Background: Currently available methods for permanent removal of unwanted body hair are either slow or may result in painful side effects or scarring.

Objective: The authors investigated the safety and effectiveness of galvanic current by patch and probe technique as a method of permanent hair removal.

Results: Microscopic evidence confirmed that galvanic current treatment using either a probe or patch technique induced alopecia through perifollicular fibrosis. Hair counts indicated that this treatment was equally or more effective than wax-only or electrolysis treatments at 12 and 15 weeks after commencement of treatment. Clinical observation suggested that it caused less irritation or discomfort to patients.

Conclusions: Preliminary investigations indicate that galvanic current treatments are a fast, safe, and effective means of permanent hair removal. Further evaluations of longer-term treatment effectiveness are underway. (Aesthetic Surg J 2004;24:442-445)
Permanent Removal of Unwanted Hair

Figure 1. A, Biopsy scan power view of a treated hair in the bikini area of patient 1 at an early stage of treatment shows an intact hair follicle with bulb. The hair could easily be removed if tugged on. B, The follicle in the telogen phase shows no reaction, demonstrating that the treatment only acts on growing hair follicles.

Figure 2. A, B, C, One year after beginning treatment in patient 1, a second biopsy of the bikini area shows very few hair follicles. Only 1 or 2 were found in an area that should have at least 8 to 10 small and large hair follicles. HS, hair shaft; HF, hair follicle.

Figure 3. A, After 15 treatments, biopsy scanning power view of axillary skin in patient 2 shows that some large follicles have been changed to small follicles with beginning perifollicular fibrosis, indicating that destruction of the hair follicle has begun. Nml, normal follicle; SM, small follicle. B, Higher-power view of the small follicle shown at left in part A. C, Higher-power view of the bottom portion of the same follicle. Minimal perifollicular fibrosis is seen around the small hair bulb. D, Higher-power view of the small follicles at right in part A. Perifollicular fibrosis is seen around part of a follicle having late catagen phase features. Perifollicular fibrosis is more evident in the catagen stage because the follicle was treated in the anagen stage. Note the uniformity of the fibrosis, suggesting treatment of the entire follicle, including the stem cell at the base of the arrector pili muscle.

trolysis treatments of 4 body areas in 18 patients were compared with galvanic current treatments using either a surface probe or skin electrodes (patch). The body areas treated were the right underarm, left underarm, right bikini area, and left bikini area. Treatment duration was 12 weeks. The probe and patch sites were waxed at
Results

Hair counts decreased by 46% at sites treated by wax only versus 60% at sites treated by electrolysis or by galvanic current; these differences were not statistically significant (Table 1). A comparison of the underarm and bikini areas showed that these areas responded well to all treatments (Table 2). Representative biopsy results from one patient are illustrated (Figure 4). There appeared to be no regrowth of hairs that had been removed by any of the 4 modes of treatment. However, less hair loss occurred after discontinuation of treatment using the wax-only method compared to hair loss after discontinuation of treatment using the other 3 methods.

The electrolysis-treated areas had to be blocked by local anesthesia in order for the subjects to tolerate the procedure. It was observed at the 15-week hair count that the electrolysis site still displayed irritation of the skin. The wax sites displayed a lesser degree of irritation, with ingrown hairs in some cases. No ingrown hairs or irritation were found at the probe and patch sites. Two patients did report some skin irritation when using the conduction cream with the probe galvanic current method. The irritation stopped after the conduction cream was replaced with the gel form of the conduction product.

Discussion

The effectiveness of hair removal using the galvanic current method matched or exceeded that attained using electrolysis, the current standard treatment for permanent hair removal. The galvanic current method also appears to cause less skin irritation or discomfort than either the wax-only method or electrolysis.

Conclusion

There are strong indications that use of the galvanic current treatment reduced the number of active hair follicles by 80% to 90%. Clinically and histologically, the treated sites showed evidence of damaged hair follicles and induced pattern alopecia. Preliminary results indicate that the treatment is easier, faster, more comfortable, and

Table 1. Hair loss using different removal methods

<table>
<thead>
<tr>
<th>Method</th>
<th>At 12 weeks</th>
<th></th>
<th>At 15 weeks</th>
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<tbody>
<tr>
<td></td>
<td>Average #</td>
<td>Average %</td>
<td>Average #</td>
<td>Average %</td>
</tr>
<tr>
<td>Wax only</td>
<td>43.61</td>
<td>54.13</td>
<td>50.56</td>
<td>62.76</td>
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<tr>
<td>Electrolysis</td>
<td>51.78</td>
<td>57.53</td>
<td>65.69</td>
<td>72.99</td>
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<tr>
<td>Surface probe</td>
<td>51.67</td>
<td>54.80</td>
<td>70.92</td>
<td>75.22</td>
</tr>
<tr>
<td>Skin electrodes</td>
<td>49.94</td>
<td>56.07</td>
<td>62.77</td>
<td>70.48</td>
</tr>
</tbody>
</table>

Table 2. Response of underarm and bikini areas to all treatments

<table>
<thead>
<tr>
<th>Method</th>
<th>At 12 weeks</th>
<th></th>
<th>At 15 weeks</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average #</td>
<td>Average %</td>
<td>Average #</td>
<td>Average %</td>
</tr>
<tr>
<td>Right underarm</td>
<td>46.11</td>
<td>50.00</td>
<td>65.67</td>
<td>71.73</td>
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<tr>
<td>Left underarm</td>
<td>47.78</td>
<td>49.40</td>
<td>68.11</td>
<td>70.42</td>
</tr>
<tr>
<td>Left bikini</td>
<td>51.67</td>
<td>62.33</td>
<td>59.17</td>
<td>71.38</td>
</tr>
<tr>
<td>Right bikini</td>
<td>51.44</td>
<td>62.56</td>
<td>57.08</td>
<td>69.42</td>
</tr>
</tbody>
</table>

*Conclusions are based on an analysis of variance (ANOVA) for the procedures in question, using the data for weeks 12 (ANOVA with F distribution with df 3, 56; F-value .286; MSE 704.359; for an a-level of .05) and 15 (ANOVA with F distribution with df 3, 38; F-value .593; MSE 869.475; for an a-level of .05).
equally or more effective than other methods of permanent hair removal.

This study will be continued with hair counts at 3, 6, and 12 months to determine the long-term effects of the galvanic current method of permanent hair removal in 18 patients. We will not treat the wax or electrolysis sites during this time period but will continue to review the probe and patch treatment sites for 1 year.

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Suggested Reading


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