Case study series: Lifteez aerosol and wipes for the prevention and management of MARSI

KEY WORDS
- Adhesive remover
- Fragile skin
- Lifteez
- MARSI
- Pain
- Skin stripping

Adhesive removers can be used to dissolve the adhesives that are used to attach dressings, pouches and medical devices to the body, and can thus reduce the chance of medical adhesive-related skin injury (MARSI). Skin stripping can occur at any age; however, certain populations are at increased risk, e.g. older people, neonates, and those with compromised skin integrity or multiple comorbidities. This case series evaluates the clinical performance and outcomes of the silicone adhesive remover Lifteez in 10 patients. The acceptability of the product to patients and clinical staff was also evaluated.

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The skin performs six primary functions including protection, absorption, excretion, secretion, regulation and sensation. Healthy skin is smooth, elastic, slightly acidic, does not itch, acts as a barrier to irritants and allergens, and prevents water loss (Cowdell and Radley, 2012).

Medical adhesive-related skin injuries (MARSIs) occur when medical adhesives remove superficial layers of skin, resulting in variable levels of skin damage, such as skin stripping, tension blisters, skin tears, contact dermatitis, maceration and folliculitis. These trauma can persist for 30 minutes or more after removal of the adhesive (McNichol et al, 2013) and will increase following repeated applications of the adhesives.

MARSI can affect anyone using medical adhesives (dressings, tape, stoma or ostomy pouches and tube securement devices); however, MARSI is often seen in inpatient settings and vulnerable populations such as older adults, paediatric patients, those with multiple comorbidities or compromised peri-wound skin integrity. Dressing removal can be one of the most painful aspects of having a wound, so for these vulnerable populations, it is important to limit patient harm by identifying and addressing possible sources of damage, reducing pain, promoting comfort and encouraging concordance with treatment to maximise clinical outcomes and quality of life (Wounds International, 2004).

Although such injuries may seem minor, the financial and nursing time costs can be high, as each MARSI requires an average of 7.8 treatments at a cost of £1.10–£7.90 per treatment application (McNichol and Bianchi, 2016). The cost of MARSI to patients can also be considerable. It can damage the integrity of the skin, which can be so painful that patients are fearful of dressing change and require analgesia prior to dressing change. Skin damage at dressing change also increases the risk of infection, delays wound healing and can increase wound size (McNichol and Bianchi, 2016).

SAFE ADHESIVE REMOVAL

Skin damage at dressing removal is largely preventable if the correct products and techniques are used. Adhesive products can be peeled back slowly at a low angle or the adhesive backing stretched to shear the adhesive from the skin; however, these techniques require force for detachment, which can cause skin tears (Taroc, 2017). In patients at risk of skin damage, skin barrier products, such as films and creams, can provide protection between the skin and adhesives (McNichol et al, 2013). Silicone adhesive-removal products, water, alcohol and emollients can be used to aid adhesive removal, and may reduce the need for pre-emptive analgesia.

Silicone adhesive removal products are recommended, as they evaporate, do not leave a residue and do not dry out the skin (Cutting, 2006; McNichol and Bianchi, 2016; Taroc, 2017). They dissolve adhesives and aid the removal of dressings, tapes, skin protectors/barriers and medical devices (Benbow, 2012), minimising trauma and pain due to

Table 1. Summary of case series using Lifteez aerosol and wipes

Case	Sex, age (years)	Lifteez product used	Wound type, location	Comments at dressing removal before using Lifteez	Comments at dressing removal using Lifteez
1	Female, 80	Aerosol	Skin tear, lower leg	▸▸ 4 out of 10 on the VAS between dressing changes	▸▸ "Didn't feel a thing" ▸▸ Patient became less anxious at dressing removal ▸▸ Lifteez given to patient for future dressing changes
2	Female, 52	Aerosol	Amputation, forefoot	▸▸ Skin trauma and pain (10 out of 10 on the VAS) at dressing removal	▸▸ Dressing removal time decreased from 25 minutes to 2 minutes ▸▸ No pain, and analgesia dosage reduced
3	Male, 56	Aerosol	Surgical wound and stoma, abdomen	▸▸ Extreme pain: 8 out of 10 on the VAS	▸▸ No pain on dressing removal, and analgesia no longer required ▸▸ "Dressing removal was amazing" ▸▸ Lifteez aerosol given to ward staff to use on subsequent dressing changes
4	Female, 91	Aerosol	Pressure ulcer, sacral area	▸▸ Adhesive tape irritated and stripped the skin on removal	▸▸ No pain during and between dressing changes, pre- and post-Lifteez use, potentially due to nerve damage ▸▸ It was possible to use more strongly adhesive dressings that remained *in situ*
5	Male, 74	Aerosol	Suspected pressure ulcer, lateral right foot	▸▸ Low-adhesive dressing required due to fragile skin; however, it would often fall off	▸▸ No pain during and between dressing changes, pre- and post-Lifteez use, potentially due to peripheral neuropathy ▸▸ It was possible to use more strongly adhesive dressings that remained *in situ*
6	Female, 89	Aerosol and wipes	Trauma, lower leg	▸▸ Past dressings had pulled on skin during removal	▸▸ Decreased from 2 to 1 out of 10 on the VAS ▸▸ Patient preferred wipes ▸▸ Lifteez given to patient for future dressing changes
7	Male, 42	Aerosol and wipes	Trauma, lower leg	▸▸ Past dressings had pulled on hair during removal	▸▸ Decreased from 2 to 1 out of 10 on the VAS ▸▸ Wipes more effective at detaching hairs
8	Male, 29	Aerosol and wipes	Mixed aetiology ulcers, lower leg	▸▸ 9 out of 10 on the VAS	▸▸ No pain and analgesia dosage halved ▸▸ Patient preferred wipes
9	Female, 65	Aerosol and wipes	Superficial burn, abdomen	▸▸ 9 out of 10 on the VAS	▸▸ No pain at dressing removal ▸▸ Improved patient compliance
10	Male, 50	Aerosol and wipes	Trauma and burns, upper and lower arm	▸▸ 6 out of 10 on the VAS	▸▸ No stinging on application, and minimal pain at dressing removal (2 out of 10 on the VAS)

Case 10 courtesy of MM and JSH (VAS for pain: 1=no pain; 10=unbearable pain)

the stripping caused by some adhesives. They have also been reported to be pain-free when compared to alcohol-based solutions (Rudoni, 2011).

A service review carried out by stoma care clinicians at St George's Healthcare NHS Trust reported that 91% of patients found it easier to remove their stoma pouch using a silicone-based adhesive remover (Rudoni, 2008). This result reflects the outcome of tests the clinicians performed on themselves, where the removal of stoma pouches after a few hours led to red, irritated skin only in those who were not using the adhesive remover (Rudoni, 2008). A survey assessing the use of silicone and hydrocolloid products in stoma care similarly supported the use of silicone-based adhesive remover; with 96% of stoma care nurses (n=648) recommending it be used when changing stoma pouches (Berry et al, 2007).

LIFTEEZ

Lifteez is an alcohol-free medical adhesive remover containing a mixture of siloxanes. It is available as an aerosol or as wipes. Lifteez aids the removal of adhesive dressings, pouches and medical devices. Its skin-friendly formulation quickly targets and breaks strong adhesive bonds, minimising the potential for skin stripping and pain on dressing removal.

Lifteez should be sprayed evenly or wiped around the skin edge of the adhesive area while the adhesive product is gently pulled away from the

Figure 1. Case 1: On presentation, 2 weeks after injury

Figure 2. Case 2: On initial assessment

skin. When used with porous dressings or devices, Lifteez can be sprayed directly onto the dressing to facilitate removal. Additional spray or wipes can be used if necessary during product removal or to get rid of any adhesive residue. Lifteez dries quickly and, therefore, will not affect the adhesion of any replacement dressing, pouch or adhesive device. Caution should be taken when using Lifteez on delicate or sensitive areas of skin.

CASE STUDIES

The key objective of this case series was to evaluate the clinical performance and outcomes of Lifteez aerosol and wipes for the minimisation or prevention of MARSI and pain at dressing change. The acceptability of the product by clinical staff and patients was also evaluated. All clinicians taking part in the evaluation were given guidance on the recommendations for use, in accordance with the instructions for use. Clinicians were encouraged to use their own judgement on whether to use the aerosol or wipes based on the individual patient's condition. Lifteez was used for up to 1 month and any changes in skin condition and patient comfort were monitored. Clinicians were also invited to comment on the adhesive remover's features, such as ease of use and stinging on application. Ten cases were completed at three different centres, an overview is available in *Table 1.* Cases 1–9 describe longer-duration wounds and are presented in more detail. Case 10 describes two wounds close to full healing and is presented in the summary.

Case 1: Patient with a skin tear and fragile skin (Community Research Team)

Ms P is 80 years old and sustained a Type 1 skin tear (as per the ISTAP skin tear classification; LeBlanc et al, 2018) on her left shin after falling 2 weeks prior. On presentation (*Figure 1*), the wound was dressed with a povidine-iodine wound contact layer and a simple adhesive dressing, which had been in place for 3 days. The skin tear was painful between dressing changes (4 out of 10 on the VAS; 1=no pain; 10=unbearable pain).

As the patient had fragile skin, Lifteez aerosol was selected to aid dressing removal and reduce the risk of skin stripping and pain. There was a small amount of exudate, so a low-absorbent dressing was applied as per local protocol, and changed every 3 days.

At the next dressing change, Lifteez aerosol was used to release the adhesive border, and the patient reported that they "didn't feel a thing". The skin was realigned and after cleansing, a povidone-iodine wound contact layer and simple adhesive dressing were applied to reduce risk of infection.

Throughout treatment, Ms P became less anxious regarding dressing removal as the experience was now entirely pain free and did not cause trauma to the wound area or peri-wound skin. The Lifteez aerosol was given to the patient to use at future dressing changes.

Case 2. Unbearable pain at dressing changes post-amputation (LM)

This is a 52-year-old female inpatient with neuropathic pain and a forefoot amputation due to spreading gangrene. The wound was heavily colonised, and the surrounding skin was red and blanching (*Figure 2*). Between dressing changes, wound pain was rated at 4 out of 10 on the VAS.

An iodine wound contact layer covered with a bordered foam adhesive dressing had been in place for 3 days and required changing three times a week. The patient was reluctant to have dressing changes due to past adhesive-related skin trauma and pain, so oxycodone was administered 30 minutes before dressing change. No medical adhesive remover had previously been used as it was not on the wound care formulary. Dressing removal took 25 minutes, and the pain was unbearable (10 out of 10).

Using Lifteez aerosol at the next dressing change allowed the dressing to be unpeeled easily without skin pulling. The patient described the dressing change as "tender" but not painful, and dressing removal now only took 2 minutes.

The wound was cleansed and a protective barrier film was applied to the surrounding skin. The dressing regimen continued with an iodine and foam dressing as prescribed by the vascular team. The patient did not want the area bandaged.

Lifteez aerosol continued to be used three times a week over the next month to reduce pain

Figure 3. Case 3: Dressings and stoma bag in place (head at top)

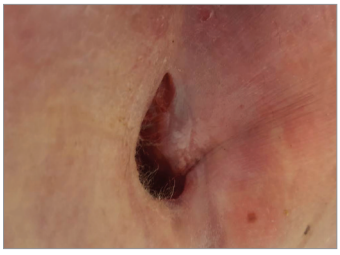

Figure 4. Case 4: After first dressing removal with Lifteez

Figure 5. Case 5: At initial assessment

at dressing removal. The wound was improving and there had been no skin stripping or redness. Pain during and between dressing changes had also reduced, so that analgesia was not as frequently requested before dressing change. As Lifteez aerosol was easy to use, the patient was able to engage in their own care.

Case 3. Lifteez used on abdominal wound dressing and stoma pouch (LM)

Mr A is 56 years old and an inpatient at the rehabilitation unit following 3 months in ICU post-laparotomy. He has a large abdominal wound (18 cm [length] x 5.5 cm [width] x 3.5 cm [depth]) dressed with simple adhesive dressings and in very close proximity to his stoma (*Figure 3*). The first dressing change in the rehab unit was performed by ward nurses, and the patient complained of extreme pain on dressing removal (8 out of 10 on the VAS).

He was referred to the TVN, who used Lifteez aerosol to reduce pain on dressing removal. The patient decided not to take analgesia prior to dressing change. The patient reported the aerosol felt cold; however, the dressing removal was pain free and he described the experience as "amazing". After using Lifteez, the dressing and stoma flange both adhered well to the skin. Lifteez continued to be used at every dressing and stoma flange change three times a week (the stoma flange had to be changed three times a week due to the proximity of the wound).

Case 4. Lifteez used to reduce skin trauma at dressing removal (RC)

A 91-year-old female nursing home resident developed a sacral pressure ulcer after a prolonged period on the floor. The wound was 5 cm (length) x 6 cm (width) x 4 cm (depth) and the peri-wound and wound bed were considered healthy – 100% granulation tissue. The ulcer was not painful, potentially due to nerve damage. An alginate contact layer and adhesive foam dressing had been in place for 1 day. Due to the location of the wound adhesive tape was sometimes required to keep the dressing in place; however, this was irritating and stripping the skin on removal.

The rationale for using Lifteez aerosol was to achieve trauma-free dressing removal. It was hoped that using an adhesive remover would allow application of a more adhesive dressing and so tape would not be required.

The wound was suitable for VAC (vacuum-assisted closure) therapy, so this was initiated along with advice on regular repositioning and nutrition. Over the next week, Lifteez aerosol was used to remove the large film dressing needed for VAC therapy at two dressing changes (*Figure 4*). The dressing peeled off quickly after application of Lifteez. The wound was improving – it had reduced in size and increased granulation tissue was present in the wound bed.

The clinician was very pleased using Lifteez aerosol, especially for very adhesive dressings. Using Lifteez aerosol made it possible to use more adhesive and appropriate dressings for this patient with fragile skin, and reduce the frequency of dressing changes.

Case 5. Suspected pressure ulcer on the foot with fragile skin complicated by diabetes (RC)

A nursing home resident in his 70s has been bed-bound for 1 year. He had diet-controlled diabetes with peripheral neuropathy, so experienced no sensation in his feet. He was admitted with a suspected pressure ulcer present on the lateral aspect of his right foot for 6 weeks. The wound was sloughy, but there was granulation tissue and good epithelisation at the edges (*Figure 5*). Honey ointment was applied to debride, and the wound was covered with a foam silicone dressing.

The dressing was frequently falling off so Lifteez aerosol was selected to allow the use and safe removal of more strongly adhesive dressings that would remain in place for longer. The selected highly absorbent bordered polyurethane foam dressing was scheduled to be changed after 4 days due to its higher adhesive properties.

Lifteez aerosol was used to remove both the original foam silicone secondary dressing, and the subsequent bordered polyurethane foam dressing that was chosen for its stronger adhesive properties. In both cases, the peri-wound area was less red following removal, especially where the dressing had previously adhered. The use of Lifteez did not interfere with the application of a new dressing. Dressing regimen continued with

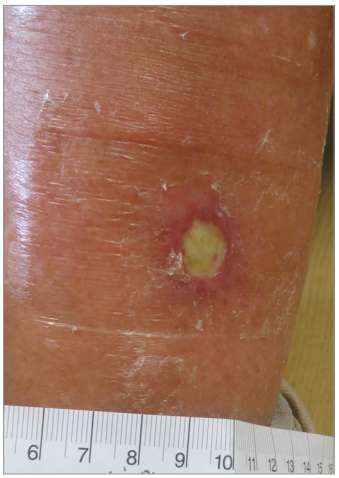

Figure 6. Case 6: After dressing removal using Lifteez aerosol

Figure 7. Case 6: After dressing removal using Lifteez wipes

Figure 8. Case 7: Dressing removal with Lifteez wipe

dressing changes scheduled for every 4 days.

With the use of Lifteez, a more strongly adhesive dressing could be used for this patient with fragile skin, and removed without causing skin trauma.

Case 6. Reducing pain and skin trauma in an older patient with fragile skin (Community Research Team)

An 89-year-old female patient had a trauma wound to her left lower leg present for 1 week. A hydrogel dressing with a simple adhesive secondary dressing had been in place for 5 days. The patient had fragile skin and reported that, in the past, dressing removal had pulled on her skin. As such, Lifteez aerosol was selected as a medical adhesive remover to reduce skin trauma. The patient experienced slight discomfort (2 out of 10 on the VAS) but no stinging on application (*Figure 6*). The wound was cleansed, and a hydrogel dressing was applied to assist autolytic debridement, affixed with an adhesive dressing for low-exuding wounds.

Over the next week, Lifteez aerosol and wipes were used at two dressing changes to reduce skin pulling and trauma. The patient preferred the use of the wipes so these were continued. No skin injury was observed despite the use of adhesive dressings on the fragile skin (*Figure 7*). Lifteez products were given to the patient for her next appointment with the district nurse to assist in dressing removal. The patient commented that these dressing changes were better than previous dressing changes of other wounds.

Case 7. Patient with a trauma wound (Community Research Team)

This patient is in his early 40s and is known to misuse alcohol. He sustained a superficial trauma laceration to his left lower leg, with healthy surrounding skin, which was treated with a hydrogel and simple adhesive dressing. During previous dressing removals of other wounds, pain would be 3 out of 10 on the VAS as the adhesive would often pull on his leg hair.

Lifteez wipes were used to facilitate a less painful dressing removal (*Figure 8*), and the patient rated the pain as 2 out of 10. The wound was cleansed, and a silver wound contact layer and simple adhesive dressing were applied to reduce inflammation.

At the next dressing change 4 days later, Lifteez wipes were used again and no pain was reported. The patient also felt calmer, as he knew dressing removal would be less painful using the Lifteez wipes.

Three days later, the Lifteez aerosol was used to release the adhesive secondary dressing, and a wipe was used to detach some hairs. The secondary dressing was changed to a soft silicone-bordered dressing as the patient was changing the dressing between appointments due to increased exudate levels. Lifteez wipes were continued for this patient to more easily detach hairs from the dressing.

For patients who may pose challenges to care giving, creating a positive dressing change environment can improve compliance, comfort and confidence.

Case 8. Patient with complex leg ulcers and very painful dressing changes (LM)

A 29-year-old man with multiple comorbidities had bilateral mixed aetiology lower limb ulcers present for 8 months. The surrounding skin was dry and flaky, and the wounds were very sloughy and painful (5–6 out of 10 on the VAS).

Past dressing removal had been very painful (9 out of 10), but had not caused skin stripping. The patient would take oral oxycodone hydrochloride 5 mg 30 minutes before dressing change, and no medical adhesive remover has been used before as it was not on the wound care formulary.

Lifteez aerosol was selected to reduce pain while removing a manuka honey dressing and foam adhesive dressing, which had been in place for 3 days. The dressing lifted at the edges, taking less than 25 minutes to remove (previous dressing changes had taken 1 hour). The patient scored his pain at 8 out of 10 and did not like the spray sensation, so Lifteez wipes were planned to be used next time.

After cleansing and debriding, a barrier film was applied to the surrounding skin. Due to previous painful experiences from other dressings, an adhesive foam secondary dressing was applied by patient request, with no bandage due to the very hot weather.

Over the next week, Lifteez wipes were used at two scheduled dressing changes. The wipes were gentle and soothing on the skin and it took

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10 minutes to remove the dressing. It was the first time the patient had "enjoyed" dressing change since the wound developed. His pain at dressing change reduced so much that his analgesia dose was halved.

Case 9. Very painful blistered burn to abdomen (RC)

A woman in her 60s was a temporary nursing home resident for respite care. She sustained a small scald above her belly button after using a hot water bottle for cramps. Honey ointment was applied to treat the burn, and covered with a simple adhesive dressing. The dressing had previously been very painful to remove (9 out of 10 on the VAS) and caused some minimal skin stripping.

There was a risk that dressing removal would pull and rupture the blister, so Lifteez wipes were selected to aid dressing removal. The patient reported that dressing change was "much less painful" (5 out of 10) than previous occasions, and it took half the time (10 minutes to 5 minutes).

The management regimen continued for the next week, with Lifteez aerosol used at both dressing changes. The aerosol was easier to use than the wipes, and the dressings peeled off very easily. The blister remained intact, and the patient experienced no pain.

This wound had the potential to worsen, especially from previous skin stripping. Using Lifteez reduced the risk of further damage and gained the trust and compliance of the patient who had in the past experienced very painful dressing changes.

SUMMARY OF CASE STUDIES

Clinical feedback determined that the experiences of using Lifteez were, overall, very good when considering a range of factors. Clinicians were asked to evaluate, in particular, ease of application, patient comfort during application and pain on subsequent dressing removal. For each of these categories, the clinician was asked to rate Lifteez as being 'poor', 'fair', 'good', 'very good' or 'excellent'. The majority of clinicians rated Lifteez as 'very good' or 'excellent' for the parameters investigated.

In this case series of 10 patients (5 men, 5 women; age range 29–91 years), Lifteez removed dressings quickly and easily, resulting in reductions in pain, risk of skin trauma and use of analgesia during dressing changes. The patients did not experience any pain or stinging on application of Lifteez, and, in cases 2 and 8, oral analgesia was either reduced or no longer required. The application of Lifteez did not interfere with the application of subsequent dressing or stoma applications.

In cases 4 and 5, Lifteez allowed the use of more strongly adhesive dressings that were more appropriate for the wound aetiology and remained in place for longer. For these patients, less frequent dressing changes were required, which allowed for longer undisturbed healing and improved the patient experience. In the longer term, dressing costs and nursing visits would reduce, releasing nursing time to allocate to increasing workload demands. Lifteez was especially helpful in cases when dressing choice was limited (based on resources or patient preference), and a more strongly adhesive dressing had to be used and removed safely, e.g. case 1. The Lifteez wipes also helped to detach the hair from the dressing, e.g. case 7.

Overall, clinicians would use Lifteez products again for people with fragile skin or at increased risk of skin stripping, and some have begun the process of adding it to their formularies. The Lifteez aerosol and wipes were easy to use and often given to the patient or carer to take to future appointments or to complete their own dressing changes. As Lifteez is available as an aerosol or as wipes, the most appropriate format could be selected for each patient to encourage compliance, for example case 6 and 8 preferred the feel of the wipes compared to the aerosol.

CONCLUSION

Lifteez aerosol and wipes have been shown to be clinically effective in removing wound care dressings. In this case study series, healthcare professionals and patients both reported positive feedback during dressing changes using Lifteez products. These clinical case studies demonstrate that Lifteez could have benefits across all care settings to improve patient comfort and compliance with care, and reduce the use of analgesia and nursing time. WUK

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