Background and objective: The disease of reticular veins and telangiectasia of lower extremity are very common. Regular treatments of compression stockings and medicines offer limited relief and are not curative. This research is to study the efficacy, safety and patient satisfaction of the combination of sclerotherapy and the long-Pulsed 1064nm Nd: YAG laser in treatment of reticular veins and telangiectasia of lower extremity in China.

Methods: From January 2015 to July 2016, excluding deep and superficial veins valve insufficiency of the lower extremity through duplex ultrasonography. Patients with simple reticular veins and telangiectasia of the lower extremity were treated with sclerotherapy combined with Nd: YAG 1064nm laser therapy.

Results: Of the 136 patients: cured in 87 cases, significantly effective in 45 cases, effective in 4 cases, total effective rate is 100%. There were no severe complications in all cases.

Conclusion: Sclerotherapy and Nd: YAG1064 nm laser are for different stages of the treatment process and different caliber of blood vessels. A combination treatment of sclerotherapy and Nd: YAG 1064nm laser for reticular veins and telangiectasia of lower extremity is safe, simple and effective.

INTRODUCTION

Telangiectasias and reticular veins are dilated visible small superficial veins which occur on skin, telangiectasias are defined as 0.1-1.0mm in diameter and reticular veins between 1 to 3mm [1]. They are very common disease in the population, with a German epidemiology study reporting that 59% of the adult population suffer from isolated telangiectatic or reticular veins of the legs, which is more prevalent in women [2]. Telangiectasias and reticular veins are not only cosmetic problems but reasons for pain, cramps, burning, throbbing, itching, leg fatigue and venous hypertension [3]. In China, with the improvement of living standards and health consciousness in recent years, the general populations have paid more attention on their external image and tend to treat their reticular veins and telangiectasias. However, at present the treatment of reticular veins and telangiectasias of lower extremities has been seldom reported in China. As for treatment methods, the golden standard is sclerotherapy, which is a wide and cheap technique but still has limitations. As a new technic, Nd: YAG 1064 nm laser treatment has demonstrated great therapeutic effect in blue and purple telangiectasias on lower extremities. Previous study indicated that a combination of Nd: YAG 1064 nm laser and sclerotherapy may have a better result [4]. Here we summarize our experience of combining Nd: YAG1064 nm laser and sclerotherapy to treat reticular veins and telangiectasias of lower limbs.

MATERIAL AND METHODS

Patients

The study was approved by the ethics committee of Shanghai ninth people’s hospital. Patients signed consent after full information. All patients underwent a clinical examination and duplex ultrasound imaging of their veins. They were devoid of reflux lasting more than 1 second in the deep veins, saphenous trunk, saphenous junction, saphenous tributaries, or perforating veins. All had fully compressible deep and superficial veins. Further exclusion criteria were: (1) seriously allergic to alcohol; (2)recent thrombosis; (3) the pregnancy; (4) lower limb ischemia; (5) local or systemic infection ; (7) symptomatic patent foramen ovale.

Medicine and instrument

0.5% polidocanol (Aethoxysklerol; Kreussler Pharma,
Procedure

Injections were performed with a 2 ml silicone syringe and a 30 G needle. Here we used sclerosing foam of polidocanol, the method to prepare sclerosing foam is the same as what Tessari reported in 2000 [4]. The liquid: gas (room air) ratio for production of the foam was 1:4, the exact volume at each site of injection depended on the range of the telangiectasias and reticular veins. The maximum volume of foam given at each injection site was 1 ml. Reticular feeding veins were injected prior to injection of the telangiectasias. Patients remained supine for 5 minutes after the last injection. A thigh-length stocking (23 to 32 mm Hg) was applied respecting the individual lower limb dimensions. Patients were asked to wear the compression stockings all the time for 1 week then to wear it in the day and to remove it during night time for another 3 weeks.

After one month, a high peak power, long-pulse Nd: YAG laser system (Gentle YAG, Candela) was applied to treat residual telangiectasias. The laser has a wavelength of 1064 nm, a maximum peak power of 26.33 W, and pulse duration ranging from 0.25 to 300 ms. Maximum fluence that can be delivered by this system is 600 J/cm². Spot sizes are adjustable from 1.5 to 18 mm at the level of the hand piece. Epidermal cooling was achieved with cryogen cooling system that is administered to tissue by the hand piece. The patients were reviewed and treated at 4-week intervals.

Assessment

At least 2 experts blinded to the interventions studied the photographs taken before and one month after treatment. Assessment was made according to degree of reduction of the blood vessels. Grade of response were categorized on four classifications: 1. Clear; 2. marked improvement; 3. Partial response; 4. poor response or no change. The total effective rate = (clear cases + marked improvement cases + Partial response)/ total number of cases. Each patient was given a questionnaire, asking their satisfaction with the treatment effect (very unhappy and dissatisfied, satisfied and very satisfied).

RESULTS

Between January 2015 to July 2016, a total of 136 female patients with telangiectasias and reticular veins were included in our hospital. Of all the 136 patients, every patient need 1 injection, the average volume of foam injected was 8 ml and the maximum volume was 10 ml per patient. 82 patients underwent later laser treatment. 41 patients had 1 laser treatment, 28 for twice, 10 for 3 times and 3 for 4 times. Of 136 cases, cleared for 87 cases (63.97%), 40 cases were markedly improved (29.41%), partial response in 9 cases (6.62%), the total effective rate was 100%.

During the treatment, none of the patients suffered serious adverse events. Immediately after laser, the urticarial reaction was often observed and swelling was self-limited. Urticarial reactions disappeared a few hours after treatment, 2 cases extended to 3 days after treatment, 4 cases had granular blister. Most blisters turned thin or dry within 7 days. The pigmentation after sclerotherapy was evident for some days, weeks, and rarely up to 5 months after treatment. No special treatment was needed after treatment. There were no serious complications, such as deep vein thrombosis and pulmonary embolism. Mild local pigmentation still remained in 2 cases, no pigment loss or scar. Pictures before and after treatment as shown in Figure 1.

DISCUSSION

The treatment of telangiectasia and reticular veins of lower extremities has drawn much attention. Conventional treatment like compression stockings is usually ineffective, while drugs like sodium aescinate have no effect. The prevalence of telangiectasia and reticular veins of lower limb is high [2]. The etiology is not clear and it may be associated with hormone secretion conditions and lack of physical activity, standing/sitting for long periods. There is an increasing population especially young female seeking to treat their telangiectasia and reticular veins because of health and cosmetic reasons.

Compression Sclerotherapy has been used in the treatment of venous disease for decades of years. Orbach reported foam sclerotherapy treatment in 1944. In 1997 it was reported that using foam sclerotherapy to treat truncal venous disease made the clinical effect better because the foam displaces blood and
this increased the interaction with the vessel wall area, which reduced the concentration and dosage of agent and made the treatment safer by reducing the volume of liquid sclerosant required. Whereas foam sclerotherapy may lead to higher risks of hyperpigmentation than liquid sclerotherapy, which clears spontaneously within 6–24 months in most cases [5]. Most doctors prefer to use liquid sclerotherapy rather than foam sclerotherapy for the treatment of leg telangiectasia. There exists debate between foam sclerotherapy and liquid sclerotherapy, but in our practice, foam sclerotherapy showed its safety and convenience, which made us choose foam sclerotherapy. Tessari reported a method to prepare foam in 2000, which was very simple and practical. In our study the dose and operation procedure were strictly controlled and there were no complications mentioned above.

Sclerotherapy has been used widely for varicose veins [10-13]. Vascular surgeons and dermatologists treat telangiectasia and reticular veins with sclerotherapy, but for the telangiectasia whose diameter less than 1mm, it is difficult to make successful puncture. Telangiectasia may gradually occlude and disappear after sclerotherapy, but many still remain.

In recent years, laser has been widely used in the treatment of vascular disease [14-18]. Most researches about laser are on facial telangiectasia [19,20]. PDL has been proven to have excellent effect for lesion on face, but not suitable for telangiectasia of lower extremities because of its limited penetration ability. On this point, 1064 nm Nd: YAG laser shows its advantage.

Parlar and his colleagues carried on a prospective, comparative, randomized, open-label trial on treatment of lower extremity telangiectasias in women by foam sclerotherapy vs. Nd: YAG laser, the conclusion is telangiectasias of the lower extremities can be successfully treated with either synchronized long-pulsed Nd: YAG laser or sclerotherapy [5]. However, in one previous small pilot study involving fourteen patients, the best results seemed to be achieved when sclerotherapy is first used followed by a laser treatment [6].

For the patients of our study, the residual telangiectasia after sclerotherapy injection was treated with 1064nm Nd: YAG laser. This helped to make up with the deficiency of sclerotherapy and achieved good effect. The laser’s dynamic cooling system can prevent skin burns and other postoperative adverse reactions. Our past experience shows that blister often develops in patient who has dark and thin skin. In addition, improper laser parameters also lead to blister, including wavelength, spot Size, pulse duration and multilayer overlapping.

In China, with the development of economy and the improvement of living standards, people’s cosmetic demand is increasing. More pursue treatment of telangiectasia and reticular veins of lower extremities for social life needs. In this study, the sclerotherapy was applied combined with 1064 nm Nd: YAG laser. These two methods play roles at different stages in the treatment process for different diameter of blood vessels, which obtained satisfactory effect. In the future there should be more research with more cases and with longer follow-up time.

Table 1: List of complications of all patients underwent sclerotherapy and laser treatment.

<table>
<thead>
<tr>
<th>Complications</th>
<th>No. (%) of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients received sclerotherapy alone</td>
<td></td>
</tr>
<tr>
<td>Pain and erythema</td>
<td>41 (75.9 %)</td>
</tr>
<tr>
<td>Transient postinflammatory hyperpigment</td>
<td>42 (77.8 %)</td>
</tr>
<tr>
<td>Bruising</td>
<td>0 (0 %)</td>
</tr>
<tr>
<td>Granular blister</td>
<td>1 (1.85 %)</td>
</tr>
<tr>
<td>Focal thrombosis</td>
<td>15 (27.8 %)</td>
</tr>
<tr>
<td>Erosion and crusting</td>
<td>3 (5.6 %)</td>
</tr>
<tr>
<td>Patients received sclerotherapy in combination with the laser (number=82)</td>
<td></td>
</tr>
<tr>
<td>Pain and erythema</td>
<td>68 (82.9 %)</td>
</tr>
<tr>
<td>Transient postinflammatory hyperpigment</td>
<td>59 (72.0 %)</td>
</tr>
<tr>
<td>Bruising</td>
<td>3 (3.6 %)</td>
</tr>
<tr>
<td>Granular blister</td>
<td>3 (3.6 %)</td>
</tr>
<tr>
<td>Focal thrombosis</td>
<td>16 (19.5 %)</td>
</tr>
<tr>
<td>Erosion and crusting</td>
<td>5 (6.1 %)</td>
</tr>
</tbody>
</table>

Table 2: The satisfactory degree of patients.

<table>
<thead>
<tr>
<th>Patient satisfaction</th>
<th>3 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Dissatisfied</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Satisfied</td>
<td>59</td>
<td>28</td>
</tr>
<tr>
<td>Very Satisfied</td>
<td>67</td>
<td>101</td>
</tr>
</tbody>
</table>

REFERENCES


