 patients, consisting of 8 males and 14 females. This may be because the primary factor that drives keloid patients to seek treatment is cosmetic appearance concerns, which are more prevalent among women.

The formation of keloids and their progression are complex and not fully understood. Several genetic, systemic, and local factors are associated with keloid formation. These factors trigger persistent inflammation in wounds and scar tissue, leading to chronic fibroblast activity and inhibiting scar tissue maturation. Keloids represent a dysregulation of the skin healing response involving cytokine pathways or excessive and chronic production of certain cytokines, leading to uncontrolled matrix degradation and excessive deposition of extracellular matrix, especially collagen[16]

Keloids can appear on any part of the body. Common areas where keloids often occur include the anterior chest, upper arms, shoulders, and most frequently, the posterior aspect of the earlobes, which are locations with minimal tension. Keloid growth can cause itching and pain as well as an aesthetically discomforting appearance, leading to emotional stress.[17,18]

Management of keloid scars remains a partially resolved issue. There are numerous therapy options available, yet none have shown completely satisfactory results due to their high recurrence rates. Therapy options include surgical excision, intralesional corticosteroid injections, cryosurgery, laser therapy, radiation, and mechanical compression. Surgical excision is the most commonly used technique as it can entirely remove the lesion, but it still carries a drawback with a recurrence rate of more than 50%. To completely remove the lesion and reduce the recurrence rate, a combination of surgical excision with intralesional triamcinolone acetonide injections is required.[19,20]

Here's a reported case of keloid treated with a combination of surgical excision and intralesional triamcinolone acetonide therapy. The aim of this case report is to enhance understanding and knowledge regarding therapy options, combination therapies, and the recurrence rate following keloid treatment.

2. Case Report

A 16-year-old female of Batak ethnicity presented to the Dermatology and Venereology Clinic at Prof. Chairuddin P. Lubis Hospital, Medan, on April 5, 2024, with the chief complaint of a lump on the front and back of her left earlobe accompanied by itching for the past three years. Initially, four years ago, the patient complained of itching after ear piercing. Over time, a lump appeared at the site of the piercing. The patient admitted to frequently touching and scratching the lump due to itching and discomfort. The lump was reported to have gradually increased in size over the past two years since the patient began scratching it frequently. The patient stated that three months ago, she underwent injections with Kenacort into the lump, which reportedly reduced its size when injected regularly. The patient also mentioned frequently touching the lump due to discomfort and its impact on appearance. The patient has no history of wounds healing with enlarged scars on other parts of the body. There is no history of hypertension, diabetes mellitus, or blood clotting disorders. The patient previously self-treated the lump with scar removal cream but reported no improvement. There is no history of applying oil or any other medication before the symptoms appeared. The patient's parents, namely the patient's mother, had the same complaint, namely on the knee after falling from a motorcycle and the patient's brother also had the same complaint on the stomach after cesarean section surgery. On dermatological examination, there was a solitary erythema nodule with firm boundaries, with a spongy solid consistency, oval round shape and size 1.4x1.3x0.9 cm, regular edges, smooth surface in the region of the anterior auricularis lobule sinistra and posterior auricularis lobule sinistra. Based on history and dermatologic examination, the

patient was differentially diagnosed with keloid and hypertrophic scars. The provisional diagnosis of the patient was keloid of the auricular lobule region sinistra.

Figure 1. Dermatologic examination when the patient first arrived. There was a solitary erythema nodule with firm boundaries, spongy solid consistency, oval round shape and size 1.4x1.3x0.9 cm, regular edges, smooth surface in the region of the anterior auricular lobule sinistra (A) and posterior auricular lobule sinistra (B).

The patient was then planned for laboratory examination, surgical excision with debulking technique, intralesional triamcinolone acetonide injection and histopathological examination. Laboratory examinations of complete blood, blood sugar levels and clotting factors were found to be within normal limits. This was followed by an explanation of the surgical excision procedure to be performed as well as possible complications and the signing of informed consent. The patient was prepared for surgical excision. Surgical excision was performed to remove the lesion as therapy (Figure 2a-d), then tissue samples were sent to the anatomical pathology department for histopathological examination.

Figure 2. The successive stages of the operation start from local anesthesia, excision and removal of the lesion, suturing of the excised wound until suturing is completed.

The patient was given systemic antibiotic therapy of ciprofloxacin 500 mg twice a day and mefenamic acid tablets 500 mg three times a day to reduce postoperative pain, and gentamicin ointment 0.1% three times a day. Therapy was given for 7 days. The patient was expected to be seen on the third day after the procedure. The patient was also educated on maintaining wound hygiene.

The first control, it was found that the wound had begun to dry, the pain had decreased. There was no necrosis or signs of secondary infection. The suture was opened intermittently. The patient was then injected with intralesional triamcinolone acetonide 40 mg/mL. Then the wound was given gentamicin 0.1% antibiotic ointment and then covered with sterile gauze again. The therapy given included systemic therapy with ciprofloxacin 500 mg twice daily, mefenamic acid tablets 500 mg three times a day if the pain and gentamicin ointment 0.1% for 4 days. Patients are advised to change the bandage every two days (Figure 3).

Figure 3. Control photos on day 7 after excision (A-B) and the wound after removal of suture thread (C,D).

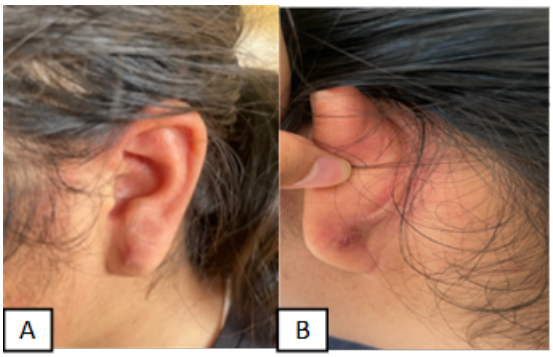
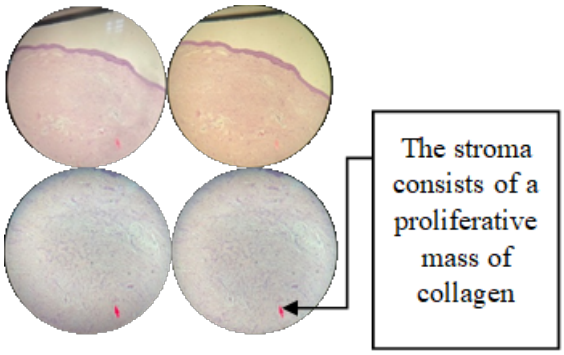


Figure 4: Control after month 2 post excision (A-B)

The second postoperative patient came for a second control, it was found that the excision site had dried and closed well, pain was no longer felt and itching was felt occasionally. No necrosis or signs of secondary infection were found. The patient was not given therapy, the patient was given post-operative education that the possibility of keloid reappearance could occur.

The results of the histopathological examination show that the stroma consists of a proliferative mass of collagen. No skin adnexa were found, and there were no dysplastic cells or signs of malignancy in this preparation. The conclusion supports the clinical diagnosis of keloid (Figure 4).



3. Discussion

The diagnosis of keloids in this patient was made based on the history, dermatological examination and histopathological examination. From the anamnesis it is known that the patient is a 16 year old female. Based on the literature, keloids occur more often in dark-skinned people, although they can occur in all races. Reports of cases of keloids in albinos have not been found. Keloids tend to appear at the age of 10-30 years. There are more women than men, allegedly because of the tendency for body piercing.[17,19]

Initially, four years ago, the patient complained that after having his ear pierced, it felt itchy. Over time, a lump appears at the piercing site. The patient admitted that he often touched and scratched the lump because it felt itchy and uncomfortable. The lump is said to have become noticeably bigger in the last two years since the patient often scratched the lump. Based on the literature, keloids are benign hyperproliferation of dermis collagen, as an excessive tissue response to skin trauma such as burns, piercings, insect bites, and several skin diseases that can be predisposing factors to keloids such as folliculitis, varicella, herpes zoster and acne. Keloids can also appear spontaneously without a history of trauma. Accompanying symptoms are usually itching and pain.[19] Major keloids are keloids that are large, have an elevation of more than 0.5 cm above the surface of the skin, are painful and itchy, exceed the initial wound, and can continue to expand for years. Can cause functional disorders in patients in addition to cosmetic and psychological disorders.

Keloids have a genetic predisposing factor with an autosomal dominant pattern of inheritance.[23] The body's natural response to tissue trauma is scar formation. The wound healing process consists of three phases, namely the inflammatory phase, proliferation or granulation, and remodeling or maturation. When there is an imbalance between the anabolic and catabolic phases of scar formation, the end result is the appearance of pathological scars. There are two types of scars with excess tissue growth, namely hypertrophic scars and keloids.[23,24] Unlike hypertrophic scars which grow within the boundaries of the initial wound even though they are elevated, keloid scars grow beyond the boundaries of the initial wound. Keloid scars are hard nodules and generally do not regress spontaneously.[25] Patients often experience itching. In Caucasian patients, keloid scars are accompanied by erythema and telangiectasia, whereas in dark-skinned patients keloid scars can be hyperpigmented.[26]

On dermatological examination, a solitary erythema nodule was found to be well-defined, with a firm, rubbery consistency, round-oval in shape and measuring 1.4x1.3x0.9 cm, regular edges, smooth surface in the region of the left anterior auricular lobule and left posterior auricular lobule. Keloids extend beyond the trauma area but rarely reach the underlying subcutaneous tissue. Keloids are nodular tumors with a consistency range from soft to hard, shiny, and have a smooth surface. Keloid growth is generally slow but can also develop quickly.[21,22,27,28]

The patient's keloid lesions were found in the front and back of the left ear lobe. Based on the literature, the areas most often affected are the chest, shoulders, upper back, back of the neck, cheeks and earlobes. Initially there was a suspicion that keloids only appeared in areas with high skin tension, however, keloids rarely appear on the palms of the hands and feet, while the ear lobes, which are areas with minimal skin tension, are the most common place for keloids to appear. Unlike hypertrophic scars which are stable but can regress after reaching a certain size, keloids do not regress spontaneously and can grow continuously over time.[25,26]

The results of the histopathological examination of the patient showed that the stroma tissue consisted of proliferative tissue with the conclusion of keloids. Based on the literature, keloids show an increased composition of collagen and glycosaminoglycans with thickened coils of hyalinized collagen fibers, while the orientation of collagen fibers in normal scar tissue is parallel to the epidermis.[19]

In this patient, the treatment chosen was a combination treatment, namely surgical excision with a debulking technique and closure of the defect with a flap from the keloid skin itself and intralesional triamcinolone acetonide injection..

Debulking was chosen for this patient because debulking is a surgical therapy that can be used to treat keloids, where the literature states that debulking can be used on tumors that are visible to the eye.[30] The debulking procedure performed on this patient was surgical excision. Excisional surgery is a procedure that is often used for debulking. 31 In excisional surgery, partial debulking can be performed to reduce the thickness of the tumor.[32]

In this patient, keloids were found in the form of nodules in the left anterior and posterior auricular lobule region so that they looked quite large in that area. Keloid skin is used to cover the defect after debulking surgery. In accordance with the literature on large keloids, to avoid keloids in the donor area, autograft can be used and this method uses skin from the keloid to cover the defect after debulking surgery.[33]

Next, the patient was injected with intralesional triamcinolone acetonide. After debulking, intralesional corticosteroid injection will be easier and the injection time required will be shorter. The combination of debulking with intralesional corticosteroid injection some time after surgery guarantees uninterrupted defect closure and rapid resolution compared to using either technique alone.[34] Intralesional corticosteroids are used for keloid therapy because they have a good response, are easy to use and have low side effects. Corticosteroids work by suppressing wound inflammatory mediators and fibroblast growth while increasing collagen degradation.[35] The mechanism by which triamcinolone alters fibroblast growth includes inducing fibroblast hypoactivity by decreasing tumor growth factor (TGF)-β expression and reducing fibroblast density by increasing fibroblast apoptosis and to reduce scar tissue volume.[36,37] However, the therapeutic response rate of intralesional corticosteroid therapy varies widely. Potential side effects of corticosteroid injection include pain upon injection, skin atrophy, changes in skin pigmentation, and telangiectasis formation.

On the 14th day after thread removal, the patient was injected with intralesional triamcinolone acetonide 40 mg/mL. According to the literature, the dose used for intralesional coticosteroids is 10–40 mg/mL depending on size and location.[1,22,33] Triamcinolone acetonide injection is performed 2–4 weeks after surgery.

In this case, keloid treatment was carried out using a combination of surgery with intralesional triamcinolone acetonide injection. It is stated in the literature that combination treatment is the optimal strategy and from most studies it has been found that surgical excision combined with steroid injection shows a recurrence rate of less than 50%.[22,33]

4. Conclusion

Keloid treatment should be done in combination to reduce recurrence. In this case report, a combination of therapy was carried out using debulking techniques and flap closure using the skin from the keloid itself and intralesional triamcinolone acetonide injection. Keloid defects in the debulking technique can be covered with skin from the keloid itself. To assess the results of this treatment, more cases and a longer observation time are needed.

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