Original Research Article

Treatment of earlobe keloids by extralesional excision combined with high dose Brachytherapy

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Abstract

Introduction: Radiotherapy as an accessary therapy to surgical resection has revealedvariable rates of recurrence giving earlobe keloids. The rationale behind study was determine outcomes of earlobe keloid surgical excision followed byhigh-dose-rate brachytherapy.**Methods:** Retrospective chart of 32 patients with 32 earlobe keloids treated withsurgical excision followed by high-dose-rate brachytherapy, betweenJanuary 2017 to May 2018 were enrolled. Demographic database, Fitzpatrick skin type, laterality, lesion size, and follow-upvisits information. Outcomes were measured in terms of keloid recurrencerates, complications and after 24 months of follow-up.**Results:** Twenty-five patients (78%) were femalesandthe remaining seven (22%) were males. This concludes that females were more prone for keloid which may be secondary to history of ear piercing. Four patients (12.41%) experienced keloid recurrence, three at 6 months (9.3%), and one at 12 months (3.1%).**Conclusion:** Surgical excision followed by high-dose-rate brachytherapy is secure andeffective to treat earlobe keloids and can be considered a first linecombined treatment.

Keywords: Keloid, ExtralesionalExcision, brachytherapy, dermatitis, radiotherapy.

Introduction

Keloid and hypertrophic scars are fibrous growths considered byexcessive collagen deposition located in a prior skin injury site.Keloids are multifaceted conditions in which different ethnic groupshave flexible susceptibilities to develop the disease. Prevalence between populations might imitate different genetic risk factors.[1] Pathological findings comprise over proliferation of fibroblasts, excessive deposition of collagen, elastin and proteoglycans in the extracellular matrix.[2] Cultured fibroblasts have shown that keloid fibroblasts(KFs) yield up to 12 times more collagen than normal skin fibroblastsin response to TGF-beta. Surgical excision alone is seldom curative with recurrence rates ranging between 45 and 100%,[3] frequently linked with stronger collagen buildup and a larger lesion formation to the discontentment of physicians and patients.[4] Radiotherapy inhibits inflammation, probably by impairing immune cellfunction and formation of neovasculature.[5] Currentevidence proposes that the risk of recurrence afterpathological scar excision can be reduced afterpostoperative radiotherapy.[6] The recurrence rate of ear keloids after surgery and radiation therapy has been estimated in 14.0% (Range: 2.8-33.3%).[7] The success ratio varies inworks because each study has a dissimilar radiation dose, fractionation regimen, field size, oraction depth. The rationale was todescribetreating earlobe keloidswith surgical excision followed by high-dose-rate brachy therapy (HDR-BT) and present outcomes in terms of recurrence, complications.

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Materials and Methods

A retrospective record-based study was conducted andfollow-up of 32 earlobe keloids found in 32 patients treated with surgical excision followed by HDR-BT,between January 2017 and May 2018. Information was obtained using institutional medical records section.Informed consent was not needed as record were used. Database included age, gender, Fitzpatrickskin type, laterality, lesion size and description,comorbidity, operative times, blood loss, and follow-up visits evidence. Outcomes wereevaluated in terms of keloid recurrence after finishing a full period of follow-up and patient subjective satisfaction level with aesthetic result. Complications were distinct as surgical wound dehiscence, bleeding, infection, and skin necrosis. Postoperative visits were doneduring the first 2 weeks, and follow-upvisits took place at 3, 6, 12, and 24 months. Data of patient between the age group between 18 to 60 years were included in the study. American Society of Anesthesiology (ASA)class I and III, clinical diagnosis of earlobe keloidof 10 mm or in its wider diameter. A keloidwas distinct as an area of proliferation of fibroustissue at the site of a scar or skin injury that producesbeyond the original margins of the scar and isperhaps associated with erythema, pruritus, pain or paresthesia.Preoperative pictures weretaken (Figures 1(a,b). Surgical excision containedof scalpel "in-bloc" lesion removal, below infiltrative local anesthesia with 2% lidocaine,followed by immediate earlobe rebuilding. Surgical technique was selected based on the gross appearance of the keloid.[8]Then, patients were taken to start HDR-BT. Procedure consisted ofa total dose of 12 Gy, fractionated in 3 doses of 4Gy given for 3 days, commencement within the first 24hours after surgical excision. Patients were examined postoperatively as clinically indicated for 2 weeks.Sutures were removed after 14 days. Follow-up datawas repossessed after revising notes from visits at 3,6, 12, and 24 months.Patients with keloid recurrence began a protocol of triamcinolone acetonide infiltration in the deep dermis of 0.1 to 0.2 mL at a 5 mg/mL concentration,every 21 days as clinically indicated.

The study was approved by Institutional Ethics Committee.

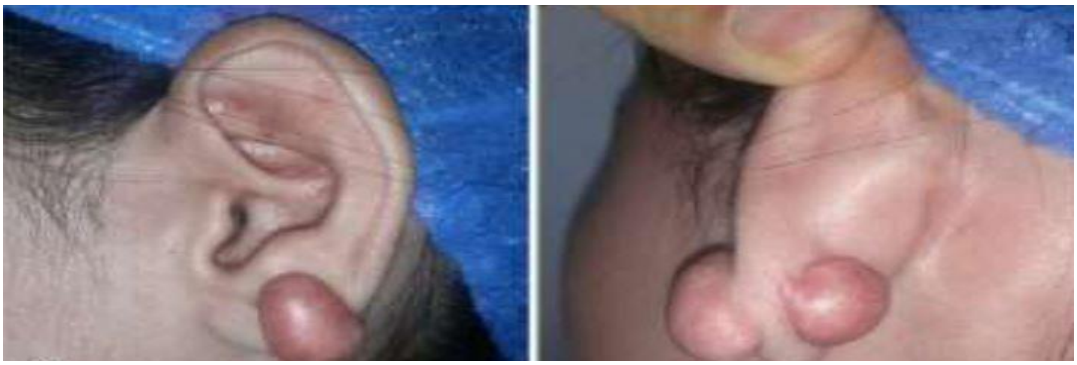

Fig 1 (a, b):Preoperative views

Fig 2 (a, b):Intraoperative and Post-operative view after 3 months

Statistical Analysis-

Statistical analysis was performed using IBM SPSSversion 20.0 software. Categorical variables are expressedusing frequency and percentage. Continuous variables are presented by mean and standard deviation. To test thestatistical significance of association Chi-square test was used. P-value <0.05 is considered statistically significant.

Results

Table 1:Demographic and Peri-operative details of study participants (N=32)

Variables	N (%)
Gender	
Males	7 (22)
Females	25 (78)
Mean age (years)	25 (range 18-60 years)
Avg size of keloid	17mm (range 12-37mm)
ASA I	28 (88)
II	4 (12)
Fitzpatrick skin type	Type IV (65%)
Complications	0 (0)

As per table 1 A total of 32 surgical excisions followed by HDRBT were performed in 32 patients who have been diagnosed with earlobe keloids. Mean age was 25 years old (range 18-60 years). Twenty-five patients (78%) were females and the remaining seven (22%) were males. This concludes that females were more prone for keloid which may be secondary to history of ear piercing. Twenty-eight patients (88%) were ASA class I and four patient(12%) ASA II. Average keloid size was 17 mm. All procedures were completed without complications.

Table 2:Location, Recurrence and Management of Keloid

Variables	N (%)	p-value
Location		
Left	24 (75)	**0.01***
Right	8 (25)	
Recurrence		
3 months	0 (0)	
6 months	3 (9.3)	
12 months	1 (3.1)	
24 months	0 (0)	0.11

Follow-up management		
Yes	4 (12.5)	0.78
No	28 (87.5)	

As per table 2 the most common location for keloid was found to be left ear seen in 75% of cases. Four patients (12.41%) experienced keloid recurrence, three at 6 months (9.3%), andone at 12 months (3.1%). All patients withrecurrence responded favourably to triamcinolone infiltration, with one patient experiencing signs of dermal thinning afterwards. No further surgicalexcisions were needed. Seven patients (21.43%)experienced mild signs of self-limited post-radiation dermatitis within the first 4 weeks, including erythema and desquamation.

Discussion-

The validation for using postoperative radiotherapy after pathological scar resection is to switch its recurrence.Familial aggregation, incidence in identicaltwins, Mendelian modes of inheritance, expression studies, and the high prevalence of keloids among dissimilar ancestries, all provided strong evidence infavour of genetic factors in keloid formation.In the present study, surgicalexcision followed by 12 Gy irradiation delivered inthree fractions over three days resulted in 12.41% ofrecurrence,21.43% of mild post-radiationdermatitis.Keloids experiencing recurrence wereeffectively treated with infiltration oftriamcinolone, avoiding further offensive procedures.Shin et al. in a systemic review and meta-analysisof 1105 patients treated for ear keloids after surgicalexcision, adjuvant radiation therapy was relatedwith an overall reappearance rate of 14% (95 percent CI, 9.6 to 19.9%; $p<0.001$). The most shared dosewas either 10 Gy or 15 Gy, administered for two orthree days after surgery[6].Stahl et al. reported a relapse rate of 26%with keloid resection and a perioperative“sandwich” radiotherapy protocol, that contained indelivering a total dose of 10 to 12.5 Gy in twofractions including a day before and a day after theoperation.[9] A report from Jones et al. of keloids treated withsurgical excision surveyed by in-office superficial radiation therapy (18 Gy/3fr/3days) displayed a 19%recurrence rate, with a 75% of their sample beenself-identified as African American. From an evolution viewpoint, keloids might havedeveloped as a defense mechanism among convincedindividuals living in tropical climates to wall offparasitic infections of the skin, ensuing in moreadverse scarring. Such gene polymorphisms couldclarify why other individuals’good healers in similar environmental surroundings are.[10,11,12]

Conclusion

Surgical excision followed by HDR-BT for earlobekeloids is viable, secure, and results are favourableand can be offered as a first line combinedtreatment. Though the sample size of the study was too small which was the main limitation of the study and lack of controlgroups. More research is granted to establishoptimal protocols and indications.

Conflict of Interest: Nil
Source of support:Nil

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