A prospective clinical audit of patient dressing choice for post-op arthroscopy wounds

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Abstract

Background: There is a paucity of data in the published literature as to the true incidence of tape blistering and its association with the use of a particular type of dressing or surgical procedure. *Objective:* This clinical audit was conducted to record the true level of skin blistering in patients undergoing arthroscopy of the knee. A secondary objective was to investigate the level of patient satisfaction with the dressing used. *Method:* The audit was conducted over a 14-month period. Patients were sequentially allocated to management with either OpSite Post-Op or Mepore dressings. *Results:* Blisters developed in 6% of patients managed with Mepore dressings, but were not recorded in the OpSite Post-Op group. Significantly more patients managed with the Mepore dressing developed superficial inflammation of the wound site ($p<0.001$). Patient satisfaction was higher in the OpSite Post-Op group with 86% of patients able to bathe. *Conclusion:* The results confirm the findings of other investigators that choice of dressing may be an important factor in influencing post-operative outcome in otherwise uncomplicated surgery. *Declaration of interest:* None

KEY WORDS

OpSite Post-Op
Mepore
Dressing
Arthroscopy
Wound blisters

Minimally invasive surgery (MIS) has the potential to minimise surgical trauma, pain, and recovery time in many surgical and orthopaedic procedures. Arthroscopy offers advantages over traditional open surgery, to patient and healthcare provider alike, in that procedures are generally less invasive. This results in smaller wounds, increased rates of recovery, reductions in hospitalisation episodes and, therefore, reductions in patient intervention costs (Banta, 1993). Arthroscopy of the knee is a common surgical procedure. Department of Health statistics record 20731 finished consultant episodes of arthroscopic surgery to the knee and 19783 investigative procedures for the period 2003–2004 (Department of Health, 2005).

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Blistering

One potential complication post-operatively is blistering (Cosker et al, 2005). A tape blister is a skin excoriation that occurs under the taped portion of surgical bandages, and can be a source of postoperative morbidity. Tape blisters are caused by the separation of the epidermis from the dermis at the dermal-epidermal junction (Cuzzell, 1990). Tape resistant to stretching contributes to blister formation because of the concentration of forces at the ends of the tape. Tape blisters can be one of the causes of postoperative complications, including wound infection and prolonged length of hospital stay (Hahn et al, 1999). It has been suggested that the creation of shear forces at the dermal-epidermal junction, in association with a decreased blood supply in the dermis, is one of the contributing factors to the development of post-operative blisters (Cuzzell, 1990). To reduce the risk of blistering, care should be taken when selecting the appropriate post-operative dressing.

Although tape blisters are a pervasive clinical problem, their incidence after orthopaedic surgery has rarely been reported in the literature. A recently published audit of blistering after hip surgery reported the incidence of tape-related injuries as 21.4% (Polatsch et al, 2004). Jester et al reported the incidence of blistering as 13% in a quasi-experimental study using a variety of dressings (Jester et al, 2000). In a prospective study of patients undergoing hip or knee surgery, the post-operative blistering rate ranged from 6% to 24% depending on the

Table 1.

Inclusion and exclusion criteria

Inclusion criteria

- Age more than 18 and less than 70 years
- Arthroscopic knee surgery with some intra-articular procedure
- Operating time < 1 hour
- Patients with ASA 0 to ASA1
- Non smoker
- No previous surgical scar in the knee
- Informed consent
- Patient will remain in the study until wound healed/suture removed
- Maximum 10 days treatment

Exclusion criteria

- Patients not willing to participate
- Previous knee surgery within 6 months
- History of peripheral vascular disease
- Arthroscopy wound requiring more than one suture
- Skin disease

dressing used (Cosker et al, 2005). It is clear from this study that the choice of dressing may have a major impact on the rates of blistering in patients undergoing orthopaedic procedures.

Objectives

The objectives of this study were to investigate whether choice of dressing influenced either the incidence of post-operative blistering or patient satisfaction and subjective sense of comfort.

Method

A clinical audit of patients undergoing arthroscopic knee surgery between December 2002 and February 2004 was conducted in the Department of Orthopaedic Surgery at Lewisham University Hospital. Only patients without any significant co-morbidity who had undergone knee arthroscopy with an intra-articular procedure were included in the analysis. *Table 1* lists the inclusion and exclusion criteria.

A sample of 116 patients was allocated sequentially to post-operative management with either OpSite Post-Op®, 5 x 6.5 cm (Smith and Nephew, Hull, UK) or Mepore®, 6 x 7 cm (Mölnlycke Healthcare, Göteborg, Sweden). The study was limited to procedures performed by two orthopaedic surgeons (MB and BG) to control the variable of surgical technique.

All patients had the same type of anaesthesia and aqueous-based iodine as skin preparation. On completion of surgery, a single suture consisting of 3/0 non-absorbable material was used to close the arthroscopy portal. The dressing was applied by the operating surgeon along the longitudinal axis without creating any tensile force. A layer of wool and crepe bandage was then applied to the limb.

All patients were treated with the same post-operative protocol. Patients were instructed to remove the superficial wool and bandage after 48 hours and instructed to perform the first dressing change on day three following index surgery. Patients were assessed on day 10 in the outpatient dressing clinic by the specialist nurse practitioner (HB) where the dressing and suture material were removed. At this time, patients were also interviewed by HB who completed a short questionnaire (*Figure 1*) to record their levels of satisfaction with regard to dressing performance.

Final assessment took place at the outpatient visit on week 6 postoperatively when they were seen by MB or BG. At this visit, any clinical signs of blister formation were recorded and, if a blister was confirmed, a photo was taken to provide an objective record of the wound and to measure its size and shape. Any signs of inflammation were also documented at this assessment. Inflammation was defined as the presence of redness around the portal, or pain or discharge from the wound margin. If a local or superficial wound infection was suspected, a wound swab was taken to obtain a microbiological report. Patients were also monitored by haematological test (white blood cell count, C-reactive protein, and erythrocyte sedimentation rate), and were observed during the course of the study for signs of allergic reaction (defined as an erythematous skin rash without pain or inflammation).

Statistical method

Data was entered into Microsoft Excel 2000 for analysis. Fisher's exact test was used to explore the correlation between dressing type and blistering, inflammation or wound infections. The Fischer's exact test provides a method for comparing the frequency of observations in a small sample size (Cambell and Machin, 1999). The Cochrane-Armitage test for trend of linearity between response variable and experimental variables was used to analyse the questionnaire. This tests for trend in binomial proportions across levels of a single factor or covariate and is appropriate for a contingency table where one variable has two levels and the other variable is ordinal (Cambell and Machin 1999). Statistical analysis was conducted at the 2-sided 5% significance level.

1. How do you rate this dressing? Excellent ☐ Good ☐
   Average ☐ poor ☐ Very poor ☐
2. Have you taken a shower with it? Yes ☐ No ☐
3. Is it easy to apply or remove? Yes ☐ No ☐
4. Does it produce any discomfort or skin irritation? Yes ☐ No ☐
5. Does it hamper your daily activities? Yes ☐ No ☐

Figure 1. Questionnaire used to record patient satisfaction.

Results

Of the 269 patients screened, a total of 116 patients were eligible for inclusion in the audit (*Table 2*). Sixteen patients were excluded from the analysis because of non-compliance with either the dressing regimen or failure to attend a follow-up assessment. Fifty patients in each treatment group were included in the final analysis.

Dressing-related morbidity

There was no statistically significant difference in terms of blistering or wound infection between the two dressing regimens (*Table 3*). Three (6%) Mepore patients developed a tape blister (p=0.24) and one had a wound infection (p=1.00). *Figure 2* illustrates the blistering that was seen in one of the Mepore patients. No OpSite Post-Op patients experienced a tape blister or wound infection. *Figure 3* shows OpSite Post-Op in situ post-surgery, and *Figure 4* shows OpSite Post-Op in place at follow up. Fourteen (28%) Mepore patients had periportal superficial inflammation at the time of suture removal (day 10), and this was significantly greater (p<0.001) than the Opsite Post-Op group where no signs of inflammation were reported. Three Mepore patients had a tape blister and inflammation of the wound.

Table 2

Demographic data

Patient group	OpSite Post-Op	Mepore
Total 116/295	(n=50/57)	(n=50/59)
Exclusion due to non adherence	7	9
Mean age	37.5 (23–50)	36.8 (20–50)
Sex	F37:M20	F31:M28

Table 3

Associated morbidity by dressing type

Morbidity associated with dressing	OpSite Post-Op (n=50)	Mepore (n=50)
Tape blister	0 (0%)	3 (6%)
Inflammation	0 (0%)	14 (28%)
Wound infection	0 (0%)	1 (2%)

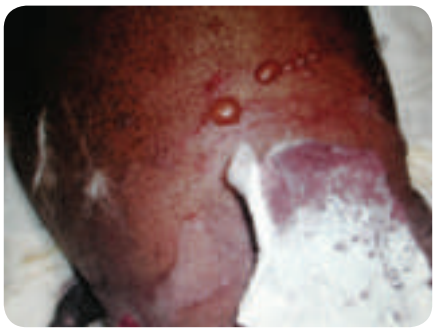

Figure 2. Example of blistering seen in a Mepore-treated patient.

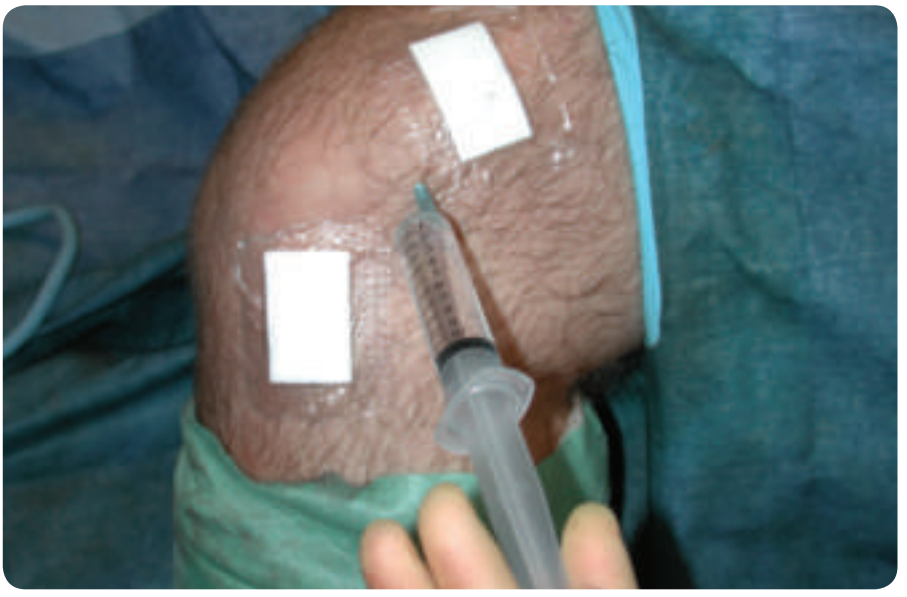

Figure 3. OpSite Post-Op in-situ post surgery.

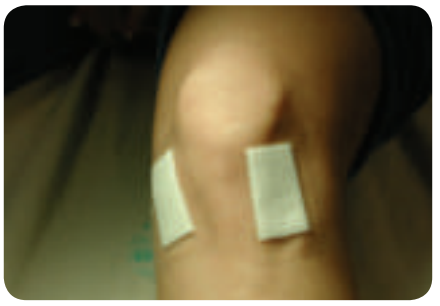

Figure 4. OpSite Post-Op in place at follow up.

Patient's satisfaction

Table 4 shows the results from the questionnaire. Patient satisfaction was significantly better in the OpSite Post-Op group with 90% of patients rating the dressing as excellent *vs* 26% in the Mepore group (p<0.001). No OpSite Post-Op patients, and only 2 (4%) Mepore patients, rated dressing performance as average. None of the Mepore patients bathed while the dressing was in place, whereas 43 (86%) OpSite Post-Op patients were able to bath or shower wearing the dressing.

Discussion

In this clinical audit of the performance of two different dressings, arthroscopic knee surgery tape blisters developed only in the patients dressed with Mepore (n=3; 6%), with 14(28%) patients developing an inflammation in or around the portal.

These results confirm the findings of other studies on the performance of OpSite Post-Op in clinical practice (Wright, 1994; Cosker et al, 2005). Our results also highlight the importance of dressing choice in clinical practice. It is of note that in terms of blistering, the rates reported in the current study are below those reported elsewhere in the literature (Hahn et al, 1999; Jester et al, 2000; Polatsch et al, 2004), but these may reflect differences in surgical technique and the exclusion of patients with peripheral vascular or skin disease

Table 4

Performance of the dressing in terms of patient satisfaction

Patient satisfaction	Opsite Post-Op (n=50)	Mepore (n=50)
Average	0 (0%)	2 (4%)
Good	5 (10%)	25 (70%)
Excellent	45 (90%)	13 (26%)

and smokers from the current audit. Had these patients been included, it would be expected that rates of blistering would have been higher than those recorded. Both dressings were well tolerated and no allergic reactions were reported during the course of the audit.

The ability of patients to bathe or shower post-surgery, while wearing waterproof dressings, is important for patients in terms of quality of life. In addition, other researchers have shown a weak correlation between patients who are able to bathe with waterproof dressings and a reduction in the incidence of infection (Neues and Haas, 2000). Although this association was not investigated in the current audit, it may account for some of the differences in the performance of the two dressings.

The properties of an ideal dressing for arthroscopic surgery have been described elsewhere (Cosker et al, 2005), and include permeability, transparency, ease of removal, ability to act as a bacterial barrier and the ability to remain in situ during bathing. Cost is also an important consideration. The acquisition cost of Mepore (6 x 7 cm) is 10 pence per unit and OpSite Post-Op (5 x 6.5 cm) 17 pence per unit (NHS price, October 2004). The higher unit acquisition cost of OpSite Post-Op may be outweighed in terms of cost-effectiveness by the reduction in blistering and other complications. It is recommended that a robust pharmacoeconomic evaluation is undertaken to explore the potential cost-effectiveness of film dressings used following knee surgery.

We believe that OpSite Post-Op is the dressing of choice in artheroscopic wounds because of its association with a reduction in dressing-related morbidity. This association may be especially important in patients undergoing day-care surgery, as these wounds are mainly managed by the patient in the home setting. Patients in the Opsite Post-Op group were more satisfied with their dressing than patients in the Mepore group. These results show that Opsite Post-Op may be the dressing of choice as it allows the patients to bath while the dressing is in place. In the current audit, the use of OpSite Post-Op was associated with a reduction in the incidence of tape blisters, inflammation and wound infections and had a greater level of patient satisfaction than Mepore.

Limitations

However, this study is limited by the design of sequential allocation to treatment (i.e. the non-randomisation of the patients). Other limitations are the fact that patients were responsible for initiating their own dressing change at 72 hours, and this may have influenced the results. It is recommended that the findings of this clinical audit are confirmed in a clinical trial where patients are randomly allocated to a dressing regimen, and all dressing changes are conducted by trained health professionals.

In summary, this prospective study provides information about a post-operative dressing which may reduce dressing-related morbidity. As a result of this audit we have now stopped using Mepore on surgical wounds within our unit. We have also made a recommendation to change to OpSite Post-Op within the Department of Orthopaedics at our hospital. Further clinical studies are needed to confirm these data. **WUK**

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Summary

- Tape blisters can be one of the causes of postoperative complications, including wound infection and prolonged length of hospital stay.
- One hundred and sixteen patients were allocated sequentially to postoperative management with either OpSite Post-Op or Mepore dressings.
- Arthroscopic knee surgery tape blisters developed only in the patients dressed with Mepore (n=3; 6%) with 14(28%) patients developing an inflammation in or around the portal.

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