



## Bioscientia Medicina: Journal of Biomedicine & Translational Research

Journal Homepage: [www.bioscmed.com](http://www.bioscmed.com)

### Management of Earlobe Keloid by Triple Combination Therapy (Core Excision, Fillet Flap, and Intralesional Corticosteroids): A Case Report

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#### ARTICLE INFO

##### Keywords:

Corticosteroid  
Earlobe  
Keloid  
Fillet flap

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All authors have reviewed and approved the final version of the manuscript.

<https://doi.org/10.37275/bsm.v6i15.677>

#### A B S T R A C T

**Background:** Keloid is a growing neoplasm characterized by the proliferation of benign fibroblasts. The chest, shoulders, head, especially the ear lobes, neck, arms, and upper back are the areas most commonly affected by keloids. The use of a fillet flap allows dissection of the keloid core and leaves loose skin for wound closure. This study aims to describe the surgical management of keloids in the auricular region using the core excision technique with a keloid fillet flap with a combination of corticosteroid injections. **Case presentation:** A 54-year-old man came with the main complaint of a red lump with hard consistency and itching on the right ear. The management of this patient was surgery using the core excision technique with a keloid fillet flap followed by intra-operative intralesional and immediate post-operative corticosteroid injection and then programmed for corticosteroid injection at the next follow-up. Post-operative therapy was given cefixime 2x100mg and oral analgesic mefenamic acid 3x500mg for 5 days. **Conclusion:** Keloid surgery is the treatment of choice because it produces good cosmetic results quickly. Routine follow-up and additional therapy are required to prevent a future post-operative recurrence.

#### 1. Introduction

Keloids are growing neoplasms characterized by the proliferation of benign fibroblasts.<sup>1-3</sup> These neoplasms are characterized clinically by excessive scar tissue growth that extends beyond the original margin. This abnormal fibroproliferative growth is characterized by excessive deposition and degradation of the damaged extracellular matrix resulting from the prolonged inflammatory phase of wound healing.<sup>4</sup>

The chest, shoulders, head, especially the ear lobes, neck, arms, and upper back are the areas most commonly affected by keloids.<sup>3</sup> Keloids are caused by skin trauma (such as body piercing or surgery) or pathological cutaneous processes such as acne, chickenpox, and burns.<sup>4</sup> Keloids cause pain, pruritus,

and burning that can lead to psychological stress, depression, and decreased quality of life.<sup>5</sup> Ear piercings, burns, abrasions, tattoos, immunizations, insect bites, and inflammation are all causes of keloids on the earlobe. Keloids usually develop months or years after the initial trigger and usually do not improve.<sup>6</sup>

According to epidemiological data, a family history of keloids is influential, and this disease affects both men and women equally in the same age group. The overall incidence in women was reported to be higher than in men in some studies, which may be due to greater attention to aesthetics and more frequent ear piercings by women.<sup>3</sup> Keloids usually appear between

the ages of 10 and 30 and increase in growth during pregnancy and puberty.<sup>6</sup> The incidence of keloids in individuals with dark skin is 15 to 20 times higher than in those with fair skin. Keloids are more likely to develop after 11 years old.<sup>7</sup> The incidence of earlobe keloids after the piercing is estimated at 2.5%.<sup>6</sup>

Patients usually report pruritus, pain, burning, secondary infection, ulceration, impaired movement, and impaired cosmetic appearance as the most bothersome clinical effects.<sup>6</sup> Keloids are difficult to treat because of their high recurrence rate and resistance to treatment. Physical defects can be formed by the presence of keloids or other lesions during treatment. Surgical excision has a 20 to 25% success rate.<sup>8</sup> Excision can be combined with other therapies, including steroid injection, post-operative radiation, interferon alpha-2b injection, and imiquimod cream.<sup>8</sup>

Surgical excision, intralesional injection, application of pressure immediately after injection, silicone gel sheets, radiotherapy, or a combination of the four techniques are recommended for the treatment of recurrent earlobe keloids. The use of a "fillet flap" allows dissection of the keloid core and leaves loose skin for closure.<sup>9</sup> Excision in combination with other post-operative modalities, such as radiotherapy and interferon (IFN) injections or corticosteroid therapy, can reduce recurrence rates. One treatment modality of surgical excision alone results in a recurrence rate of 45-100%.<sup>9</sup> Compression therapy, laser excision, and serial steroid injections can improve treatment outcomes for auricle keloids when given in a combination of modalities.<sup>10</sup> This study aims to describe the surgical management of

keloids in the auricular region using a core excision technique with a keloid fillet flap in combination with corticosteroid injection.

## 2. Case Presentation

A man, 54 years old, came with the main complaint of a reddish lump with hard consistency and itching on the right ear. This has been experienced by the patient since 7 years ago after trauma from scratching. At first, it was a small itchy rash that got bigger and bigger. Previously, the patient went to a surgeon and was told that the patient had keloids. The patient received a corticosteroid injection and surgery. Complaints improved after surgery. However, a few moments later, the lump reappeared.

On physical examination, vital signs were within normal limits. Examination of the dermatological status in the right auricle region showed a solitary nodule of skin color, shiny, and some areas were pink, well defined, with a size of 5x2x2 cm. There was telangiectasia and a solid, palpable lump (Figure 1). This patient was diagnosed with recurrent keloid. The management of this patient was surgery using the core excision technique with a keloid fillet flap followed by injection of corticosteroid 40 mg/mL intraoperatively and immediately postoperatively (Figure 2). Corticosteroid injection was continued at the next follow-up. Postoperatively, the patient was treated with cefixime 100 mg/12 hours and mefenamic acid 500 mg/8 hours orally for 5 days. Patients are also advised to treat the surgical area so that it is not exposed to water and to change the bandage every 2 days or if needed. The sutures were removed on the tenth post-operative day.



Figure 1. Auricular region before the procedure.



Figure 2. Post-operative surgery with core excision accompanied by wound closure using a keloid fillet flap.

### 3. Discussion

Keloids are caused by a prolonged inflammatory phase that can inhibit wound healing. Genetic, systemic, and local risk factors contribute to this prolonged inflammatory response. Systemic factors are hypertension, pregnancy-related hormones, and abnormal cytokine levels, while genetic factors are single nucleotide polymorphisms. The mechanical force (tension) associated with the scar is an important local factor in keloid formation.<sup>11</sup>

Surgical treatment is one of the main effective treatments for keloids. Surgical techniques include core excision and fillet flap keloids. The procedure begins with an incision made in the lesion, approximately 1 mm within the margin of the keloid lesion and covering nearly half of the keloid lesion (intralesional).<sup>12</sup> It is possible to perform surgical excision both extralesionally and intralesionally. Intralesional excision refers to the excision of the central keloid while ignoring the periphery. Extralesional excision refers to the complete removal of the keloid, including its border, resulting in a larger scar.<sup>13</sup> In this case, a 1 mm incision was made intralesionally on the inside of the keloid lesion.

The epidermis and a thin layer of dermis surround the keloid in a skin flap (superkeloid flap). The skin is separated from the center of the keloid fibrous tissue. The skin flap should contain blood vessels from the subcapsular plexus. Using a scalpel, the flap can be easily separated from the core of the keloid. After completely separating the flap from the fibrous tissue, the keloid fibrous tissue is removed from its base,

leaving a thin scar of normal tissue. After trimming the skin flap, the defect is then closed with a skin flap. The wound can be sutured without excessive tension using 6-0 silk thread.<sup>12,14,15</sup> In this case, core excision was performed, followed by the closure of the wound with a keloid fillet flap.

Keloids are often difficult to treat because of keloid recurrence. The high recurrence rate of 45-100% means that an effective single treatment modality is not available and is not recommended. Surgical excision should be considered for keloids that are resistant to nonsurgical treatment modalities. Combination therapy is suggested to improve response and reduce relapse. The combination of surgical excision and intralesional corticosteroids is one of the treatment options with favorable outcomes and a recurrence rate of less than 50% over a five-year period.<sup>12</sup> patients, in this case, underwent core excision and fillet flap keloids, followed by intraoperative and immediate post-operative intralesional corticosteroid injections. Subsequently, intralesional corticosteroid injections were administered every two weeks to minimize recurrence.

Primary sutures, secondary healing, skin grafts, or local flaps may be performed after the excision of the keloid. Each approach has drawbacks. After the excision of a small keloid, primary sutures can be used to close the wound. However, keloids that require surgical excision are usually extensive. Simple sutures will increase the tension during the closure, which can lead to keloid recurrence. Secondary healing surgical procedures have a longer recovery time, and the

resulting scar can cause contractures and have a high recurrence rate. After the excision of large keloids, skin grafts or local flaps are required. On the other hand, the morphology and color mismatch of the donor area can be a new problem. To avoid this disadvantage, keloid fillet flaps or supracolloid flaps are used in this regard. In addition, Lee stated that there were subcapsular blood vessels in this fillet flap, which would promote healing. The keloid skin is also separated from the keloid mass as a flap (keloid fillet flap), and the keloid mass is completely removed.<sup>9,12,15</sup>

Surgical excision of auricular keloids is very challenging because it must maintain the three-dimensional shape of the ear cartilage and the lack of flexibility of the surrounding skin tissue.<sup>16,17</sup> If recurrence occurs, the keloid can invade more local tissue and grow to harm the underlying cartilage. Intralesional excision therapy has become a favorite in the treatment of ear keloids, where traditional scar revision can damage anatomical structures.<sup>16</sup> The Keloid center in the deepest part of the auricular keloid contains micronodules or hypercellular fibrous fascicles and a mixture of loose connective tissue rich in vascularity. These microstructures are important and are responsible for the proliferation and growth of tumor nuclei and the occurrence of local recurrence. Based on this study, it is known that complete excision of the proliferative nucleus will guarantee a lower recurrence rate in auricular keloids. Other advantages are primary closure, no visible anatomic distortion, no sacrifice of important structures, and debulking effects. In the keloid core excision technique, the skin on the keloid flap is rich in subcapsular vascular tissue.<sup>16,18</sup>

A corticosteroid injection can be used for keloid therapy in three ways: as adjuvant therapy in combination with surgery, as keloid monotherapy, or as a component of multimodality therapy to manage symptoms. Corticosteroids suppress proinflammatory cytokines and reduce fibroblast proliferation, collagen, and glycosaminoglycan synthesis. Triamcinolone acetonide is the most commonly used corticosteroid, with doses ranging from 10 to 40 mg/mL and lasting

3-6 weeks. Common side effects of triamcinolone are skin atrophy, telangiectasia, and ulceration. Post-operative keloid wounds injected with steroids directly or immediately postoperatively showed decreased transcription of collagen pro-1, which is usually associated with the incidence of skin keloids. Intraoperatively administered doses use minimally critical doses to stop the growth of keloid scars and hypertrophic scars.<sup>16</sup> The patient was managed by surgical excision using 1-2 ml of 2% lignocaine with 1:8000 adrenaline as a local anesthetic. An elliptical incision is made around the base of the scar (keloid), and then a subcutaneous excision is made through the scar tissue; the tissue removed does not extend beyond normal skin. After wound closure, triamcinolone 10-15 mg injection is performed. In this case, the patient underwent surgery using core excision and fillet flap techniques followed by injection of 40 mg/mL intralesional intraoperative and immediate post-operative corticosteroids. Postoperatively, the patient was scheduled to receive intra-lesional corticosteroid injection therapy after wound repair.

#### **4. Conclusion**

Intralesional corticosteroids may be given as part of combination therapy to prevent keloid recurrence. In addition to surgery, regular follow-up and additional therapy are needed to prevent future recurrence.

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