Blister formation on primary wound closure sites: a comparison of two dressings

Ann Leal and Pam Kirby

Abstract

Background: Blisters often form at the margins of post-operative dressings, most frequently encountered in the specialty of orthopaedics, and there have been many attempts to prevent them forming. After a spate of blistering on postoperative wounds on a gynaecology ward an opportunity arose to trial a new product, OpSite Post-Op, which may help to prevent blister formation. *Aims:* The aim of the study was to compare the current traditional postoperative island dressing that was in use in the department with the new product to demonstrate if blistering could be reduced or resolved. *Methods:* Hysterectomy patients were divided into two groups by dividing the patients according to their surgeon. One group was treated with OpSite Post-Op (trial) and the other with Mepore (control). *Results:* Sixty-seven women were included in the study: 35 in the control cohort and 32 in the trial group. The results were very positive for the trial dressing as no blisters formed in this group whereas eight blisters formed in the control group. *Conclusions:* The new dressing performed well and demonstrated that postoperative wounds need not have the unnecessary complication and discomfort of blistering at the margins. *Conflict of interest:* Smith & Nephew provided dressings for the trial arm of the study.

KEY WORDS

Blistering
Gynaecology
Surgical wounds
Film dressings
Traditional dressings

Simple surgical wounds have not seen much advancement in wound management for the past 30 years. Traditional postoperative dressings have remained largely unchanged because they are both cheap and successful. Surgical wounds generally heal without problems, depending on the patient's comorbidities because there is little tissue loss, asepsis is maintained, tissues are handled gently and each layer is approximated so healing can be quick with minimal scarring (Spry, 2005).

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However, blisters at dressing margins are a recurrent problem which has been relatively ignored as it rarely extends a patient's hospital stay. However, blisters can be very painful or sore and may also lead to postoperative infection because if they burst the first-line barrier against infection is broken leaving the patient exposed to bacterial entry. If we are to enhance the patient experience and reduce the risk of contamination, especially with the rise of resistant bacteria, then this problem must be addressed. This article describes how a study was performed to compare two postoperative dressings in order to evaluate their effect on peri-wound blistering.

Background to the study

At Sherwood Forest Hospitals NHS Foundation Trust, blistering following abdominal surgery on a gynaecology ward had become a concern for healthcare professionals.

Aim of the trial

In line with clinical governance as advised by O'Neil (2001), healthcare professionals should identify ways to provide safer and better care for their patients, adopting good practice and research evidence. The aim of this small-scale study, performed by a tissue viability link nurse and the lead TVN therefore, was to compare two dressings in order to find out if results reported in a study of orthopaedic patients (Cosker et al, 2005) could be replicated in a gynaecology setting in order to minimise risk, increase patient comfort, support patient care and give value for money. The study by Cosker et al (2005) looked at 300 patients who had orthopaedic surgery and compared three postoperative dressings and the incidence of blistering. OpSite Post-Op proved to be superior in that blistering was significantly lower (6%) in comparison with Tegaderm with pad, (16%) and Primapore (24%).

Criteria for comparison

The two dressings — OpSite Post-Op (Smith & Nephew, Hull) and Mepore (Mölnlycke, Göteborg) (the dressing that was then being used on the ward) were examined for:

- Evidence of any trauma or blistering following removal of the dressing
- Ease of removal of each dressing by the nurse
- Discomfort felt by the patient at dressing change
- The dressing's ability to manage postoperative wound leakage
- Non-adherence to the wound interface.

Table 1
Dressing properties according to the manufacturers' product guide

OpSite Post-Op (trial dressing)
- An adhesive film island dressing with a mean wear time of 3.7 days (Jester et al, 2000)
- Microporous to reduce the risk of skin maceration
- Bacteria proof
- Waterproof
- Durable
- Absorbent
- Transparent
- Indications: low-to-moderately exuding wounds

Mepore (traditional dressing)
- An adhesive island dressing, mean wear time of 1.8 days (Jester et al, 2000).
- Air permeable
- Absorbent
- Conforming
- Indications: low-to-moderately exuding wounds

Method

In total, 67 patients were allocated to two groups; the trial group using OpSite Post-Op (*Figure 1*), a film dressing recommended by the previous work O'Neill (2001) and the control group having traditional Mepore dressings (*Figure 2*). There were 35 participants in the control group aged 28–55 years and 32 people in the trial dressing group aged 38–82 years.

There are five gynaecologists in the trust, and one was asked to use the OpSite Post-Op film dressings on all of his patients undergoing abdominal gynaecological surgery over a three-month period. This surgeon was selected as he performed the majority of abdominal hysterectomies which would be simple to supervise. The other four surgeons provided a similar number of patients for the control group who would continue to use traditional dressings on their patients undergoing abdominal hysterectomy.

All dressings were to be removed on the second postoperative day to inspect the wounds and allow patients to bathe or shower, in line with local practice. All nursing staff involved in the trial were asked for their opinions of the two dressings, and all the patients were also asked to comment.

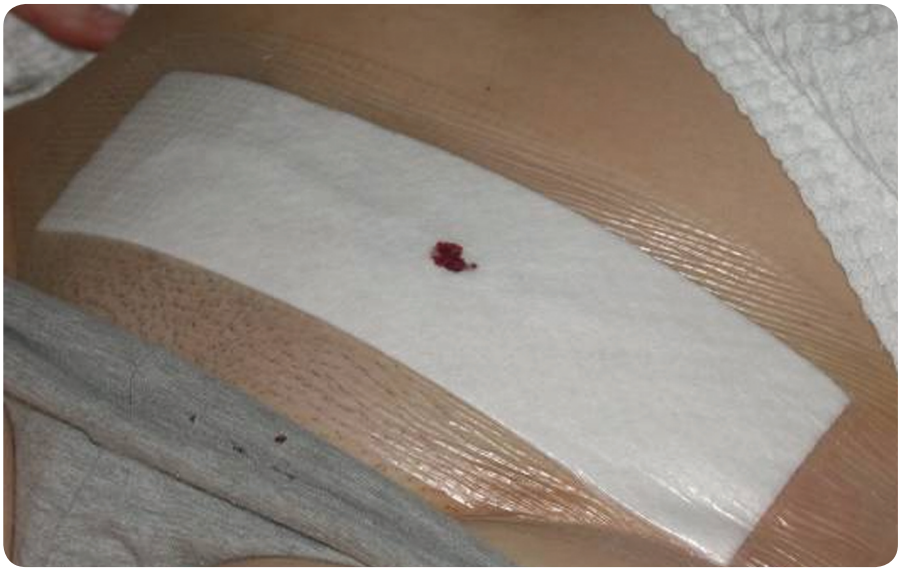

Figure 1. OpSite Post-Op in place on an abdominal wound after a hysterectomy. Strikethrough indicates the need for wound assessment

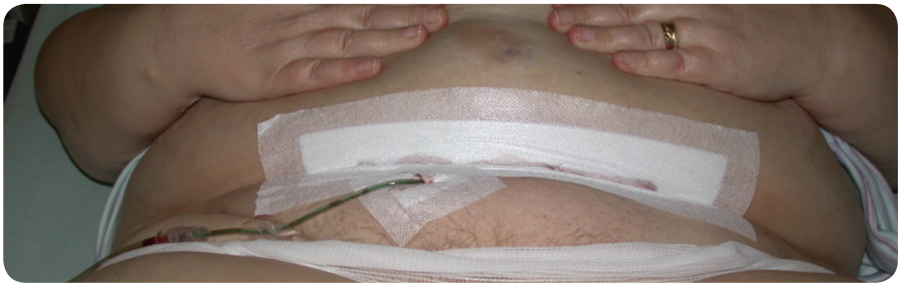

Figure 2. Mepore in place on an abdominal wound after a hysterectomy.

The method of removal was selected according to manufacturers' instructions: the film dressing was stretched to release the adhesive before removal to prevent damage to the epithelium, and removal of the traditional dressing was by peeling away from the skin in the direction of hair growth.

Results

All 67 patients who entered the study completed it and no one dropped out. A summary of the results is featured in *Table 2*.

Assessment of the skin following dressing removal

None of the patients in the trial cohort developed blisters compared with eight patients in the control group (*Figures 3 and 4*).

Ease of removal

The practitioners reported that the film dressing was as easy to remove as the traditional dressing, however, on several occasions the traditional dressing was more adherent to the skin. This was more common in women who had deeper abdominal folds.

Table 2
Summary of results

Product	Mepore	OpSite Post-Op
Numbers of patients	35	32
Numbers of patients with blisters evident following removal	8	0
Ease of removal	Occasional difficulty	Easy
Exudate management	Good	Good
Adherence to wound bed	None	None

Figures 3 and 4. Blisters formed at the margins of the site of the Mepore dressing.

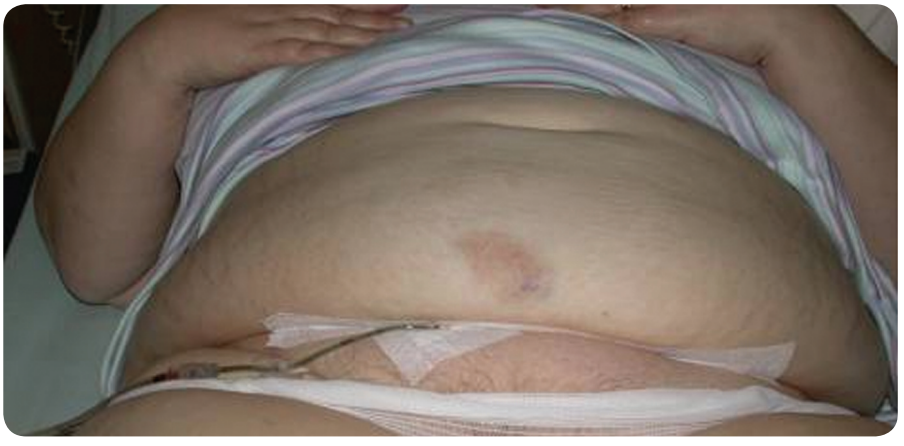

Figure 5. Dressing in position in an abdominal fold.

Skin inspection

Of the patients who had the film dressing applied it was reported that one patient showed some redness of the skin, which resolved within minutes of removal. No other skin trauma was identified in the OpSite Post-Op group.

Ability to manage exudate

Both dressings handled postoperative wound leakage equally as well according to observations on strikethrough by nurses.

Non-adherence to wound interface

Both dressings have a low-adherent surface coating over the absorbent pad, and neither adhered to the postoperative wound in any case.

Discomfort felt by the patient at dressing change

None of the patients complained of any pain, and most of the patients commented that removal was relatively pain-free with both dressings.

Discussion

Performance

The results show that OpSite Post-Op dressing caused no lasting skin trauma, was easy to remove, managed postoperative exudate adequately and was non-adherent to the postoperative wound.

Mepore dressing performed equally well for non-adherence to the wound, and management of postoperative leakage. However, 25% of patients developed blistering of the skin following removal, with all blisters appearing at the margins of the dressing. This was similar to the findings by Jester et al (2000). Both orthopaedic and gynaecological patients experience localised oedema in the early postoperative period. Therefore it could be theorised that blistering may occur because of the adherence of the dressing to the dermis and lack of stretch in the fabric which produces tension at the skin-dressing interface, due to shear and friction on the oedematous skin. This could be further exacerbated by taut application of the dressing.

Removal

A possible cause for difficult removal of the Mepore dressing could have been due to the patient's perspiration. Miller and Glover (1999) have highlighted that shearing forces may be exacerbated by surface moisture which may contribute to blister formation.

Thomas (1996) discusses the importance of the Moisture Vapour Transmission Rate (MVTR) of a dressing, explaining that film dressings have the ability to allow water vapour to pass from beneath the dressing to the external environment thus preventing a build-up of excess moisture. Accumulation of perspiration and secretions on the intact skin beneath the dressing can lead to failure of the adhesive. As a result there is enhanced adhesive in dressings without Moisture Vapour Transmission properties causing it to become more adherent.

It is possible therefore that Mepore has a lower MVTR that could result in increased adherence on patients who perspire more. This was also apparent on larger patients where the dressing was in the abdominal fold and skin was touching skin (*Figure 5*). Larger women with deeper abdominal folds also had increased adhesion of the dressing, possibly due to pressure from the folds, plus an inability for the MVTR to perform when not exposed to the air.

However, all of the blisters were seen at the margins of the wound where the edge of the dressing was sited. This suggests that shear forces are more likely to be the cause of peri-wound blistering as Mepore pulls on the skin as it swells during the postoperative period, causing tension.

Conclusions

Hoban (2005) highlights that patients expect nurses to provide better explanations and evidence-based rationale for choice of products and actions. We are living in a litigious society and patients have increasingly more access to information. It is hoped that this study will give healthcare professionals a greater understanding of postoperative wound blistering and lead to a change in practice with the object of providing and promoting quality care to their patients. In order to make changes at the trust it was important to replicate the orthopaedic study to prove there is a quality gain for patients on a gynaecology ward when switching from Mepore to OpSite Post-Op. Following this pilot study, a short trial period of using OpSite Post-Op on general surgical wards highlighted the additional benefits of being able to bathe or shower in the dressing which added to the evidence collected in this study allowed the dressing to be promoted throughout the trust.

The possible reduction of surgical site infections in so-called 'simple' wounds was also emphasised to help push for change. The cost implications were an initial concern for theatres as they are the provider of the first dressing for each patient and a change to OpSite Post-Op would increase costs. However, strategies made available by reflecting sales figures throughout the trust, enabled the department to pick up discounts, making the switch more acceptable.

The study resulted in a change of practice thus providing safer care for patients undergoing abdominal gynaecological procedures. The change was replicated throughout the trust and there have been no reported cases of blistering since the changeover. WUK

Thanks To Smith & Nephew for providing the dressings during the evaluation period. This study won the authors a highly commended award at the first Wounds UK Awards in June 2006.

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Key Points

- Blisters can often form at the margins of dressings on postoperative wounds.
- Blistering can increase the risk of surgical site infections.
- A small study comparing OpSite Post-Op and Mepore on post-hysterectomy wounds was conducted to find out if there was any difference in the incidence of blistering
- No blisters formed in the group treated with OpSite.