

Research Article

Outcome of Large Keloids with Precut Technique

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Abstract |

Background: Keloids are benign skin lesions that are often a cause of functional and cosmetic concern for the patient. The Objective of this study was to evaluate the aesthetic satisfaction and outcome of precut technique in patients with keloids requiring skin graft.

Methodology: This was an observational study done at the Department of Plastic Surgery, Shaikh Zayed Hospital, Lahore from June 2020 to May, 2021. An incision was made down to the subcutaneous layer around the edge of the keloid (precut), and radiotherapy (pre graft) was applied on the following day. Next day, the keloid was excised and wound closed with an intermediate thickness skin graft. Second fraction of radiotherapy was given in 2 weeks when the graft take was satisfactory. Patients were followed up, and at 12 weeks the scar was evaluated by doctor. Aesthetic satisfaction was determined by the patient using verbal rating scale VRS questionnaire. The data was evaluated using chi-square-test.

Results: Sixty seven (67) patients with keloids greater than 4cm² were treated by using the precut, pre graft radiotherapy technique. Sixty four patients (64) out of 67 patients (95%) had cure at the scar site with incision margins soft, pale and flat. Three patients (5%) had graft contraction with firm, pale and protuberant incision margins. Also, 64 (95%) patients were satisfied with the aesthetic results and rated the scar site as good outcome. Only 3 (5%) patients were dissatisfied with the results and rated scar site as poor outcome.

Conclusion: Keloid edge precut, pre-graft radiotherapy method is effective treatment method for patients with large keloids that require excision and skin graft.

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Introduction

Keloids are benign skin lesion that occur beyond the normal boundaries of a scar.¹ Keloids occur equally in both genders across all age groups.² Keloids are caused by trauma, irritation, insect bite, vaccination, skin piercing, acne, folliculitis and chicken pox. Injuries that reach the reticular dermis cause keloidal and hyper-trophic scar.³ Spontaneous keloids occur without history of any trauma and are associated with genetic conditions or with use of certain medications.⁴

Many treatment regimens have been advocated such as intralesional steroid,⁵ steroid with 5 fluorouracil therapy,⁶ surgical excision followed by radiotherapy,⁷ brachytherapy,⁸ silicon tape, laser excision, oral colchicine and pressure devices.⁹ In patients with large keloids, primary closure of the defect is difficult. Skin grafts are the only remaining option to cover the defect.¹⁰ Surgical excision without radiation leads to recurrence in 80-100% cases.¹¹ Radiation is effective in reducing the recurrence rate when applied within 24-48 hours.¹² Patients with skin grafts have radiation constraints due to surgical bandage and radiation has to be postponed

up to 14 days till the survival of the graft.

To address this issue wenbo er al¹³ devised the technique of keloid edge precut, early radiotherapy, followed by completion of excision and skim graft. This study is compared the effectiveness of this technique with the conventional method of keloid skin graft treatment. Results showed that the recurrence rate of keloids was 16.7% in the precut group as compared to 55.2% in conventional group, at 1 year followup.

The rationale of this study is to determine the effect of precut technique on our set of population. It is a combination of keloid edge precut with early radiotherapy within 24 hours ,followed by excision and grafting the next day. Second fraction of radiation was given once the graft take was satisfactory.

Methodology

This was a prospective study done at department of plastic surgery, Sheikh Zayed Hospital over a period of one year from June 2020 till May 2021. Patients were enrolled through the out patient department. Patients of both gender, aged 18-80years with keloids greater than 4cm², at any site of the body, unable to close primarily and requiring skin graft were included. Patients who had previous treatments in the form of massage, pressure garments, intralesional steroids and excisions were also included. Small keloids-requiring primary closure or patients with previous post radiation complicated keloids were excluded from our study.

Technique

Local anesthesia was administered at the keloid edge with 0.5% lidocaine (1:100,000 epinephrine). An incision was made along the keloid margin in the normal skin deep into subcutaneous tissue without excising the keloid (precut, fig a,b). After bipolar coagulation incision was closed with intradermal continuous suture. fig 1c. The surgical site was covered with opsite dressing. Radiotherapy of 9 Gray (pre-graft radiation) was given at the keloid edge incision site within 24 hour. The excision of the keloid with skin grafting and bolus pressure dressing was done the following day (fig d). First dressing was removed on 3rd post op day. The graft take was assessed on 14th postoperative day and second set of radiotherapy. 9 Gray was given if the graft take was satisfactory. Patients followed up at 2,4, and 12 weeks to assess the graft site. Patients were advised graft massage from 4 weeks onwards. Final scar evaluation

was done by Doctor at 12weeks, as cured or partially cured. A flat scar, with pale margins which stays within the limits of incision, with no graft contraction is considered to be cured scar.(fig1e). A scar with protuberant margins, red in color, which stays within the limits of incision is considered partially cured. Also, information about patient satisfaction was collected through VRS (verbal rating scale) questionnaire, at 12 weeks follow up visit. (Table 1)

All the data of my study was entered in SPSS version 20 and was analyzed. Descriptive statistics like age of the patients were presented as Mean±SD. Qualitative variables such as genders were calculated as frequency and percentages like gender. Data was stratified for age, gender, duration of keloid and site of keloid. Post stratification Chi-square test was used taking p value and <0.05 considered as significant.

Results

Sixty seven (67) patients met the criteria and were analysed. Male to female ratio was 1.09:1 with 52% males

Table 1: Verbal Rating Scale

| VRS RANGE 7-10 Good outcome | VRS RANGE 4-6 Average outcome | VRS RANGE 0-3 Poor out come |
|--|--|---|
| i.no itch at scar site. | I. Occasional itch | i. Marked itch. |
| ii.no pain at scar site. | ii. Occasional pain | ii. Marked pain |
| Iii.Patient highly satisfied with scar appearance. | iii.Patient satisfied with scar appearance | iii.Patient not satisfied with scar appearance. |

and 48% females. Seventy eight 78% had keloids sized 5-30cm² while rest of the patients had area greater than 30cm². More than 50% patients had history of flame burn injuries and skin infections in the past which progress to keloids, whereas others had history of acid burn, lacerations and surgical scars. Neck and presternal area were common location of keloid formation with 22% each, followed by 12% shoulder region and 10% arm, wrist, leg, thigh and epigastric region.

In our study, 64 (95%) patients had cure at the scar site and only 3 patients (5%) developed hypertrophic scar at the margins of the graft at 12 weeks follow up visit. According to patient VRS, 64 (95%) patients rated scar site as aesthetically good outcome. Only 5% (3) patients were dissatisfied with the aesthetic results and reported itching on the protuberant margins.

Two patients out of 3 had postoperative infections at the presternal area and their second fraction of radiotherapy was not given due to partial graft loss. One patient developed raised graft margins at wrist and did not comply with post operative massage therapy.



Figure 1a: 25cm² keloid on shoulder preoperative picture



Figure b: precut incision made



Figure c: Hemostasis secured with prolene 3/0 and patient sent for radiation within 24 hours time



Figure d: Excision + intermediate thickness graft application, the following day after radiation



Figure e: Results at 12 weeks follow up

Discussion

Corticosteroid injection for the management of keloid is a first-line option and it is useful for small lesions and easy to perform.¹⁴ The combination of 5FU and triamcinolone seems to be superior to intralesional steroid therapy alone (15 vs 40%) as reported by Davison et al.¹⁵

Intralesional triamcinolone injections are usually used after surgery in combination with surgical excision and decrease the recurrence rate of keloids by about 50%.¹⁶

In the meta-analysis published in 2016 triamcinolone injection and radiation were both considered reasonably good treatments for keloids without significant difference¹⁷.

Surgical excision followed by radiotherapy is helpful treatment for large and difficult-to-treat keloids especially those that failed to respond to more conservative measures. The balance between apoptosis and proliferation is impaired in keloid fibroblast and they are sensitive to X-ray radiation which prevent keloid recurrence by controlling fibroblast proliferation arresting the cell cycle and inducing premature cellular senescence.¹⁸

Moreover, a consensus statement from European society for therapeutic radiology and oncology noted that keloids are acceptable indication for radiotherapy and place no age restrictions provided that alternative therapies were ineffective.¹⁹

The variety of treatments for keloid suggest that none are satisfactory. Surgery alone leads to recurrence rates of 45 to 100%.²⁰ Combining radiation and surgical excision is considered as the last resort which can significantly reduce recurrence rate.²⁰ Another study done by Cheraghi et al⁷ showed that there is a decrease in

relapse rate of keloid formation if radiation is given within 24 hours after surgery.

In our study we preferred radiotherapy to large keloids which are refractory to other treatments, to see the outcome of radiation on skin grafted keloids. Also, radiation was given within 24 hours of keloid edge incision to address the issue of delayed radiotherapy.

It was an old belief that extralesional incisions stimulate additional collagen synthesis, prompting quick recurrence into a possible larger keloid than the initial one. For this reason, core excision of keloid tissue was recommended to prevent stimulation of additional collagen synthesis.²¹ Tan et al²² had shown, however, that leaving a small margin of keloid skin in place will rather stimulate a recurrence similar to residues in tumor excision stimulating tumor growth. This concept was incorporated in our study where extra marginal incision (precut) was made to prevent growth of residual stimulating factor and to see the outcome on our set of patients.

In our study the results are quite encouraging at 12 weeks follow up with 95% cure rate at the scar site and recipient area rated as aesthetically good. This is comparable with the results of a study done by Wenbo¹³, where 91% of the patients had cure at scar site and graded the aesthetic satisfaction as acceptable and good at 12 months followup. However, the limitation of our study is long term follow up to comment on the recurrence of the keloid growth.

Author declares no conflict of interest.

Conclusion

Early stage radiotherapy is an important adjunctive for the prevention of keloid recurrence. In patients with large keloids who require excision and skin grafting, radiation is often delayed for weeks till the graft take is satisfactory. Technique, Precut followed by pre-graft radiotherapy allows early radiation to the incised keloid margins, making this the ideal treatment choice in this subset of patients and leading to better scar outcomes.

Conflict of Interest

None

Funding Source

None

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