

Earlobe Keloids following Multiple Earring Piercing in North-West Nigeria; Outcome of Surgical Excision with Intralesional corticosteroid and Identification of Risk Factors for Recurrence

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Abstract

Study Background: The management of earlobe keloids following multiple earring piercings poses a difficult and intriguing challenge to the patient and surgeon. It is a disfigurement with noteworthy physical and psychological burden for the female adolescent population which is worried about their appearance.

Patients and method: We retrospectively reviewed all patients with earlobe keloids treated using a protocol of surgical excision and intralesional triamcinolone injection, between 2008 and 2013. A standard form was used to collect and record data from patient files including; age, duration of keloids, age at first earring piercing, number of earring piercing, age at subsequent earring piercing, and earring piercing that developed a keloid. Treatment outcome was recorded as recurrence or non-recurrence.

Results: One hundred and eight earlobe keloids in sixty patients were treated with our protocol. Forty two (70%) patients had two earring piercings on the earlobe. Age at first earring piercing on the ear lobe was before the age of one year in the majority of the patients. 58 (97%). The second and third earring piercing was associated with formation of keloids in 49 (82%) and 9(15%) patients respectively. Four patients had de-pigmentation of the earlobe, and one patient had a minor wound dehiscence while another had a mild postoperative wound infection. Recurrence occurred in 16 patients (27%). Recurrence was significantly associated with the number of earring piercing, age at first earring piercing, age at subsequent earring piercing, earring piercing that developed a keloid and family history of keloids.

Conclusion: A combination of intramarginal excision and post-operative intralesional injection of triamcinolone is effective for the management of earlobe keloids. The results of this study suggests that multiple ear ring piercings should be discouraged after the age of puberty or perhaps not at all in patients with a family history of keloids.

Keywords: Earlobe; Keloids; Earrings; Recurrence; Intramarginal excision; Triamcinolone

Introduction

The auricle is a unique aesthetic unit and it contributes significantly to the symmetry and harmony of the face [1,2]. The earlobe is the non cartilaginous, pendulous end of the auricle [3]. Its anatomic free edge, distinct shape, and lack of cartilage, makes it a popular location for earring piercing [1,3]. Ear piercing is the most popular form of body piercing. It has a long and distinguished history across many tribal cultures. From a time honored method of expressing individuality, to a demonstration of religious devotion, and more recently as a fashionable method of body ornamentation [1,4-6]. However what was once considered traditional, single hole earring piercings, has been replaced with multiple ear piercings, with many women choosing to wear two or more earrings in each earlobe [6,7].

The earlobe is a location with a high risk of keloid scar formation especially in darker skin types [4,5,8-10]. Inflammation from infection, excessive wound tension, or foreign material are well-accepted factors involved in keloid formation. Contact allergy to nickel or other impurities in earrings has also been implicated [11]. It is a disfigurement with noteworthy physical, emotional and psychological burden especially for the female adolescent population which is worried about their appearance [12-14]. Treatment remains a significant challenge requiring the plastic surgeon to seek creative reconstructive options [11,15-17].

Numerous treatment options have been proposed for earlobe keloids, suggesting that no single method is considered as the accepted standard. Surgical excision, corticosteroid injection, pressure earrings, radiation therapy, carbon dioxide laser, and silicone gel have been

attempted with varying degrees of success for the treatment of earlobe keloids [10]. Earlobe keloids have been treated using surgical excision alone with a recurrence rate of 60%. A review of the literature shows that one of the commonest modality of treatment is the combination of surgical excision and intralesional steroid injection, which yields a lower recurrence rate [2,18,19]. There is a paucity of literature on the treatment outcome of earlobe keloids following multiple ear ring piercing in Nigeria and indeed sub-Saharan Africa. The purpose of this study is thus twofold: (1) to assess the outcome of intramarginal excision combined with intralesional triamcinolone injection, and (2) to identify risk factors for recurrence.

Patients and Method

This is a retrospective study of patients with earlobe keloids treated using a protocol of surgical excision and intralesional triamcinolone injection, between 2008 and 2013. Earlobe keloids were diagnosed clinically as an elevated scar extending beyond the dimensions of the earring opening (Figure 1). The inclusion criteria include all earlobe

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Figure 1: Earlobe keloids extending beyond the dimensions of the earring opening.

keloids treated by means of intramarginal excision and a minimum of four postoperative injections of intralesional triamcinolone. Patients with keloids affecting the cartilaginous portion of the ear and a previous history of treatment for ear lobe keloids were excluded from the study. A standard form was used to collect and record data from patient files including: age, duration of keloids, age at first earring piercing, number of earring piercing, age at subsequent earring piercing, and earring piercing that developed a keloid. The gross morphology of the earlobe keloid was according to the Chang-Park classification [20]. Treatment outcome was recorded as recurrence or non-recurrence. Recurrence was defined as continued growth or presence of a nodule extending beyond the borders of the healed scar line of the previously excised lesion. Non recurrence was defined by the absence of a swelling in a well-healed scar following excision and postoperative injections [22]. Mann-Whitney and Chi-square tests were used to assess differences between continuous and categorical variables respectively. SPSS version 18 was used to analyze data. A value of p less than 0.05 was considered significant.

Surgical Technique

The procedure was performed under local anesthesia in all the patients. The periphery of the keloid was infiltrated with a local anesthetic (0.5% lidocaine with 1:200,000 epinephrine). This facilitates dissection in a bloodless surgical field. An intra-marginal excision was done. An incision is made within the edge of the keloid and the marginal skin of the overlying keloid, is dissected from the underlying keloid. The keloid is excised and the marginal skin is trimmed appropriately. The edges of the residual rim of keloid are meticulously approximated with 4-0 nylon (simple interrupted sutures) and a dressing is applied. Sutures are removed after one week and the injection of 40 mg triamcinolone into the residual rim of keloid, is commenced at 2 weeks post-operation. This is repeated at fortnightly intervals. A maximum of six injections is given. All specimens were sent for pathologic evaluation and were confirmed as keloids.

Results

The patients' ages ranged from 15 to 34 years (mean age 22 years) (Table 1). At the time of treatment the lesions have been present from 6 to 54 months (mean 23 months). One hundred and eight earlobe keloids were treated in sixty patients. Forty eight patients (80%) had bilateral earlobe keloids. Five patients had keloids on the right earlobe and seven patients had keloids on the left earlobe. The size of lesions ranged from 0.5 cm to 4.0 cm with a mean diameter of 2.5 cm.

Forty two (70%) patients had two earring piercings on the earlobe while 3 patients (5%) had 3 earring piercings. Age at first earring piercing on the ear lobe was before the age of one year in the majority

Variable	Number (%)	
No of patients	60	
Mean age (years)	22 (15-34)	
Duration of keloids (months)	23 (6-54)	
Maximal diameter (cm)	2.5 (0.5-4)	
Number of earring piercing		
1	15	25
2	42	70
3	3	5
Age at first earring piercing (years)		
< 1	58	97
1 – 12	2	3
Age at subsequent earring piercing (years)		
1 – 12	2	3
13 - 18	52	87
>18	6	10
Earring piercing that developed a keloid		
1 st	2	3
2 nd	49	82
3 rd	9	15
Unilateral keloids	12	20
Bilateral keloids	48	80
Family history of keloids		
Yes	14	23
No	46	77
Other keloids		
Yes	22	37
No	38	63

Table 1: Demographic variants and characteristics of patients with earlobe keloids.

Classification	Number (%)	
Type IA	19	18
Type IB	18	17
Type IC	36	33
Sessile, single nodular pattern, Type II	15	14
Sessile, multinodular pattern, Type III	15	14
Buried, Type IV	1	0.9
Mixed, Type V	4	4
Total	108	(100)

Table 2: Chang-Park Classification of earlobe Keloids.

of the patients. 58 (97%). Subsequent earring piercings were between the age of 12 and 18 years in 52 patients (87%) while six patients (10%) had subsequent earring piercing after the age of 18 years. The second and third earring piercing was associated with formation of keloids in 49(82%) and 9(15%) patients respectively. Thirty eight patients (63%) had keloids at other sites and there was a family history of keloids in forty six patients (77%) (Table 1). The commonest morphology of the earlobe keloids was type 1C in thirty six patients 33% (Table 2). Preoperative and postoperative photographs of Type 1C earlobe keloids (Figures 2-4).

Seven (12%) postoperative complications were noted; among them were one patient with scar widening postoperatively, four patients with de-pigmentation of the earlobe, and one patient with a minor wound dehiscence and another who had a mild postoperative wound infection. All the complications responded to conservative measures and no secondary procedure was required. Long-term follow-up was documented in 51 patients (85%), with nine patients lost after a 6-month follow-up period. The average follow-up period was 2 years (range, 0.5 to 5 years).

Recurrence occurred in 16 patients (27%). Patient demographics and keloid characteristics were evaluated as possible risk factors for recurrence of earlobe keloid (Table 3). Recurrence was significantly associated with the number of earring piercing, age at first earring



Figure 2: Preoperative and postoperative photographs of Type 1C earlobe keloids.



Figure 3: Preoperative and postoperative photographs of Type 1C earlobe keloids.



Figure 4: Preoperative and postoperative photographs of Type 1C earlobe keloids.

Variable	Non recurrence	Recurrence	p value
No of patients	44	16	
Mean age (years)	18 (14-24)	17 (12-19)	0.135
Duration of keloids, months	23 (6-54)	20 (6-54)	0.311
Maximal diameter, cm	2 (0.5-4)	1.5(0.5-4.0)	0.874
Number of earring piercing			
1	14 32	1	< 0.05
2	28 64	14 94	
3	2 5	1	
Age at first earring piercing (years)			
< 1	43 98	15 94	< 0.05
1 – 12	1 2	1 6	
Age at subsequent earring piercing (years)			
1 – 12	2 5	15 94	< 0.05
13 - 18	37 84	1 6	
>18	5 11		
Earring piercing that developed a keloid			
1 st	1 2	1 6	< 0.05
2 nd	35 80	14 88	
3 rd	8 18	1 6	
Unilateral keloids	6 14	6 38	0.264
Bilateral keloids	38 86	10 63	
Family history of keloids			
Yes	2 5	12 75	< 0.05
No	42 95	4 25	
Other keloids			
Yes	8 18	14 88	0.174
No	36 82	2 12	

Table 3: Demographic variants and earlobe keloid characteristics between recurrence and non-recurrence groups.

piercing, age at subsequent earring piercing, earring piercing that developed a keloid, and family history of keloids. There were no statistically significant associations on earlobe keloid recurrence for patient age, size and duration of earlobe keloids as well as presence or absence of other keloids (Table 3).

Discussion

Ear lobe piercing is common and multiple piercings on the earlobe has recently gained popularity. The practice of ear piercing while generally safe, nevertheless has complications ranging from a minor tear to severe infections and keloid formation [4,5,23]. The incidence of earlobe keloids following earlobe piercing has been estimated to be as high as 2.5 percent [12].

There are trends in the literature that accord to ethnicity and age at ear ring piercing on keloid scarring of the earlobe [12]. The incidence of keloids in darker-skinned individuals especially those of African descent is estimated to be 15 to 20 times higher than those with a lighter skin pigmentation [18,20]. In-addition, the increased incidence of keloids in puberty confers a higher risk to ear piercing in adolescence [5]. The results of this study suggest similarities with the demographic pattern described in earlier studies. 87% of the patients had either a second or third ear ring piercing between the ages of 13 and 18 years and 97% developed an ear lobe keloid. . A recent study reported age as a risk factor. 75% of patients developing earlobe keloids had their first piercing performed at > 11 years of age. Amongst those whose first piercing was done before the age of eleven, it did not result in a keloid, however a keloid developed in 92.3% following a second piercing above the age eleven years [23]. Age is generally accepted as a significant risk factor for the development of keloids during and after puberty because of these observations [5,23]. This has been associated with endocrine factors and increased pituitary activity in puberty [23]. This has been

associated with endocrine factors and increased pituitary activity in puberty [23]. The increasing trend for cosmetic piercing, and for multiple earlobes piercing, suggests that earlobe keloids will become a more frequent part of plastic surgery practice [12].

The effective management of the symptomatic and psychosocial burden on patients remains challenging [25]. Overall, published data seem to confirm that a combination of surgical excision and postoperative injection of triamcinolone acetonide is effective for the treatment of earlobe keloids [11,25]. Intramarginal excision is documented to have an acceptable outcome and fewer recurrences. The rim of the keloid splints the wound and relieves tension, thus decreasing the stimulus for collagen synthesis.

The use of corticosteroid injections as an adjunctive procedure after keloid excision had been reported using various schedules, dosages and concentrations of drug [21]. It has a low morbidity, it is easy to administer and provides consistently reliable and durable results [16]. Corticosteroids work by decreasing collagen synthesis and limiting fibroblast proliferation [16]. This could be a result of fibroblast hypoactivity, a reduction in fibroblast density, or even a maturation modification of these cells. Additionally, it has been noted that corticosteroids provoke a decrease in new endothelial buds from blood vessels [26]. Complications of repeated triamcinolone acetonide injections include skin atrophy, de-pigmentation, telangiectases, wound dehiscence, and Cushing's disease [27]. These adverse effects are all significantly minimized by intralesional application of a low-dose depot preparation [16,28]. The four patients who experienced de-pigmentation in this study reported a return to normal pigmentation over time.

Given the cosmetic deformity and psychological trauma associated with earlobe keloids, an understanding of risk factors for recurrence is imperative to provide optimal treatment [29]. Keloids of the earlobe have a higher recurrence rate than any other anatomical region [12]. The recurrence rate in this study is 27%. This is higher than the recurrence rate of 16.6% reported by Jung et al. [21]. It is however lower than the 58% in the study by Berman et. al. [27]. Recurrence after surgical excision and intralesional triamcinolone is understood to be due to persistence of the same genetic abnormalities which cannot be completely reversed [19]. Other purported risk factors for the development of recurrence include ethnic background (African or Asian descent) and tension across suture lines [10]. While genetic factors and ethnicity are un-modifiable risk factors, it is possible that tension on the suture line, immune response and fibroblast activity can be modified [24]. A meticulous technique in surgical excision is thus considered critical to reduce recurrence. Halsted's principles of "surgical bliss" in wound closure are aptly summarized by the mnemonic H1A5: Homeostasis, Asepsis, A traumatic technique, Absence of raw surface, Avoidance of tension, and accurate approximation of wound margin [17,18]. Our protocol offers some advantages. Following intramarginal excision, healing is by primary intention. There are no raw surfaces that may result in infection or scar contracture and promote recurrence. The average size of the earlobe keloids was 2.5cm and primary closure does not produce tension at the suture site [2,17].

In this study, recurrence was not statistically associated with age, size of earlobe keloid and presence or absence of keloids in other parts of the body. This is consistent with the results of previous studies. An earlier report showed that there were no significant differences in recurrence rates of earlobe keloids with respect to age, how long the earlobe had been pierced, keloid size, and elapsed time at keloid presentation [17]. In this study, 75% of patients with a recurrence had

a positive family history, whereas 50% of patients in a study by Bayat et al. [30] had a positive family history. Family history is reported to be important in predicting recurrence [18,19]. These suggest that parents with a positive family history of keloids should consider having their children's earlobes pierced in infancy. Furthermore, multiple earring piercings on the earlobes should be discouraged after the age of puberty or perhaps not at all in patients with a family history of keloids [31]. Ear piercing is usually done for cosmetic reasons, and if patients at higher risk were informed or identified beforehand, they could avoid the cosmetic embarrassment and recurrence associated with earlobe keloids [32].

Conclusion

Earlobe keloids following multiple earring piercings are a frequently encountered problem. It is associated with cosmetic deformity and psychological trauma to the patient, because of their highly visible location. A combination of intramarginal excision and post-operative intralesional injection of triamcinolone is effective for the management of earlobe keloids. Recurrence was significantly associated with the number of earring piercing, age at first earring piercing, earring piercing that developed a keloid and family history of keloids. The results of this study suggests that multiple ear ring piercings should be discouraged after the age of puberty or perhaps not at all in patients with a family history of keloids.

References

1. Yotsuyanagi T, Yamashita K, Sawada Y (2002) Reconstruction of congenital and acquired earlobe deformity. *Clin Plast Surg* 29: 249-255.
2. Qi Z, Liang W, Wang Y, Long X, Sun X et al. (2012) X-Shaped Incision and Keloid Skin-Flap Resurfacing: A New Surgical Method for Auricle Keloid Excision and Reconstruction. *Dermatol Surg* 38: 1378-1382.
3. Ogawa R, Huang C, Akaishi S, Dohi T, Sugimoto A et al. (2013) Analysis of Surgical Treatments for Earlobe Keloids: Analysis of 174 Lesions in 145 Patients. *Plast Reconstr Surg* 132: 818e-825e.
4. Fijalkowska M, Kasielska A, Antoszewski B (2014) Variety of complications after auricle piercing. *Int J Dermatol* 53: 952-955.
5. Lane JC, O'Toole G (2012) Complications of ear rings. *J Plast Reconstr Aesthet Surg* 65: 747-751.
6. Stirn A (2003) Body piercing: medical consequences and psychological motivations. *The Lancet* 361: 1205-1215.
7. Waugh M (2007) Body piercing: where and how. *Clin Dermatol* 25:407-411.
8. Aköz T, Gideroğlu K, Akan M (2002) Combination of different techniques for the treatment of earlobe keloids. *Aesthetic Plast Surg* 26:184-188.
9. Arneja JS, Singh GB, Dolynchuk KN, Murray KA, Rozzelle AA et al. (2008) Treatment of recurrent earlobe keloids with surgery and high-dose-rate brachytherapy. *Plast Reconstr Surg* 2008 121:95-99.
10. Park TH, Chang CH (2013) Early postoperative magnet application combined with hydrocolloid dressing for the treatment of earlobe keloids. *Aesthetic Plast Surg* 37:439-444.
11. Music EN, Engel G (2010) Earlobe keloids: a novel and elegant surgical approach. *Dermatol Surg* 36:395-400.
12. Stahl S, Barnea Y, Weiss J, Amir A, Zaretski A et al. (2010) Treatment of earlobe keloids by extralesional excision combined with preoperative and postoperative sandwich radiotherapy. *Plast Reconstr Surg* 125:135-141.
13. Bejarano SM, Parri Ferrandis FJ, García Smith NI, Martínez-Herrada S, Manzanares QA et al. (2014) Keloid scars of the external ear: a non solved problem. *Cir Pediatr* 27(1):21-25.
14. Smith OJ, McGrouther DA (2014) The natural history and spontaneous resolution of keloid scars. *J Plast Reconstr Aesthet Surg* 67: 87-92.
15. Malaker K, Zaidi M, Franka MR (2004) Treatment of earlobe keloids using the cobalt 60 teletherapy unit. *Ann Plast Surg* 52: 602-604.

16. Rosen DJ, Patel MK, Freeman K, Weiss PR (2007) A primary protocol for the management of ear keloids: results of excision combined with intraoperative and postoperative steroid injections. *Plast Reconstr Surg* 120:1395-1400.
17. Kim DY, Kim ES, Eo SR, Kim KS, Lee SY et. al. A surgical approach for earlobe keloid: keloid fillet flap. *Plast Reconstr Surg* 2004; 113:1668-1674.
18. Al Aradi IK, Alawadhi SA, Alkhwaja FA (2013) Earlobe Keloids: A Pilot Study of the Efficacy of Keloidectomy with Core Fillet Flap and Adjuvant Intralesional Corticosteroids. *Dermatol Surg* 39:1514-1519.
19. Park TH, Park JH, Tirgan MH, Halim AS, Chang CH (2014) Clinical Implications of Single-Versus Multiple-Site Keloid Disorder. *Ann Plast Surg*.
20. Park TH, Seo SW, Kim JK, Chang CH (2012) Earlobe keloids: classification according to gross morphology determines proper surgical approach. *Dermatol Surg* 38: 406-412.
21. Jung JY, Roh MR, Kwon YS, Chung KY (2009) Surgery and perioperative intralesional corticosteroid injection for treating earlobe keloids: a Korean experience. *Ann Dermatol* 21: 221-225.
22. Park TH, Park JH, Kim JK, Seo SW, Rah DK et. al. (2013) Analysis of 15 cases of auricular keloids following conchal cartilage grafts in an asian population. *Aesthetic Plast Surg* 37:102-105.
23. Bashir MM, Afzal S, Khan FA, Abbas M (2013) Factors Associated with Postpiercing Auricular Cartilage Keloids. *J Coll Physicians Surg Pak* 21:606-610.
24. Khare N, Patil SB (2012) A novel approach for management of ear keloids: Results of excision combined with 5-fluorouracil injection. *J Plast Reconstr Aesthet Surg* 65: e315-e317.
25. Careta MF, Fortes AC, Messina MC, Maruta CW (2013) Combined Treatment of Earlobe Keloids with Shaving, Cryosurgery, and Intralesional Steroid Injection: A 1-Year Follow-Up. *Dermatol Surg* 39: 734-738.
26. Hochman B, Locali RF, Matsuoka PK, Ferreira LM (2008) Intralesional triamcinolone acetonide for keloid treatment: a systematic review. *Aesthetic Plast Surg* 32:705-709.
27. Berman B, Flores F (1997) Recurrence rates of excised keloids treated with postoperative triamcinolone acetonide injections or interferon alfa-2b injections. *J Am Acad Dermatol* 37:755-757.
28. Darzi MA, Chowdri NA, Kaul SK, Khan M (1992) Evaluation of various methods of treating keloids and hypertrophic scars: a 10-year follow-up study. *Br J Plast Surg* 45:374-379.
29. Park TH, Seo SW, Kim JK, Chang CH (2011) Outcomes of surgical excision with pressure therapy using magnets and identification of risk factors for recurrent keloids. *Plast Reconstr Surg* 128:431-439.
30. Bayat A, Arscott G, Ollier WER, Mc Grouther DA, Ferguson MWJ (2005) Keloid disease: clinical relevance of single versus multiple site scars. *Br J Plast Surg* 58:28-37.
31. Lane JE, Waller JL, Davis LS (2005) Relationship between age of ear piercing and keloid formation. *Pediatrics* 115:1312-1314.
32. Gauthf CN, Pritzker AS, Davis L (1996) Survey of informed consent for ear piercing: risk of keloids. *Pediatr Dermatol* 13:430.