

Comparison of Debulking Combined with Intralesional Triamcinolone Acetonide Injection Versus Debulking Alone, for the Treatment of Earlobe and Helical Keloids

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Abstract:

Background: Keloids of the ear present a significant clinical challenge, with surgical excision alone associated with high recurrence rates (45%–100%). Various adjuvant treatments have been explored to improve outcomes, with intra-lesional corticosteroids showing promise.

Objectives: To evaluate the effectiveness and safety of debulking combined with intralesional injection of triamcinolone acetonide versus debulking alone in treating earlobe and helical keloids.

Methods: This study was conducted at the Department of Dermatology and Venereology, Baghdad Teaching Hospital, from January 2014 to October 2015. Twenty-eight female patients with 67 keloid lesions resulting from ear piercing were enrolled and randomly divided into two groups. Group 1 underwent debulking followed by intralesional injection of triamcinolone acetonide (0.25 mg to 1 mg), while Group 2 received debulking alone. The treatment response was assessed over six months using keloid height measurements, a visual analogue scale (VAS) for improvement, patient satisfaction scores, and recurrence rates.

Results: Group 1 demonstrated more significant improvement, with a mean VAS score of 8.8 ± 2.00 compared to 3.5 ± 2.63 in Group 2. Patient satisfaction was also higher in Group 1 (8.6 ± 2.38) than in Group 2 (3.5 ± 2.40). The recurrence rate was markedly lower in Group 1 (13.3%) compared to Group 2 (92.3%). No significant side effects or systemic adverse effects were observed in either group.

Conclusion: Debulking combined with intralesional triamcinolone acetonide injection is a more effective treatment for earlobe and helical keloids than debulking alone. This approach is simple, cost-effective, and well-tolerated, leading to higher patient satisfaction and significantly lower recurrence rates.

Keywords: Debulking; Ear keloid treatment; Keloid; Patient satisfaction; Recurrence; Triamcinolone acetonide.

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Introduction:

Intralesional triamcinolone acetonide (TAC) is widely recognized as a standard keloid treatment because it reduces inflammation and inhibits fibroblast proliferation, subsequently decreasing collagen synthesis(1). Research shows that TAC can significantly reduce keloid size. A randomized study indicated that 94% of treated lesions had at least a 50% reduction in size following intralesional TAC injections(2, 3). Additionally, studies suggest that intralesional TAC may be more effective than other treatments, such as silicone gel(4, 5).

Combining debulking surgery with TAC injection is proposed to enhance treatment outcomes. Surgical debulking reduces the volume of keloids, which can improve delivery and effectiveness of the intralesional therapy. Evidence indicates that this combined approach may yield better results than surgical resection

or medical treatment alone(6, 7). A review noted that patients receiving surgical excision followed by intralesional TAC reported reduced keloid size and lower recurrence rates than those treated with surgery alone(7, 8).

In the Iraqi context, the management of keloids is particularly significant, as cultural perceptions of scars can influence patients' psychological well-being. Keloids, especially in regions like the earlobe, which are prevalent among individuals in Iraq due to practices such as ear piercing or trauma, require treatment strategies that address both their physical appearance and societal implications(9). The combination of debulking and TAC represents a promising approach to meeting these needs comprehensively.

Moreover, some studies support that this dual approach significantly enhances patient satisfaction by providing quicker and more noticeable results(7, 10). Overall, while debulking surgery offers some relief,

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adding intralesional TAC can significantly improve therapeutic outcomes, making it a favorable option for Iraqi patients with keloids in sensitive areas, such as the earlobe and helix.

In summary, current evaluations comparing debulking combined with intralesional TAC to debulking alone suggest that the former not only results in superior clinical outcomes but also better addresses patients' psychosocial needs, particularly in culturally sensitive contexts like Iraq.

The current study aimed to evaluate the efficacy of debulking combined with intralesional injection of triamcinolone acetonide compared to debulking alone for treating earlobe and helical keloids

Subjects and Methods:

This study was a comparative, therapeutic, interventional, outpatient-based investigation conducted at the Department of Dermatology and Venereology, Baghdad Teaching Hospital, from January 2014 to October 2015. All participants provided informed consent after a thorough explanation of the study protocol. The Scientific Council of Dermatology and Venereology, Iraqi Board for Medical Specializations, granted ethical approval.

A total of 28 female patients with 67 keloid lesions (35 on the right side and 32 on the left side) were enrolled. All keloids resulted from ear piercing. The diagnosis was based on clinical examination, and a lesion was classified as a keloid if it exhibited at least one of the following criteria: (1) extension of the growth beyond the original wound boundaries or (2) a pseudo-tumor appearance with mounded growth and lesion distortion.

Patients were included if their keloids met the diagnostic criteria and had persisted for at least six months. The exclusion criteria comprised pregnancy or anticipated pregnancy, lactation, hepatic or renal dysfunction, active infectious diseases, known hypersensitivity to corticosteroids, and blood dyscrasia.

Each patient underwent a detailed clinical assessment, including demographic data collection, chief complaints (cosmetic concerns, itching, pain, or tenderness), disease duration, and family history of keloids. Physical examination included Fitzpatrick skin typing, and lesion height was measured using a Vernier caliper.



Figure1: Vernier Caliper

At each monthly visit, baseline and follow-up photographs were taken under standardized conditions using an iPhone 5s (8-megapixel camera).

Using the iOS-based Irandomizer program, patients were randomly assigned to one of the two treatment groups. Group 1 (Debulking + Intralesional Triamcinolone): Fifteen patients underwent surgical debulking, followed by an intralesional injection of triamcinolone acetonide immediately after surgery and at monthly intervals for up to six months. Group 2 (Debulking Only): Thirteen patients received surgical debulking alone, without corticosteroid injection.

Debulking was performed under local anesthesia using 2% lidocaine with adrenaline (1:10,000). A No. 15 scalpel was used to excise the keloid above the skin surface, and a curette was employed to remove

additional tissue from the base. A Chalazion clamp was utilized to stabilize the lesion and minimize bleeding.

In Group 1, triamcinolone acetonide (40 mg/mL; Bristol-Myers Squibb, USA) was injected into the lesion base using a 27-gauge syringe, with an administered dose ranging between 0.25 and 1 mL. The injection was given immediately post-debulking and repeated monthly for up to six months.

Patients were evaluated monthly for a maximum of six months. Treatment response was assessed based on lesion height reduction, visual analogue scale (VAS) improvement, patient satisfaction, and recurrence rates. The VAS for improvement was determined by an independent observer who evaluated baseline and six-month follow-up photographs (using iPhone 5s camera

with 8 megapixels) on a scale from 0 (no improvement) to 10 (maximum improvement). Patient satisfaction was also recorded at the end of treatment and follow-up visits, using a scale from 0 (completely dissatisfied) to 10 (fully satisfied).

Results:

There were 28 female patients, with a mean age of 22.6 ± 7.30 years in Group 1 and 24.3 ± 9.20 years in Group 2. There was no significant difference between the two groups. The duration of keloids ranged from 2 to 48 months, with no statistically significant difference between the two groups.

Cosmetic appearance was the biggest concern across all patients. However, both groups also reported additional symptoms. Group 1 had symptoms of itching ($n = 8$) or tenderness ($n = 7$), as well as cosmetic concerns. Of the symptoms observed in Group 2, six cases involved itching, and six cases included tenderness along with concerns about cosmetic appearance. Notably, one patient in Group 2 had a complaint of a purely cosmetic nature, as shown in Table 1.

Table 1: Distribution of patients by complain in both groups

Complaint	Group 1 - N = 15		Group 2 - N = 13	
	No.	%	No.	%
Itching and cosmetic complaints	8	53.3	6	46.2
Tenderness and cosmetic complaints	7	46.7	6	46.2
Cosmetic complaint only	0	0%	1	7.6%

Table 2 shows the difference between the mean keloid height between group 1 and 2 at baseline was similar. On the other hand, during the six-month follow-up period, Group 1 showed a significant reduction in lesion height, with a mean reduction of 5.7 mm from baseline, 7.9 mm, at the first visit to 2.2 mm at the final visit. In contrast, Group 2 had a modest reduction in mean high-class of 6.1 to 5.5 mm. However, the repeated measures ANOVA results remain valid, confirming that the reduction in the mean height of the lesion was statistically significant when comparing each visit separately with the 1st visit before treatment. ($p < 0.01$ for both groups) and this indicates that there was a significant reduction after 1 month of treatment with a gradual increase in size over the following visits, hence, the net reduction was very little.

Table 2: The mean height (mm) of lesions at baseline and at each visit

Study group	Month of Follow-up							p-value (ANOVA)
	1 st visit	1 st	2 nd	3 rd	4 th	5 th	6 th	
Group 1	7.9	2.5	1.9	1.6	1.8	2.1	2.2	< 0.01
Group 2	6.1	2.5	3.4	3.9	4.9	5.3	5.5	< 0.01

Table 3 presents the mean values of lesion height before and after treatment for both groups. In Group 1, there was a statistically significant decrease in mean lesion height from 7.9 mm to 2.2 mm, $p < 0.01$. In Group 2, the results also showed a reduction in height from recently treated lesions, which were 6.1 mm height before treatment and 5.5 mm after treatment.

Table 3: Comparison of the mean height of the lesions in both groups before and at 6 months after treatment

Group	Height Before Treatment	Height After Treatment	P-value (t-test)
Group 1	7.9 ± 2.37 mm	2.2 ± 0.88 mm	< 0.01
Group 2	6.1 ± 1.53 mm	5.5 ± 1.10 mm	0.147

The mean improvement scores recorded by patients in Group 1 were 8.8 ± 2.00 and significantly lower in Group 2 (3.5 ± 2.63). Likewise, Group 1 had a higher patient satisfaction score than Group 2 (8.6 ± 2.38 vs 3.5 ± 2.40). Both p-values are statistically significant, as indicated by the independent t-test, and there is a strong difference between the two groups regarding VAS improvement and patient satisfaction. This confirms that patients in Group 1 experienced significantly more improvement and satisfaction than Group 2, as shown in Table 4.

Table 4: VAS and patient satisfaction in both groups.

Groups	Visual analogue scale	Patient satisfaction
Group 1	8.8 ± 2.00	8.6 ± 2.38
Group 2	3.5 ± 2.63	3.5 ± 2.40
p-value	<0.01	<0.01



Figure 1: A female patient earlobe keloid scar, (A) before surgical excision and intralesional injection of triamcinolone acetonide, (B) and (C) after 6 months of treatment.



Figure 2: A female patient earlobe keloid scar, (A, B) before surgical excision and intralesional injection of triamcinolone acetonide, (C) and (D) after 6 months of treatment.

Discussion:

The finding of the present study found that the mean age of the two study groups was comparable aligns with other research indicating that demographic factors play a lesser role than treatment modalities in keloid treatment(12-14).

The finding that the duration of the keloid in the two study groups was comparable and consistent with previous research demonstrating that the duration of keloid formation was not significantly affected treatment outcomes(14, 15). The primary concern shared among patients in both groups was the cosmetic appearance of their keloids, underlining that aesthetic outcomes remain a key focus, as highlighted in numerous studies on keloid management(16, 17). Patient-reported symptoms such as itching and tenderness reflect the multifaceted nature of keloids, which are associated with both cosmetic and discomfort variables. These are frequently documented as common symptoms experienced by keloid patients, reinforcing the importance of effective treatment options that address appearance and improve the quality of life through symptom management(4). Integrating factors such as patient satisfaction, symptom relief, and functionality is a critical aspect of contemporary aesthetic dermatology research in assessing the overall impact of treatments(7, 18). The reduction of lesion height over time highlights that while both treatments were effective, the combined therapy resulted in significantly more significant reductions in keloid size. This finding is consistent with the literature that underscores the value of combining surgical excision with adjunct treatments, such as corticosteroid injections, in achieving better outcomes in keloid management(19-21). The results echo the efficacy of previous studies that have employed similar combined methodologies, yielding enhanced resolution of symptomatic keloids and reduced recurrence rates(22-24).

Additionally, there is evidence that intralesional corticosteroids, including triamcinolone acetonide, can significantly improve clinical outcomes for patients undergoing surgical keloid interventions(24, 25). Specifically, the use of intralesional steroid injections postoperatively helps mitigate the scarring process associated with keloid development by reducing inflammation and fibroblast activity, which are critical factors in keloid pathogenesis(26, 27). These findings contribute to the growing evidence supporting tailored, multifaceted treatment approaches for keloids that combine surgical excision with intralesional injections. They confirm the necessity of such combinations in improving patient outcomes while potentially lowering the risks of recurrence associated with surgical procedures alone(21, 22, 28).

The current study underscored significant differences in patient-reported outcomes between Group 1 and Group 2.

Average improvement scores from Group 1 were markedly higher compared to Group 2. Similarly, patient satisfaction scores favoured Group 1, with both differences achieving statistical significance. Such findings align with existing literature, emphasizing the importance of effective treatment protocols for keloids, where satisfaction and improvement are critical benchmarks in evaluating therapeutic success(29).

The observation that Group 1 manifested significantly better improvement and satisfaction can be attributed to the multifaceted approach of combining surgical and pharmacological management techniques. Prior studies have supported that adjunct therapies significantly enhance patient outcomes in keloid treatment by targeting scar height reduction and addressing psychosocial aspects like pain and discomfort(30, 31). For example, Chen et al highlighted the severe impact of pruritus and pain on the mental health of keloid patients, demonstrating that effective symptom management through pharmacotherapy is crucial for patient well-being(32). While the study yielded promising results, it had some limitations that must be acknowledged. The first limitation of this study was the small sample size. Secondly, the 6-month follow-up duration may have missed long-term recurrence rates or adverse effects of the intervention. Longer-term follow-up studies are needed to confirm the durability of these outcomes. Third, the study focused on female patients, reflecting the higher prevalence of ear piercing in our community than in males. Future studies should include males to better understand treatment effectiveness across genders better. Finally, while lesion height was the primary outcome measure, including objective measures like histological analysis or ultrasound imaging would have provided more detail on tissue response. The study's single-centre design may also lead to selection bias, while multicenter trials provide more substantial evidence.

Limitations:

This study has several limitations. Firstly, the sample size was relatively small, and the cohort consisted exclusively of female patients with piercing-related keloids, which may limit the generalizability of our findings to other populations and etiologies. Secondly, the nature of the intervention prevented blinding of patients and investigators, potentially introducing bias into the subjective patient-reported outcomes (VAS and satisfaction scores). Furthermore, the follow-up period of six months is relatively short for assessing the true recurrence rate of keloids, which often reappear after longer periods.

Conclusion:

Debulking combined with intralesional triamcinolone acetonide injection was a more effective treatment for earlobe and helical keloids than debulking alone. This approach was simple, cost-effective, and well-tolerated, leading to higher patient satisfaction and significantly lower recurrence rates.

Authors' declaration:

We confirm that all the Figures and Tables in the manuscript belong to the current study. Besides, the Figures and images, which do not belong to the current study, have been given permission for re-publication attached to the manuscript. Authors sign on ethical considerations' Approval-Ethical Clearance: The project was approved by the local ethical committee of the Scientific Council of Dermatology and Venereology, Iraqi Board for Medical Specializations according to the code number (01) on (22/11/ 2015).

Conflict of Interest: None

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Data availability: Upon reasonable request, the corresponding author will make the data sets generated and/or analyzed during the current work available.

Authors' contributions:

Study conception & design: (Hayder R. Al-Hamamy & Yasir T. Radhi). Literature search: (Hayder R. Al-Hamamy & Yasir T. Radhi). Data acquisition: (Hayder R. Al-Hamamy & Yasir T. Radhi). Data analysis & interpretation: (Hayder R. Al-Hamamy & Yasir T. Radhi). Manuscript preparation: (Hayder R. Al-Hamamy & Yasir T. Radhi). Manuscript editing & review: (Hayder R. Al-Hamamy & Yasir T. Radhi).

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مقارنة بين تقليص الحجم مع حقن أسيتونيد تريامسينولون داخل الآفة مقابل تقليص الحجم وحده لعلاج الجذرة الحلزونية في شحمة الأذن

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الخلاصة

الخلفية: تمثل الجذرات (الكيلويد) في الأذن تحدياً سريرياً كبيراً، حيث يرتبط الإستئصال الجراحي وحده بمعدلات إنتكاسة عالية (45%-100%). تم إكتشاف علاجات مساعدة مختلفة لتحسين النتائج، مع ظهور نتائج واعدة لحقن الستيرويدات داخل الآفة.
الهدف: تقييم فعالية وسلامة العلاج بالتخفيف مع حقن تريامسينولون أسيتونيد داخل الآفة مقارنة بالتخفيف وحده في علاج جذرات شحمة الأذن واللولب.
المنهجية: أجريت هذه الدراسة في قسم الأمراض الجلدية والتناسلية في مستشفى بغداد التعليمي من كانون الثاني 2014 إلى تشرين الأول 2015. شملت الدراسة 28 مريضة يعانين من 67 آفة جذرية ناتجة عن ثقب الأذن، تم تقسيمهن عشوائياً إلى مجموعتين: المجموعة الأولى خضعت للتخفيف متبوعاً بحقن تريامسينولون أسيتونيد (0.25 ملغ إلى 1 ملغ) داخل الآفة، بينما تلقت المجموعة الثانية التخفيف فقط. تم تقييم الإستجابة للعلاج على مدى ستة أشهر باستخدام قياسات إرتفاع الجذرة، ومقياس التناظر البصري (VAS) للتحسن، ودرجات رضا المريض، ومعدلات الإنتكاسة.
النتائج: أظهرت المجموعة الأولى تحسناً أكبر، حيث بلغ متوسط درجة الـ VAS 8.8 ± 2.00 مقارنة بـ 3.5 ± 2.63 في المجموعة الثانية. كما كان رضا المرضى أعلى في المجموعة الأولى (2.38 ± 8.6) مقارنة بالمجموعة الثانية (3.5 ± 2.40). كان معدل الانتكاسة أقل بشكل ملحوظ في المجموعة الأولى (13.3%) مقارنة بالمجموعة الثانية (92.3%). لم تلاحظ أي آثار جانبية كبيرة أو تأثيرات ضارة جهازية في أي من المجموعتين.
الاستنتاج: يعد الجمع بين التخفيف وحقن تريامسينولون أسيتونيد داخل الآفة علاجاً أكثر فعالية لجذرات شحمة الأذن واللولب مقارنة بالتخفيف وحده. هذه الطريقة بسيطة ومنخفضة التكلفة وجيدة التحمل، وتؤدي إلى رضا أعلى للمرضى وانخفاض كبير في معدلات الانتكاسة.
الكلمات المفتاحية: التخفيف، علاج جذرة الأذن، الجذرة، رضا المريض، الانتكاسة، تريامسينولون أسيتونيد.