Prevention of venous leg ulcer recurrence

Manjunath Shenoy M

PREVENTION OF ULCER RECURRENCE

Leg ulcers associated with chronic venous insufficiency (CVI) are known to recur after healing. Recurrence can occur in patients treated conservatively or with surgery. Such recurrences in severe CVI may be as high as 37%, and it seems to be higher in patients treated without surgery and in those with deep venous insufficiency.[1] Conservative hemodynamic correction may also be very effective in preventing recurrences and has lesser adverse effects than the surgery like venous stripping.[2] Both treatment and prevention of recurrence of venous ulcers aims to reduce the pressure in the venous system of the lower limb. This can be accomplished by mainly applying the compression stockings or hosiery on legs, surgical ablation of superficial and/or perforating veins or blocking any incompetent veins by injecting solutions (sclerotherapy). Several general measures such as exercise, limb elevation, and lifestyle modifications are likely to benefit. When compared to the therapy of leg ulcers, lesser number of meta-analysis and randomized controlled trials (RCTs) are directed toward the prevention of leg ulcers.

GENERAL MEASURES

Progressive resistance exercise to improve calf muscle function

Majority of patients with venous ulcer disease have an impaired calf muscle pump. Poor calf muscle pump function in patients with chronic venous ulceration can be improved by physical exercise.[3] There are evidences to support that enhancement of its ejecting ability with physical training results in improved hemodynamic parameters and promote ulcer healing. There are no RCTs or other forms of evidences that compared the recurrence rate of venous ulcers with and without progressive resistance exercise to prevent recurrence. One RCT compares 12 weeks progressive resistance exercise program in addition to compression with only compression. It was evident that significantly greater improvements in ejection fraction of the calf muscle in the exercise group.[4] Isotonic exercises may also improve calf muscle’s ejecting ability and the global hemodynamic status in limbs with venous ulceration.[5] Hence, it can be considered that limb exercise by its virtue of improving hemodynamic parameters of the affected limb is capable of preventing recurrences of venous leg ulcer.

Recommendation

Progressive resistance exercise can be considered in patients as a measure to prevent recurrences (evidence Level D).

Elevation of the lower limb

Elevation of the limbs when sitting and avoidance of standing for prolonged periods may assists in reducing edema. Apart from reducing edema, it may also enhance venous return. This is a simple and practical measure and may not induce any untoward effects. However, it may not be comfortable option for people with joint problems, especially in the older population.

There are no RCTs that compare recurrence of ulcers with and without limb elevation. A prospective longitudinal study indicated that at least an hour of leg elevation was associated with lesser number of recurrences.[6] In this study, role of compression hosiery, high levels of self-efficacy and strong social support was also associated factors that reduced ulcer recurrence.

Recommendation

Elevation of lower limb may reduce recurrence of venous ulcer (evidence Level D).

Other general measures

Apart from regular moisturizing of the legs measures such as diet modifications, nutritional supplements, cessation of smoking, weight reduction, maintaining a healthy cardiac status,
and strong psychosocial supports are likely to benefit individuals with history of venous leg ulcers. They are supportive and preventive in the management of the venous leg ulcers. There are no direct evidences to support that these measures are likely to reduce ulcer recurrence, but such measures are likely to reduce the venous load of the legs and improve general health of the patients. A large body mass index (>33 kg/m²) and short walking distance during the day (<200 m) were associated slow healing, which indirectly indicating the importance of weight reduction and regular walking is beneficial.

General measures such as diet modifications, nutritional supplements, cessation of smoking, weight reduction, maintaining a healthy cardiac status, and strong psychosocial supports can be practiced to prevent leg ulcers (evidence Level D).

**COMPRESSION THERAPY**

Below-knee graduated compression stockings or hosiery is likely to prevent recurrence of venous leg ulcer in patients after ulcer healing has been accomplished. In order to prevent ulcer recurrence, it is imperative that patients should be using them for long whether they are treated surgically or conservatively. It has been hypothesized that the application of external pressure by the means of compression to the calf muscle raises the interstitial pressure resulting in improved venous return and reduction in the venous hypertension, which in turn benefits prevention of venous ulcers.

Although, there are no RCTs compared recurrence rate of ulcers with or without compressions, not using compression has definitely shown a high degree of recurrences.

Patients should be offered the maximum pressure compression that they can tolerate to prevent ulcer recurrence because lowest recurrence rates were seen in people who wore the highest degree of compression. However, a high compression (Class 3) and moderate compression (Class 2) may not have significantly different recurrence rates. As one can expect, moderate compression will have better compliance and in a comparative study failure in compliance was 42% in Class 3 and 28% in Class 2 stockings. However, it is important not to underestimate value of higher compression since there is no large number of studies that compares various grades of compression. Multi-layered inelastic compression was less effective than elastic compression. Usage of specially-sized elastic hose (based on ankle and calf circumference) has shown improved compliance and clinical symptoms in those who cannot use routine-production sizes. Relationship between bandager skill and application technique are not explored sufficiently and could be the research area for future.

**Recommendation**

Continued use of compression therapy reduces the risk of venous ulcer recurrence (evidence Level B).

**VENOUS SURGERY**

Compression therapy using stockings or hosieries and the surgical correction of superficial venous incompetence are currently the main methods employed for the treatment for venous ulceration. They could be the best means of preventing the recurrence of ulcers too. Regular use of compression stockings even after complete healing of leg ulcers is the most important component of conservative measure. Sub-facial endoscopic venous surgery was most commonly performed surgery for ulcer healing and prevention of recurrence. Saphenous vein stripping was generally reserved for recurrent or nonhealing ulcers. Surgical methods also include per-cutaneous ligation of varicose veins and valvoplasty. There are many RCTs comparing the rate of healing and recurrence of venous ulcers with conservative measures and with surgery. There are studies that compare compression alone with compression and surgery in healing and recurrence of venous ulcers. Many reports conclude that superficial venous surgery is associated with similar rates of ulcer healing to compression alone, but with less recurrence.

There are meta-analysis and RCTs highlighting the role of surgery in the prevention of ulcer recurrence. Most of studies have compared the recurrence rates after only compression therapy and compression therapy with surgery. A study on 28 patients, examines the effect of closing incompetent superficial and/or perforating veins on ulcer recurrence rates in patients with CEAP 5 who have progressive lipodermatosclerosis and impending ulceration. Patients with CEAP 5 healed venous ulcers that underwent endovenous ablation had reduced ulcer recurrence compared with historical controls that were treated with compression alone. Another study involved 80 patients with 87 venous leg ulcers; after a mean follow-up of 3 years, recurrence rate was 9% in the surgical and 38% in the compression group clearly indicates surgery reduces ulcer recurrence. Another prospective, randomized and multicenter trial, which included 200 ulcerated legs (170 patients). During the follow-up of a mean of 29 months in the surgical group and 26 months in the conservative group, surgical group had an ulcer-free rate was 72%, whereas in the conservative group this rate was 53%. In another large study that involved 500 patients, recurrence at 4 years were 56% for the compression group and 31% for the compression plus surgery group.

These results indicate that surgical correction of superficial venous reflux in addition to compression bandaging on long-term follow-up contributes significantly to bringing down
rates of ulcer recurrence. This was irrespective of whether surgery benefited ulcer healing or not. Eradication of superficial reflux with additional subcutaneous fasciotomy for chronic and recurrent venous ulcer improves ulcer healing and even success rates of skin grafting. [20] Endovenous ablation alone has also reported reduced ulcer recurrence. [21] Among the various causes of recurrence, incompetent perforators in calf, primary or secondary deep vein insufficiency and incorrectly treated saphenous veins are most encountered causes. [22] Management of residual vein abnormalities by re-operation may achieve satisfying outcome.

Venous surgery reduces the chances of recurrence of ulcer (evidence Level B).

**SCLEROTHERAPY**

Foam sclerotherapy treatment is an alternative treatment for venous ulcer surgery. Studies have shown it to be effective in abolition of superficial venous reflux and may contribute to similar ulcer healing and long term recurrence rates to superficial venous surgery. Compared with liquid sclerosants, obliterating foam seems to be more efficient, especially for the closure of larger veins. Ultrasound guided foam sclerotherapy (UGFS) also seems to be a safe, clinically effective and minimally invasive alternative to surgery in patients with venous ulcers. UGFS also has proven to have comparable results to surgery in healing and recurrence may be lower. In a prospective study of 27 consecutive patients (28 legs) where UGFS was used as an adjunct to compression, 96% of venous ulcers healed within 3 months and only two healed ulcers (7%) had recurred at 12 months. [23] Compression sclerotherapy is also an effective measure for the venous ulcers; in a study on 126 patients was also an effective measure of ulcer treatment and rate of recurrence is as low as 18% in 5 years. [24]

**Recommendation**

Sclerotherapy reduces the risk of venous ulcer recurrence (evidence Level C).

**PHLEBOTONICS**

They represent a heterogeneous group of pharmacological agents used in venous disorders. These are known as vasoactive drugs, and their mechanism of action is not well-established. Most of these drugs are natural flavonoids extracted from plants. [25] Synthetic products with flavonoid-like properties are also used. There are not enough evidences that they have any role in the prevention of venous ulcers. [26]

**Recommendation**

Phlebotonics may be effective in the prevention of venous ulcers (evidence Level D).

**CRITERIA FOR SPECIALIST REFERRAL**

Ulcers not reduced in size by 25% in 4 weeks or failing to heal in 12 weeks should be considered for specialist referral. Patients who have the following features should also be referred to the appropriate specialist at an early stage of management:

- Uncontrolled pain
- Atypical distribution of ulcers
- Suspicion of malignancy
- Ulcers that have not healed within 3 months
- Peripheral arterial disease (ankle brachial pressure index <0.8)
- ABPI above 1.2
- Diabetes mellitus
- Rheumatoid arthritis/vasculitis
- Healed ulcers with a view to venous surgery.

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