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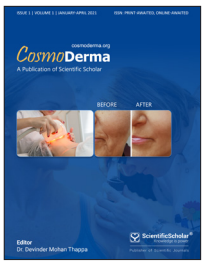

Innovations

2 in 1 disposable syringe devices for producing suction blister

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PROBLEM

A disposable syringe was used to develop cost-effective suction devices (suction syringe and suction cup) to treat small resistant stable vitiligo. However, the syringe's length is around 3 or more times its diameter, which is more than enough to meet the minimum height requirement. The device's minimum suction height equals its radius, and its volume is approximately 1.5 times that of the suction blister.[1-3] Furthermore, smaller-sized devices are easier to use and more stable and create a vacuum, especially for a three-way cannula–suction cup device for getting about −1 atmospheric pressure (−760 mmHg) which is difficult in larger syringes. For this, we must cut the syringe and remove the majority of the device, as the three-way cannula-suction syringe

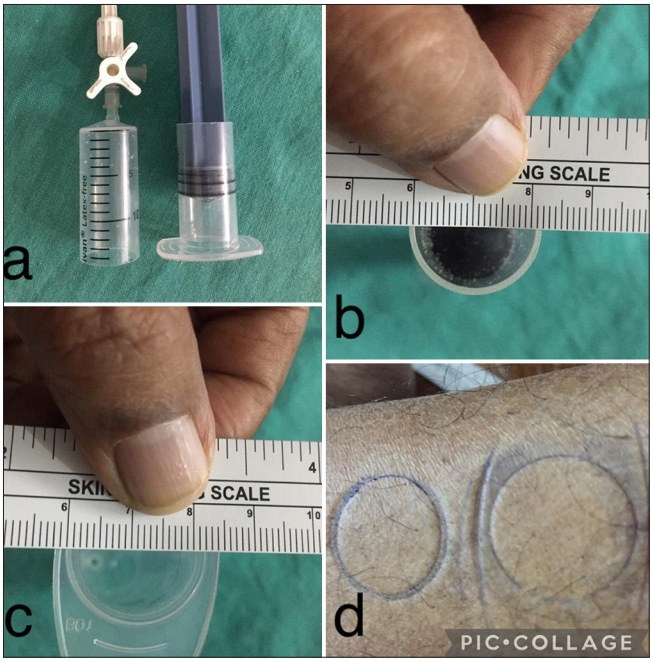

Figure 1: (a) Two suction devices are made with 1 disposable syringe. The differences in the diameter of (b) cup, (c) suction syringe, and (d) its impressions on the skin.

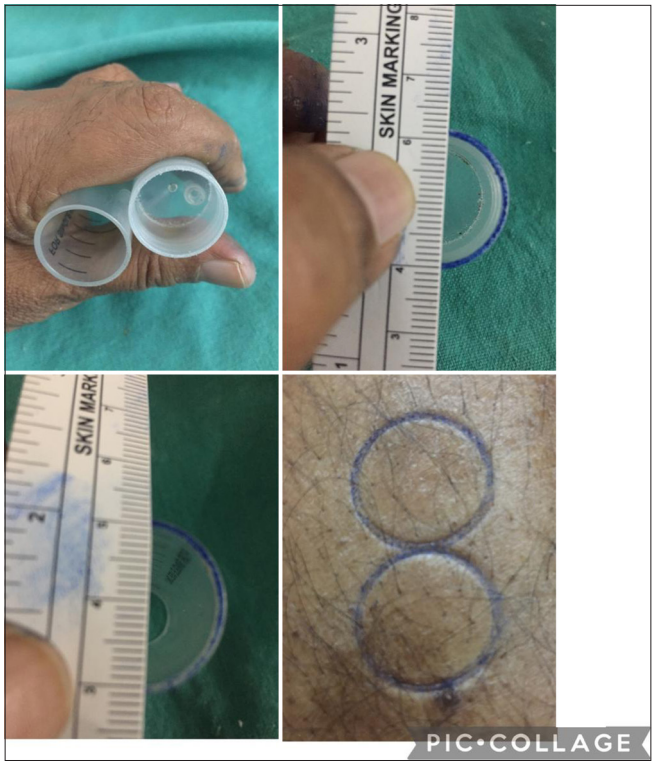

Figure 2: The cut end of syringe is smoothened with heat and sandpaper without significant changes in diameters and its impressions.

and cup device is more commonly used nowadays, despite being less airtight than the direct suction syringe. Due to the various outlets in the three-way cannula and less negative pressure (−350 mmHg−−500 mmHg), it takes 1–2 h for the completion of the suction process with a large syringe. After cutting the syringe, smooth and flat the rim surface and edges to reduce pain and skin discomfort; otherwise, hemorrhage, leakage, and/or incomplete blister formation may occur. We modified the techniques to produce two miniature suction devices (syringe and cup) from a single disposable syringe.

SOLUTION

First, a disposable syringe (10 or 20 mL) is cut into two parts of the desired length with a heated surgical blade (22–26 No.). The syringe's cut ends are next flattened by rubbing them against pumice stone or sandpaper (Nos. 80 and 120). Following that, the flakes on the edges are removed by rubbing with gauze or rough linen, and the device rim is lightly rubbed with a small rectangular piece of sandpaper to make it smoother and less painful to the skin. The smoothness of the device's edges is then assessed using a finger. After being disinfected in glutaraldehyde, the two modified syringe devices are ready to create a suction blister [Figure 1a]. Before suctioning, the air tightness must be checked. To airproof the suction cup, tightly connect the three-way cannula to the device and block the other outlet with gum or fevikwik. However, these complications are uncommon with suction syringes. The suction syringe has a diameter that is roughly 10–20% larger than the suction cup without modifications [Figure 1b-d]. The cut end of a syringe can be made with sandpaper and heated without significantly changing the diameter [Figure 2].

Thus, two smaller airtight suction devices with a smooth surface can be made with a single syringe with little effort and expense. However, producing the smaller suction syringe and its cup is a little bit cumbersome, but it takes only 5–6 min provided that we have all of the necessary instruments on hand, which is shorter than the lengthier time required for suction blisters with larger devices. This twin gadget can be utilized to conduct comparative investigations on the suction process.

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