Earlobe Keloid Management- A RCT of Intra-Lesional Excision With Intra- & Post-Operative Steroids Versus Intra-Lesional Excision With Post-Operative Steroids

PC Dash[a], MM T Islam[b], MS Khondoker[c], SH Khundkar[d],

Abstract:

A prospective, randomized controlled trial was designed to compare the outcome of earlobe keloid management by intra-lesional excision with intraoperative and two dose post-operative steroid injections versus intra-lesional excision with two doses post-operative steroid injections. Total 87 patients having 100 earlobe keloids were enrolled in the study with 50 keloids in each group allocated by lottery, but only 69 completed two years follow up. The age of the patients ranged from 15 to 40 years and all were female. Trauma from piercing ear lobule for earring was the main cause of keloid initiation. Both the groups were homogeneous preoperatively regarding age of patients, pre-operative volume of keloids, pattern of previous treatment received, patient's skin complexion and patient's family history of keloid.

Intra-lesional excision keeping 1mm margin followed by intra-operative steroid injection was given in one group and without steroid injection in other group. Residual keloid volume (length, Breath, and height) was measured intra-operatively and post-operatively during follow up period by blindfolded observers. Any symptomatic relief as well as local and systemic side effects of steroids were also recorded.

Main observation of this study after two years was 8.3% recurrence in intra-lesional excision with intra-and two dose post-operative steroid injections and 21.2% recurrence in intra-lesional excision with two dose post-operative steroid injections. This difference was not statistically significant (p = 0.177). But, the former protocol reduced recurrence significantly during 1st one year follow up. Residual keloid volume reduction was faster in former protocol in early post-operative period, but not in later period. Symptomatic improvement was also faster in the former protocol, in early post-operative period, but no difference in later period. Local side effects and systemic side effects of steroid were more or less equal in both protocols.

The study demonstrates that additional intra-operative steroid injection has better effect in early post-operative period in managing earlobe keloid, but has no significant effect in long term follow up.

Introduction:

Keloids of ear is one of the most trying challenges faced by surgeon. No other cutaeneous disease seems to create so much disagreement on the treatment as do these lesions. Many treatment modalities have been described including simple excision, local irradiation, steroid therapy, pressure therapy, cryotherapy, silicone gel, and enzyme therapy.[1] Steroids have been tried in different ways for treatment of keloids.[2] These have been used either alone or in combination with surgery and radiotherapy with varying results.[3] Again there is controversy about dosing and timing of steroid. Infrequent dosing results in high recurrence whereas over dosing result in serious wound infections as well as other local effects like dermal atrophy, depigmentation and telangiectasia due to inadvertent introduction into surrounding skin.[4] So, primary determinant in choosing a treatment protocol should be a low recurrence rate with minimum untoward effects. The present study was undertaken with a view to evaluate the effect of an additional intra-operative steroid beyond two dose post-operative steroids.

a. Dr. Pradip Chandra Dash, HMO Department of Plastic Surgery, Dhaka Medical College and Hospital

b. Dr. Mirza Mohammad Tyeabul Islam, Medical Officer, Department of Plastic Surgery, Dhaka Medical College and Hospital

c. Dr. Md. Sazzad Kondoker, MS (G.Surgery), FCPS (Surgery), MS (Plastic Surgery), Associate Professor, Department of Plastic Surgery, Dhaka Medical College and Hospital

d. Prof. Shafquat Hussain Khundkar, FCPS(Surgery), FICS(Plastic Surgery), Professor and Head of Department of Plastic Surgery, Dhaka Medical College and Hospital

Address of correspondence: Dr. Pradip Chandra Dash, HMO Department of Plastic Surgery, Dhaka Medical College, Dhaka. e-mail: drpcdash77@gmail.com.

Methods and Materials:

The study was carried out in Dhaka Medical College Hospital in the department of Plastic and Reconstructive Surgery during January 2007 to December 2009. Patients above 14 years of age having earlobe keloids irrespective of previous treatment were target population for the study. Keloids which were treated by steroid injection or surgery within 6 months or treated with abnormal surrounding skin like dermal atrophy, hypopigmentation and telangiectasia were excluded from the study. Again, very large keloids where complex reconstruction required were also excluded. Besides, patients with known systemic diseases like diabetes mellitus, Cushing syndrome, chronic renal failure, and chronic liver failure were excluded. Thus, finally 87 patients having 100 earlobe keloids were enrolled in the study having 50 in each groups randomly allocated by lottery. Group-I: keloids treated by intra-lesional excision with intra- and two dose post-operative steroid injections and group-II: keloids treated by intra-lesional excision with two dose post-operative steroid injections.

In both the groups, full thickness excision of the keloid was done just within 1 mm margins under local anesthesia. In group-I, the standard 'Triamcinolone acetate' injection (40mg/ml ×1ml mixed with 1ml of 2% xylocaine) was used in the residual keloid margins after closure. The dose of steroid was 20 mg/cm^2 of residual keloid.[5] In group-II, after excision wound was closed by similar technique without triamcinolone acetate injection. In all cases, residual keloid volume was measured after closure (but before triamcinolone injection in group-I). Residual keloid was treated further with steroid injection on 14th post-operative day and then on 45th post-operative day. 1s±t visit was 45 days after surgery; 2nd, 3rd, 4th, 5th visits were three months interval; 6th and 7th visits were six months interval. During each visit measurement of residual volume of keloid (length, breath and thickness) was done with slide caliper by blindfolded observers. Any symptomatic relief as well as local and systemic side effects of steroids was also noted.

Results:

All the patients were female and their age range was 15 to 40 years. The highest percentage of the patients was in the age group 20-24 years (27.6%) . Majority of the keloids started by trauma from piercing earlobe for earring 71.3% followed by 20.7% by infection. However, 8% had no known reason. Family history of keloid was positive in 5.7% patients. More than two-thirds (70%) had fair skin complexion and 18.4% had brown complexion and 8% had black complexion. Most of the keloids (74%) were recurrent cases. There was no statistical significant difference among the two groups regarding demographic variables stated above (See table-1, 2).

The preoperative volume of the keloid was 14.6 ± 13.0 cm^3 in the group-I and 12.7 ± 7.1 cm^3 in the group-II. Regarding preoperative symptoms, keloids of group-I had 72% itching and 40% tenderness and that of group-II was 74% and 36% respectively. Also, the difference was not statistically significant p>0.05 .

Table-1: Distribution of the patients by keloid specific variables (N=87).

Variables	Group				Total (n=87)		p value
	Group-I (n=43)		Group-II (n=44)				
	No.	(%)	No.	(%)	No.	(%)	
Family history							
Yes	2 (4.7)		3 (6.8)		5 (5.7)		0.979
No	41 (95.3)		41 (93.2)		82(94.3)		
Skin complexion							
Black	3 (7.0)		4 (9.1)		7 (8.0)		0.905
Brown	9 (20.9)		10 (22.7)		19(21.8)		
Fair	31 (72.1)		30 (68.2)		61(70.1)		
White	0 (0.0)		0 (0.0)		0 (0.0)		
Site of keloid							
Unilateral	36(83.7)		38 (86.4)		74(85.1)		0.750
Bilateral	7 (16.3)		6 (13.6)		13(14.9)		

*p value reached from Chi square test

Table-2: Distribution of keloids by how started and previous treatment received (N=100).

Variables	Group				Total (n=100)		p value
	Group-I (n=50)		Group-II (n=50)				
	No.	(%)	No.	(%)	No.	(%)	
How started							
Trauma	36(72.0)		33 (66.0)		69(69.0)		0.407
Infection	10(20.0)		15 (30.0)		25(25.0)		
Unknown	4 (8.0)		2 (4.0)		6 (6.0)		
Previous treatment received							
Steroid	16(32.0)		15 (30.0)		31(31.0)		0.930
Surgery	20(40.0)		18 (32.0)		38(38.0)		
Both	3 (6.0)		4 (8.0)		10(10.0)		
None	11(22.0)		13(26.0)		26(26.0)		

*p value reached from Chi square test

After two years follow up 58 patients having 69 keloids completed the study. 13 keloids in group-I and 17 keloids in group-II were dropped during follow up and 1 was omitted from the study. Patient which lost at least one follow up, considered as dropped case. Omitted one was due to total disruption of wound resulted from accidental rubbing with pillow at night during sleeping (as per patient's statement) and that was in group-I.

The proportion of recurrence was found to be high among the group-II keloids 18.2% compared to group-I keloids 2.8% in 1st one year follow up and the difference was statistically significant p= 0.049 . In a total follow up of two years till higher (21.2% in group-II and 8.3% in group-I), but the difference was not statistically significant (p= 0.177).

Table -3: Distribution of timing of keloid recurrence (N=10).

Study duration	Visits	Group				Total (n=10)	
		Group-I (n=3)		Group-II (n=7)			
		No.	(%)	No.	(%)	No.	(%)
1st year	1st visit	0	(0.0)	0	(0.0)	0	(0.0)
	2nd visit	0	(0.0)	3	(42.9)	3	(30.0)
	3rd visit	0	(0.0)	2	(28.6)	2	(20.0)
	4th visit	1	(33.3)	1	(14.3)	2	(20.0)
	5th visit	0	(0.0)	0	(0.0)	0	(0.0)
2nd year	6th visit	1	(33.3)	0	(0.0)	1	(10.0)
	7th visit	1	(33.3)	1	(14.3)	2	(20.0)

Reduced rate of post-operative residual volume of non recurrent keloids revealed that statistically significant difference was found between the two groups of keloid in 1st and 2nd visits. However, during subsequent follow up visits no statistically significant difference was found between the two groups of keloids.

Proportion of itching and tenderness significantly decreased in the both groups in post-operative period from early 1st visit. In comparison between the two groups, the proportion of itching was found to be high among the group-II compared to group-I and the difference was statistically significant in 1st and 2nd visits p<0.05 , however, no statistically significant difference was found between the two groups of keloids in other visits p>0.05 . It was also found that none of the keloids had itching or tenderness in 4th and 5th visits, but again developed from 6th visit.

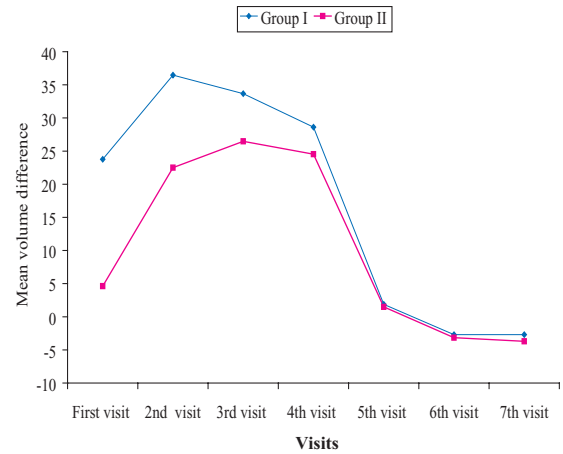


Diagram-1: Postoperative residual keloid volume reduction in successive visits of two groups (Non recurrent).

Only 1 keloid developed hypopigmentation, and 1 dermal atrophy in group-II. On the other hand, 1 hypopigmentation and 1 delayed wound healing (more than 10 days developed in group-I. Hypopigmentation and dermal atrophy was improved within two years of follow up but not completely. Out of fifty-eight patients who completed two years follow up, one patient developed transitory menorrhagia.

Discussion:

Earlobe keloids are known to every surgeon, but their aetiology remains obscure and their treatment controversial. The incidence varies from race to race. Black people and Asian people are more likely to develop these lesions than Caucasians, the incidence varying from 5:1 to 15:1.[6] Many treatment modalities have been advocated but none have been universally successful. Pressure therapy, Cryotherapy and Radiation are recommended but with some limitation due to complication. Surgery alone has a high recurrence rate (55%).[7] It has been recommended as a second-line therapy for lesions that do not respond to steroids and pressure, and large lesions requiring debulking.[8] Intra-lesional steroid therapy is now a mainstay of therapy. Steroids are believed to act decreasing the level of collagenase inhibitors, thereby increasing collagen degeneration.[9] Early application of steroids in the wound has anti- inflammatory effects which decreases fibroblast and collagen release.[10]

Among various combination therapy, surgery with steroid injection in the residual wound rim is now

common practice.[8] One of the advantage of this combination therapy is to prevent the wide scar which otherwise results by using intra-lesional steroids alone without excision. In earlobe keloid, steroid alone even when successful leaves an unsightly, pendulous remnant behind.[11] Intra-lesional steroids have been used pre-operatively, post-operatively as well as peroperatively. So, timing of steroid with surgery as well as dose frequncy in the post-operative period is a matter of question. Some protocols recommended an intra-operative followed by single dose post-operative, some intra-operative and two or three doses post-operative while others intra-operative first dose followed by 4-6 weekly injections for 6-10 months [12,13,14].

The present study showed 8.3% recurrence in group-I and 21.2% recurrence in group-II from two years follow up. The difference was not statistically significant (p=0.177). But, during 1st one-year follow up, prior protocol (group-I) showed statistically significant difference (P=0.049). Rosen et al., in a study of 64 patients representing 92 earlobe keloids treated by excision with an intra-operative and two post-operative steroid injections with a minimum of 5 years follow up and found 23% recurrence.[12] Recurrence rate of this study could be higher from a longer follow up as there was recurrence even in last visit. In another study on 12 patients with a total of 19 earlobe keloids treated by intra-lesional surgical excision with intra-operative and a single dose post-operative steroid injection found 5% keloids required additional doses in a follow up of 6 months to 4 years.[13] A 6 months follow up for earlobe keloid was too shorter because after a quiescent period recurrence appeared in present study (see table-3). Shons & Press, carried out a study on 31 earlobe keloids in 20 patients, treated by complete surgical excision and three doses of post-operative triamcinolone injections at four-week intervals beginning three weeks post-operation and had 1 (9.4%) recurrence in a follow-up of 12-62 months.[14] They did not show yearly recurrence and follow up was not uniform to compare with this study though group-I of this study had nearly equal recurrence rate.

So, the rate and pattern of recurrence and pattern of residual volume reduction in two groups shows that additional intra-operative steroid has short-term better effect in early post-operative period possibly due to anti-inflammatory effects of streoid which decreases fibroblast and collagen release in the healing phase of wound.[10]

Significant symptomatic (itching and tenderness) improvement occured in both the groups after treatment. In comparison between two groups of nonrecurrent keloids, group-I showed statistically significant ($p<0.05$) faster improvement in first 4½ months after surgery than group-II. Symptoms totally disappeared 6 months after surgery and there was a symptom free period in both groups. Symptoms reappeared in the last one year of follow up, but in a very low percentage of cases. So, pattern of symptomatic improvement also supports that additional intra-operative steroid reduces symptoms faster in early postoperative period, but effect is same in long-term follow up.

Regarding local side effects, both groups were more or less same. Only 1 patient in group-I showed delayed wound healing (2.8%). So, intra-operative intra-lesional steroid in thepapeutic dose has no significant negative wound healing effect. None of the cases of both groups showed any serious systemic side effects except one transitory menorrhagia (1.7%). Chowdri et al., found infection 1.73%, hypopigmentation 1.73% and dermal atrophy 1.73%. Among systemic side affects menorrhagia 12% and Cushingoid features 6.89% were noted though both were transitory.[15] They used intra-operative and serial post operative steroid injections. So, this can be said that multiple post-operative dose increases risk of local and systemic side effects.

Conclusion:

It is obvious that additional intra-operative steroid injections, that was used in group-I, has better effect in early post-operative period, but not in respect of long-term outcome. Another important observation is that in therapeutic dose intra-operative steroid has no significant negative wound healing effect.

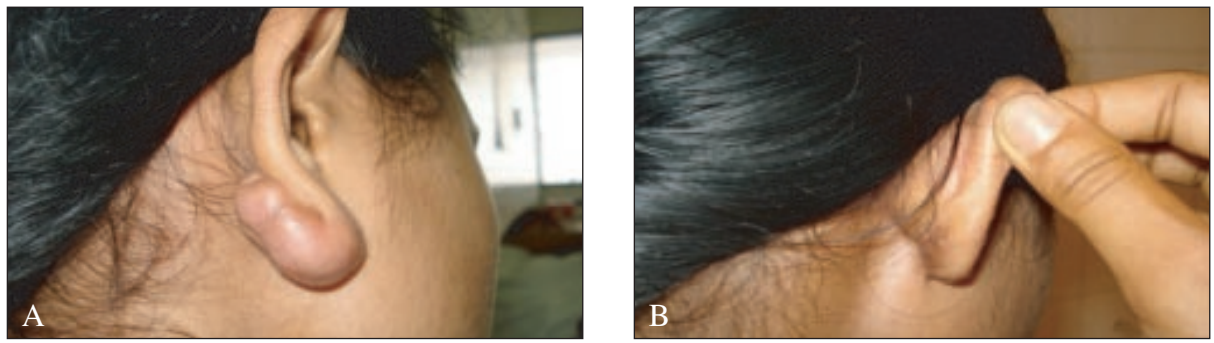
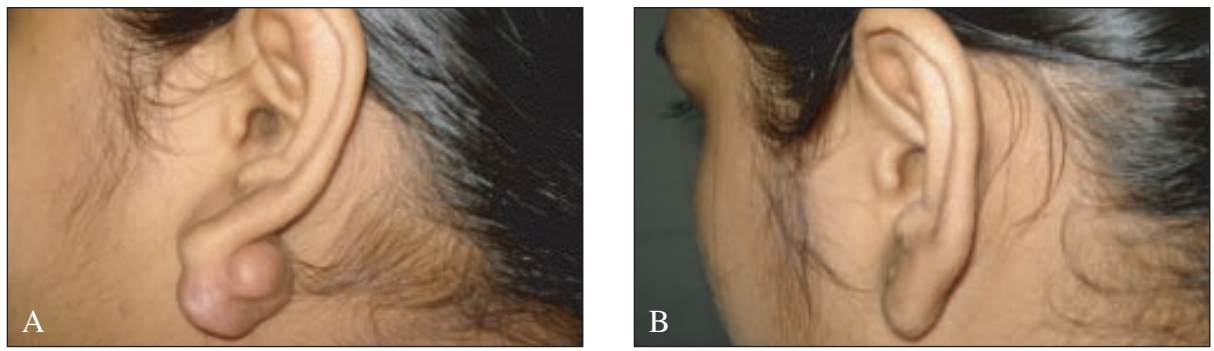


Fig-1(Group-I case): (A) Keloid on the posterior surface of the right earlobe. (B) In the post treatment two years, no residual in earlobe.



2(Group-II case): (A) Keloid on the posterior surface of the left earlobe. (B) In the post treatment two years, no residual in earlobe.

References

1. Lawrence WT. In search of the optional treatment of keloids: Report of a series and a review of literature. Ann Plast Surg, 1991; 27: 165-85.
2. Ketchum LD, Smith J, Robinson DW, Masters FW. The treatment of hypertrophic scars, keloids and scar contracture by triamcinolone acetonide. Plast Reconstr Surg, 1966; 38: 209-17.
3. Tang YW. Intra and postoperative steroid injections for keloids and hypertrophic scars. Br J Plast Surg, 1992; 45: 371-3.
4. Brown IA, Pierce HE. Keloids: Scar revision. J Dermatol Surg, 1987; 12: 51-6.
5. Ketchum LD, Robinson DW, Masters FW. Follow-up of treatment of hypertrophic scars and keloids with triamcinolone. Plast Reconstr Surg, 1971; 48: 2.
6. Alhady SMA, Sivanantharajah K. Keloids in various races: A review of 175 cases. Plas Reconstr Surg,1969; 44: 564-6.
7. Coaman B, Wolff M. Correlation of keloid recurrence with completeness of local excision: A negative report. Plast, Reconstr, Surg, 1972; 50: 163-6.
8. Rocwell WB, COken IK, Ehrlich HP. Keloids and hypertrophic scars: A comprehensive review.
Plast Reconstr Surg, 1989; 84: 827-7.
9. Coken IK, DiegelmannRF. The biology of keloids and hypertrophic scars and the influence of corticosteroids. Clin Plast Surg, 1977; 4: 297.
10. Henning JPH, Roskam Y, Van Gemeret MJG. Treatment of keloids and hypertrophic scars with an argon laser. Laser Surg Med, 1986; 6: 72.
11. Alan DM, and Ian AM. Fundamental Tecniques of Plastic Surgery and their surgical applications, 10th edition, London: Churcil Livingstone, 128.
12. Rosen DJ, Patel MK, Freeman K, and Weiss PR. A primary protocol for the management of ear keloids: results of excision combined with intraoperative and postoperative steroid injections, Plast Reconstr Surg, 2007; 120(5): 1395-400.
13. Barton RP. Auricular Keloids: a simple method of management, Ann R Coll Surg Engl, 1978; 60(4): 324-325.
14. Shons AR, Press BH, The treatment of earlobe keloids by surgical excision and postoperative triamcinolone injection, Ann Plast Surg, 1983; 10(6): 480-2.
15. Chowdri NA, Mattoo MMA, Darzi MA. Keloids and hypertrophic scars: results with intraoperative and serial postoperative corticosteroid injection therapy, Aust N Z J Surg, 1999; 69: 655-659.