Topical Scar Modification: Hype or Help?

Of the many topical scar modification treatments available, silicone gel sheeting is the only product shown to be effective for the treatment of hypertrophic scars. Other topical scar treatments are frequently used without evidence of their efficacy. The authors discuss available topical scar treatments and their current role in clinical plastic surgery practice. (Aesthetic Surg J 2005;25:304-306.)

Topical treatments designed to minimize scarring have been available since the 1970s; however, in the past few years, the number of products claiming to reduce scars has increased. There are now more than 2 dozen such products, and many of these are marketed directly to the consumer. Here, we discuss what these products are, how effective they are, and to what extent plastic surgeons are using them.

Most topical treatments are silicone-based, marketed in the form of silicone gel sheeting or silicone-based ointments. Other topical treatments contain polyurethane or natural plant-based substances. For the most part, the efficacy of these treatments is not supported by prospective randomized controlled clinical trials. The natural tendency for scars to gradually improve over time makes it difficult to objectively quantify the effects of any scar treatment. As a result, there is a relative lack of evidence supporting topical treatments.

There is an effective injectable treatment for hypertrophic scars: intralesional injection of insoluble steroid (triamcinolone 40mg/mL) has been a standard treatment for keloids and hypertrophic scars. In contrast, topical steroids penetrate the dermis poorly and are ineffective in reducing scarring.

### Available Topical Scar Treatment

Silicone gel sheeting was first used for hypertrophic burn scars in 1983 (Table 1). Since then, several randomized clinical studies have shown the effectiveness of silicone gel sheeting in flattening and reducing the stiffness of hypertrophic scars, and in 2002, the International Advisory Panel on Scar Management recommended silicone gel sheeting as an evidence-based treatment for scar modification.

The mechanism that makes silicone gel sheeting an effective scar treatment is not clear but, possibly, may include its effect on growth factors such as TGF beta and basic FGF, and its effect on the hydration of wounds due to the semioclusive properties of the sheeting.

More recently, products containing silicone in the form of an ointment, rather than solid sheets, have appeared on the market. Despite manufacturers’ claims, the ability of these products to improve scarring has not been established by clinical trials.

Other products that lack evidence supporting effectiveness include Mederma (Merz Pharmaceuticals, Greensboro, NC); adhesive tape; polyurethane; and Duoderm (Convatec, Princeton, NJ). Mederma contains allium cepa, an onion extract; there are no clinical or animal studies to demonstrate that it either prevents or improves pathologic scars. Similarly, evidence for the other products is largely anecdotal.

### Efficacy

Topical treatments have little effect in patients who scar favorably. There is currently no evidence that routine use of any topical treatment will influence the appearance of scars in these low-risk patients. For patients with a high risk of hypertrophic scarring, the application of silicone gel sheeting, and this alone, has been shown to reduce the risk of pathologic scarring. Remember, however, that the nature of hypertrophic scars is spontaneous improvement over time. There is no evidence that topical treatments work for the prevention or treatment of keloids.
Clinical Use of Topical Scar Treatments

To assess clinical practice patterns regarding topical scar therapy, we used a detailed questionnaire to survey 80 academic and community plastic surgeons attending The American Society of Plastic Surgeons symposium in San Francisco, November 2004 (Tables 2 and 3). Results are as follows:

- More than 50% of plastic surgeons surveyed said that at least 25% of their patients ask about these products.
- Forty-four percent of surgeons surveyed recommend these products to at least half of their patients.
- Eighty-one percent of surgeons surveyed have been using these products for more than 1 year.

Despite the fact that 89% of surgeons surveyed used some form of topical treatment for scar reduction, they expressed a relative lack of confidence in the efficacy of

Table 1. Products available for scar treatment

<table>
<thead>
<tr>
<th>Product</th>
<th>Pattern of use</th>
</tr>
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<tbody>
<tr>
<td>Silicone gel sheeting</td>
<td>79%</td>
</tr>
<tr>
<td>Silicone gel</td>
<td>26%</td>
</tr>
<tr>
<td>Mederma</td>
<td>30%</td>
</tr>
<tr>
<td>Cica-care</td>
<td>17%</td>
</tr>
<tr>
<td>Neosporin scar</td>
<td>16%</td>
</tr>
<tr>
<td>Curad Scar</td>
<td>14%</td>
</tr>
<tr>
<td>Kelocote gel</td>
<td>11%</td>
</tr>
</tbody>
</table>

Table 2. Topical scar treatment use by 80 plastic surgeons

| Use topical treatments | 89% |
| Always use topical treatment | 18% |
| Never use topical treatments | 11% |

Clinical Insights

Figure 1. Demonstrates confidence level of plastic surgeons in products. Plastic surgeons were asked, “How confident are you that the product is effective?”

Figure 2. Demonstrates percent of patients in whom plastic surgeons see the effect of topical scar treatment. Plastic surgeons were asked, “In what percent of patients do you see a result?”

Table 3. Most commonly used products
such treatment (Figure 1). Only 40% of plastic surgeons noted a positive effect of topical treatment more than half of the time, and 6% actually doubted efficacy (Figure 2).

There was also great variability in the timing of when the products were used. About 50% of the respondents who use topical products for scar reduction reported starting patients on treatment only if scars looked problematic; 27% began treatment as soon as sutures were removed; 11% percent reported treating only high-risk patients who requested it; and 6% initiated treatment in high-risk patients only.

Eleven percent of surgeons reported that they did not use topical treatments. The reasons cited for not using these products were as follows: 67% doubted their efficacy, 44% felt that there was insufficient data to support their use, 33% determined that the products don’t work, and 22% objected to the cost of these products.

**Conclusions**

Despite the frequency with which topical scar treatments are used, the evidence for their efficacy is not compelling. Only silicone gel sheeting has been shown to be effective and, then, only for the treatment of hypertrophic scars—not for the prevention of scars in low-risk patients or for treating keloids. Plastic surgeons use the products, but not with a high degree of confidence. The basic principles of evidence-based medicine require that the benefit of a treatment be substantiated by clinical studies, not anecdotal reports. Physicians and surgeons should be watchful to avoid the use of unproven products, and should insist that these topical agents be marketed with published results of clinical trials supporting a treatment benefit.

**References**


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