Management of Keloid by Hirudotherapy: A Latest Non Surgical Approach

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Citation

Abstract
According to Greek classical books leech therapy is the best way to overcome chronic inflammatory conditions. It has been proved that intervention causes reduction in oedema, pain and conjunction. Keloids were described by Egyptian surgeons around 1700 BC. Alibert called the Keloid first cancroids and later cheloide. Keloid usually grows beyond the borders of the original wound in claw-like growths and can develop after acne, body piercings, burns, laceration, surgical wounds etc. The aim of present study was to assess the effect of leech therapy in resolving the Keloid without surgical intervention and to avoid the scar formation and recurrence. The present study has been conducted at Regional Research Institute of Unani Medicine, Srinagar, to evaluate the Keloid resolving activity by the bioactive substances present in the leech saliva. The study has proved very effective by giving the Hirudotherapy to a young female patient with post traumatic Keloid above the knee joint, The Keloid was completely resolved and leaving the skin surface very smooth without scar formation. there was no recurrence of Keloid even after one year of post leech therapy follow ups.

1. Introduction
Keloids were described by Egyptian surgeons around 1700 BC. The great Greek physicians Majoosi and sheikh discussed about the leech therapy in their era of practice. Louis Alibert identified the Keloid as an entity in 1806. Change in the cellular signal that control growth and proliferation leads to Keloid formation. It expands claw-like growth over normal skin. They are more commonly seen in central chest, back, shoulders, earlobules, arm, pelvic region and collar bone. Keloids are elevated fibrous scars that extend beyond the borders of the original wound, do not regress, and usually recur after excision. The term is coined from the Greek word cheloides, meaning “crab’s claw.” Hypertrophic scars are similar, but are confined to the wound borders and usually regress over time. Scar hypertrophy usually appears within a month of injury, whereas keloids
may take three months or even years to develop. Both represent abnormal responses to dermal injury, with exuberant deposition of collagen developing over three basic stages: (1) inflammation (first three to 10 days); (2) proliferation (next 10 to 14 days); and (3) maturation or remodeling (two weeks to years).¹

2. Risk Factors and Etiology

The primary risk factor for keloids is darkly pigmented skin, which carries a 15- to 20-fold increased risk, perhaps because of melanocyte-stimulating hormone anomalies.⁴ Familial predisposition, with autosomal dominant and recessive genetic variants is recognized.⁵ Black, Hispanic, and Asian persons are far more likely to develop keloids than white persons.⁶,⁷

Keloids are more common in persons younger than 30 years, with risk peaking between 10 to 20 years of age, and in patients with elevated hormone levels (e.g., during puberty or pregnancy).⁸ Sternal skin, shoulders and upper arms, earlobes, and cheeks are most susceptible to developing keloids.⁹ Certain types of trauma and delayed healing (longer than three weeks) heighten Keloid incidence however burns carrying the highest rate.

2.1. Epidemiology

Keloid affects both sexes equally. The incidence in young females is more than young males and is more common in dark skinned people especially African races and shows genetic trait transmitted by mother or father with the children having 50% possibility of developing a Keloid scar.¹⁰ In certain syndromes like Rubinstein-taybi and Goeninne, it has been found that there is increased incidence of Keloid formation. Keloid may develop from pseudofolliculitis barbae, razor bumps and is also speculated to be hereditary.¹¹ It is estimated that up to 4.5% of general population suffer from hypertrophic scarring. The incidence is 15% higher in high pigmented people. People of any age can develop keloids and children under ten are less likely to develop Keloid. Incidence and prevalence of Keloid in United States is not known. Indeed, there has never been a population study to assess the epidemiology of this disorder. In his 2001 publication, Marneros quoted from Bloom’s 1956 publication on heredity of keloids and hypertrophic scars are perhaps the first-oftaken two or more genetic mutations, whereby the disease appears in its most severe form. An analogy can be made to thalassemia, whereby various phenotypes, thalassemia traits, minor, intermedia and major; are linked to various genetic abnormalities involving two sets of alleles for alpha and beta globin genes and numerous genetic abnormalities of the two distinct genes.

2.4. Morphological Classification

Keloid lesions take on a variety of shapes and forms, and appear in any part of the skin. Keloid lesions can be classified according to their appearance as “Keloidal Papules”, “Nodular Keloid”, “Keloid Tumors”, “Linear Keloid”, “Flat Keloid, Keloidal Plaque”, “Butterfly Keloid”, “Guttate Keloid”, “Hyper-inflammatory Keloids”, “Superficially Spreading Keloids”, “Pedunculated Keloid”, “Bulky Keloids”, and ”Massive Keloids”

2.5. Topographical Classification

Keloid lesions can form in unique and well defined parts of the skin; and in each part, the Keloid lesions can display a unique shape and form. “Scalp Keloids”, “Ear Keloids”, “Earlobe Keloids”, “Posterior Auricular Keloids”, “Facial Keloids”, “Neck Keloids”, “Chest Wall Keloids”, “Upper Arm Keloids”, “Umbilical Keloids”, “Pubic Keloids”

3. Treatment and Prevention Options for Keloid

3.1. Corticosteroid Injections

- Corticosteroid injections for prevention and treatment of keloids and hypertrophic scars are perhaps the first-
line option for family physicians. Corticosteroids suppress inflammation and mitosis while increasing vasoconstriction in the scar. Triamcinolone acetonide suspension (Kenalog) 10 to 40 mg per mL (depending on the site) is injected intralesionally, which, although painful, will eventually flatten 50 to 100 percent of keloids, with a 9 to 50 percent recurrence rate.\textsuperscript{9} Lidocaine (Xylocaine) may be combined with the corticosteroid to lessen pain, whereas using adjunctive cryotherapy immediately before injection may make the procedure easier by softening the scar (based on expert opinion).\textsuperscript{10} Combining cryotherapy and corticosteroid injections also improves outcomes more than either modality alone, although hypopigmentation is always a significant concern.

- **Surgery:** This is risky, because cutting a keloid can trigger the formation of a similar or even larger keloid. Some surgeons achieve success by injecting steroids or applying pressure dressings to the wound site for months after cutting away the keloid. Radiation after surgical excision has also been used.

- **Laser:** The pulsed-dye laser can be effective at flattening keloids and making them look less red. Treatment is safe and not very painful, but several treatment sessions may be needed. Treatment of keloids with short-pulsed, 585-nm pulsed dye laser has shown limited promise, with a 57 to 83 percent improvement rate.

- **Silicone sheets:** This involves wearing a sheet of silicone gel on the affected area continuously for months, which is hard to sustain. Silicone elastomer sheeting is a noninvasive and extensively studied approach to the prevention and treatment of keloids and hypertrophic scars. Silicone sheets are thought to work by increasing the temperature, hydration, and perhaps the oxygen tension of the occluded scar, causing it to soften and flatten.

- **Cryotherapy:** Freezing keloids with liquid nitrogen may flatten them but often darkens or lightens the site of treatment.

- **Interferon:** Interferons are proteins produced by the bodies immune systems that help fight off viruses, bacteria, and other challenges. In recent studies, injections of interferon have shown promise in reducing the size of keloids, though it's not yet certain whether that effect will be lasting.

- **Fluorouracil:** Injections of this chemotherapy agent, alone or together with steroids, have been used as well for treatment of keloids.

- **Radiation:** Some doctors have reported safe and effective use of radiation to treat keloids.

### 3.2. Combination Therapy Following Surgery

The use of corticosteroid injections following keloid surgery reduces the recurrence rate to less than 50 percent. A “triple keloid therapy” combining surgery, corticosteroids, and silicone sheeting has been shown to be even more effective, with only a 12.5 percent recurrence rate after 13 months.

#### 3.3. Imiquimod

Imiquimod 5% cream (Aldara), an immune response modifier that enhances healing, has also been used to help prevent keloid recurrence after surgical excision.

#### 3.4. Other Therapies

- Intrallesional verapamil (2.5 mg per mL) in conjunction with silicone sheeting reduced keloid postsurgical recurrence by 90 percent.
- Calcium antagonists appear to work by reducing collagen production and may be a reasonable and safe alternative to corticosteroid injection in the future.
- Intrallesional fluorouracil (50 mg per mL, two to three times per week) appears to shrink keloids safely.
- Combining fluorouracil with corticosteroid injections and pulsed dye laser produced superior results more rapidly than corticosteroid injections alone or corticosteroids with fluorouracil.
- Bleomycin is another useful chemotherapeutic agent used for the treatment of Keloids.
- Intrallesional interferon alfa-2b reduced keloid size by 50 percent over nine days, proving superior to intrallesional corticosteroids.

### 4. Material and Methods

A 30 year old female patient came with keloid on her right leg above the knee joint anteriorly. She had opted for different treatment modalities except surgery but no improvement was observed. Finally Leeching was done in our research institute after undergoing certain investigations including heamogram, ESR, blood sugar, KFT and LFT to rule out any pathology. After screening, leeching was done on day one. leeches were applied to the site under all aseptic conditions. Leeches were allowed to suck on the Keloid lesion till they get belly filled and fall of their own. After detaching of leeches antiseptic bandaging was done. four sitings of leeching was done after every twenty days. post treatment follow up was done every after one month for a period of one year. Complete disappearance of Keloid lesion was found after one month of last sitting of leach therapy.

### 5. Discussion

Keloids are fibrotic tumors characterized by atypical fibroblasts with excessive deposition of extracellular matrix components. It can cause significant pain, pururitis and most importantly physical disfigurement. Different treatments are available for Keloid like surgery, radiotherapy, cryotherapy, steroids, lasertherapy, interferon therapy, pulsed dye lamp treatment, use of selecon gel, retenoids, cytotoxic medicine etc (18-21). The above said modalities of treatment has side effects like telangiectasia (steroids), thinning of surrounding
skin (steroids), cancer (radio therapy), paleness of skin (cryotherapy), pain in the scar (cytotoxic medicine). Keeping in view, the side effects and the chance of recurrence and ulceration it has been decided to use Hirudotherapy as an alternative treatment for the treatment of the Keloid. It has been observed that three and half centimeter long and one centimeter thick Keloid was completely resolved and there was also no scar formation.

Pictorial View of Leech Therapy in Keloid and Its Complete Cure by Leaving the Skin Surface Smooth without Scar Formation.

Fig. 1. Patient with Keloid at the time of clinical examination.

Fig. 2. Depicts the first sting of leech application.

Fig. 3. Keloid starting Regressing.

Fig. 4. Second sting of leeching on Keloid lesion.

Fig. 5. Shows the further regression of the Keloid.

Figure 1 depicts the patient with Keloid at the time of clinical examination and registration. Figure 2 depicts the first sting of leech application. After the first follow up, that is after twenty days the Keloid region starts regressing, which is shown in figure 3 and on the same day second sting of leeching was done which is shown in the figure 4. Figure 5 shows the further regression of the Keloid lesion at second follow up. After completing third and fourth sting of leeching the Keloid was fully vanished and after one week the scar mark also completely disappeared which is shown in figure 6 and figure 7. After completing the treatment (leech Therapy) the patient was followed up monthly for a period of one year and it was observed that there was no recurrence of Keloid lesion.
Fig. 6. Complete regression/Disappearance of Keloid. However shows minor scar formation.

Fig. 7. Shows smooth skin surface without scar.

References


