Magnet-retained Prophylactic Appliance for Post-excisional Pressure Therapy and Custom-made Acrylic Therapeutic Pressure Appliance for Auricular Keloid: A Clinical Report

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ABSTRACT

Keloid is cutaneous lesion characterized by fibrous growth produced as a result of aberration in the healing process. Pressure therapy, in combination with other forms of therapy, is used for the management of keloids. Clips or stents are generally used for the therapy and prophylaxis. This report presents use of presurgical compression and prophylactic passive pressure therapy with acrylic appliances for auricular keloids in a patient. Spring and magnets were used in the design of custom-made appliances for compression and retention.

Key words: Helix, keloid, pressure appliance, pressure therapy

INTRODUCTION

Keloid is a cutaneous fibrous scar that represents disequilibrium in the dermal wound healing process. Pressure therapy is used in the management of keloids, generally in combination with other therapies. This clinical report presents use of pressure through customized appliances for therapy and prophylaxis of the ear keloids in a young female patient.

CASE REPORT

A 26-year-old female patient was referred from the Department of Plastic Surgery for the fabrication of ear clip for ear keloid. She complained of swelling on the helix of right ear since 1½ years. There was history of first ear piercing of lobe of the ears at the age of 10 years without any swelling following piercing. Additional ear piercing was done at the age of 24 years at the helix of both ears. A small swelling appeared on the superior aspect of helix of ears bilaterally after 3-4 months of piercing, which gradually increased in size and continued to grow until it reached the present size on the right ear in 1½ year duration. Swelling appeared first on the left ear and was larger in size. That was excised surgically after 1½ years. Surgical excision of keloid on the left ear was done 1 week back.

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On examination, a small, oval, sessile, non-tender, smooth-surfaced swelling was present on the upper part of helix of the right ear, measuring 8 mm superoinferiorly and 6 mm anteroposteriorly. On the left ear, there was a healed scar on the superior aspect of the helix. There was no pain, pruritus, or other adverse accompanying symptoms except that it caused emotional stress due to impaired esthetics. A clinical diagnosis of keloid was given. It was planned to use pressure therapy to reduce the size of the growth on right ear and to prevent recurrence on the left ear. Custom-made methyl methacrylate pressure appliances were planned to be used for presurgical compression of the keloid on the right ear and passive methyl methacrylate pressure appliance for preventing recurrence on the left ear.

Procedure followed for fabrication of active pressure appliance

Patient's skin over the right ear and keloid was lubricated with petroleum jelly and external auditory meatus was blocked. Impression compound (DPI Pinnacle; DPI, India) was used to make beading around the auricle for the confinement of the impression material [Figure 1]. Then thin mix of irreversible hydrocolloid impression material (Zelgan 2002; Dentsply, India) was poured within the confinement of the beading with patient's head tilted

opposite to the side for which impression was being made. Bell pins were placed in the partially set hydrocolloid for the retention of backing material. Thin mix of plaster of Paris (Kaldent; Kalabhai Karson Pvt Ltd, Mumbai, India) was poured over the irreversible hydrocolloid as the backing material. Completed impression was retrieved after the impression materials were set. The impression was poured in dental stone (Kalstone; Kalabhai Karson Pvt Ltd) with adequate land area to make the cast [Figure 2]. A spring was designed using 21" gauze stainless steel wire that was made as a V-shaped loop with a helix at its apex and adapted over the growth on the cast. A custom-made pressure appliance was fabricated incorporating this loop in clear methyl methacrylate and characterization was done to make the appliance more esthetically acceptable and unnoticeable to others [Figure 3]. Care was taken to ensure adequate space for acrylic resin between the wire loop and the skin to avoid direct contact of the stainless steel wire with the skin. The design of the appliance involved covering the whole of the surface of the growth with gap between the two almost equal halves to permit activation in order to ensure sustained pressure, thus allowing adjustments to accommodate the reduced size and negating the need for fabrication of a new appliance.

Procedure followed for fabrication of passive pressure appliance

The master cast for the left ear was obtained following the same procedure as that for lubrication, blocking, and impression of the right ear [Figure 4]. A custom-made passive pressure appliance was planned with incorporation of magnets for retention. It was fabricated by adapting methyl methacrylate without any spacer, around the scar over the helix. Two pairs of 2 × 2 mm magnets (TT magnets, Mumbai, India) were incorporated in the acrylic resin with two similar poles of magnets in each half [Figures 5 and 6]. As there was no gap planned between the two halves of the appliance, it did not put any active pressure on the scar that could cause soreness. However, it would prevent any growth above the surface by confinement of the soft tissue to the internal dimensions of the appliance. Color matching of the appliance was done to make it less evident.

The appliances were finished, polished, and adjusted to remove any sore spots. These were delivered and patient was instructed to wear them all the time. She was also instructed about their use, maintenance of hygiene, and regular follow-up. Patient was counseled about any probable post-surgical nodule and close monitoring for recurrence. The periodic activation of the active pressure appliance was done by closing the coil of the spring. Patient was monitored for use of the appliances regularly. During follow-up, a 1 mm reduction in overall size of the right keloid was achieved after 3 months and the growth appeared shrunken in appearance [Figure 7]. No recurrence was observed in the left keloid scar [Figure 8]. No other complication was observed during treatment.

DISCUSSION

Keloid represents an exuberant reparative process clinically appearing as elevated nodular growth that generally does not regress spontaneously. Auricular keloid is a recognized complication of ear piercing and it has cosmetic implications.[1] Keloid typically recurs after excision with a high recurrence rate. The secondary tumor is usually larger than the primary lesion.[2] Radiofrequency tissue volume reduction is a minimally invasive treatment option for ear keloids. Radiation therapy has been accepted as a keloid treatment modality. Postoperative radiation therapy is a safe and effective therapy in reducing the recurrence of keloids after excision surgery. Better patient compliance has been observed with radiation therapy as compared to postoperative corticosteroid injections. Intralesional steroids have been used alone or as a part of combination therapy. They are effective for prevention and treatment of keloids, especially the newer keloids, but atrophy, telangiectasias, and hypopigmentation have been the common adverse effects.

Pressure therapy is used in the management of keloid scars, generally in combination with other forms of therapy.[3] This form of therapy was popularized after the beneficial effects of pressure stockings were observed in healing of burn scars. It is used to manage and prevent the hypertrophic scarring. Pressure appliances such as various springs are used for maintaining pressure after surgical removal and to prevent post-surgical recurrence.[4] Pressure clip is used as in conservative treatment and is an essential adjuvant for early maturation of the scar tissue and prevents the recurrence of keloid.[5] In order to control the pressure and avoid soreness, it is mandatory to fabricate custom-made clip or stent. The appliances described involve simplified design and use of small magnets that makes them highly retentive and stable and do not cause any pressure simultaneously. The materials used for fabrication include acrylic resin, stainless steel wire, and commonly available magnets, making it a low-cost alternative.

CONCLUSION

This article describes a clinical report of a young female patient with ear keloid for which simple and logical

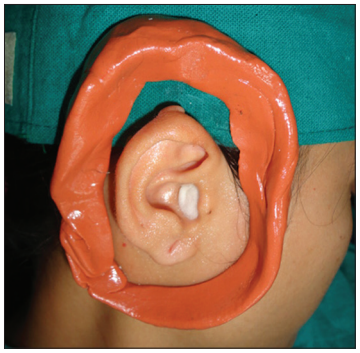

Figure 1: Impression compound beading around the right auricle with blocked meatus

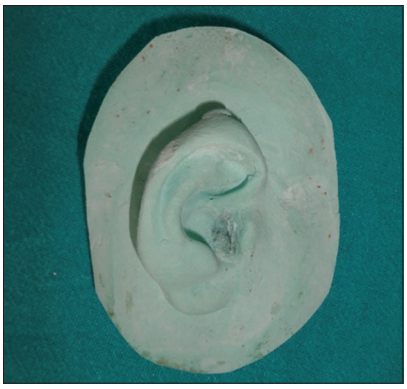

Figure 2: Master cast of right auricle showing keloid on helix

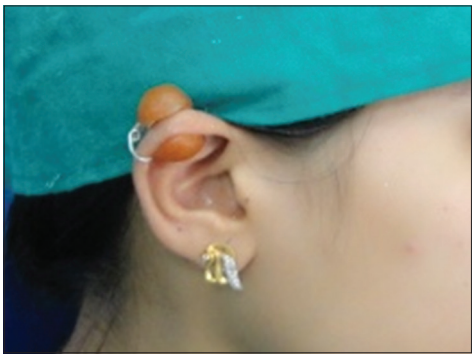

Figure 3: Custom-made pressure appliance with spring on the right ear helix

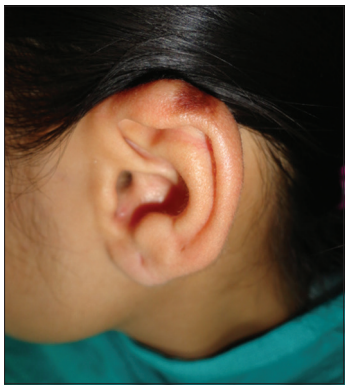

Figure 4: Post-excisional scar on the left ear helix

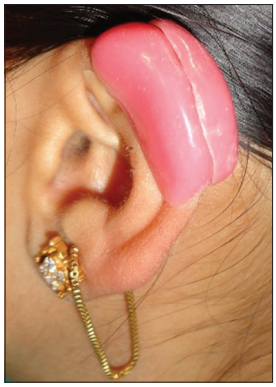

Figure 5: Prophylactic appliance on the scar on the left ear helix

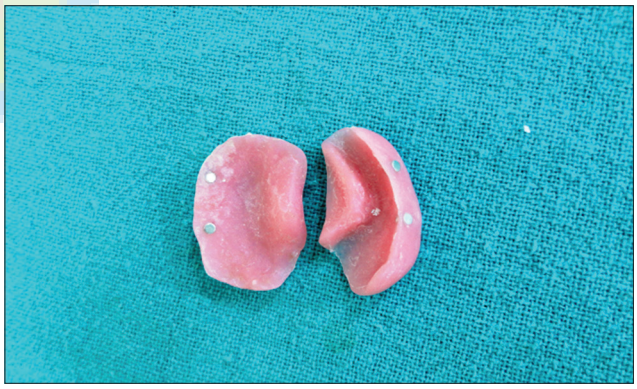

Figure 6: Two-part prophylactic appliance incorporating magnets

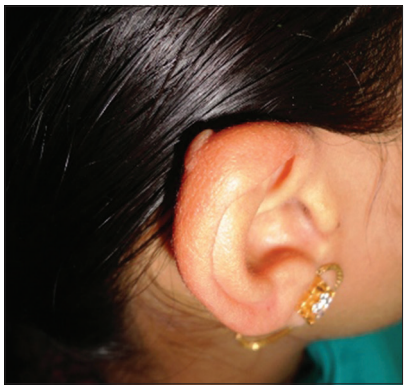

Figure 7: Reduced and shrunken keloid on the right ear helix

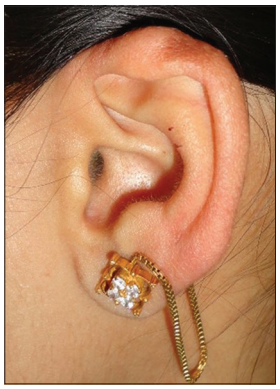

Figure 8: Healed scar on the left ear helix

therapeutic and prophylactic appliances were fabricated. The described pressure appliance is active for the sustained compression of the keloid and passive for the prophylaxis of recurrence in surgically removed ear keloid.

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