

# Improving outcomes for patients following surgery for breast cancer

With the increase in the incidence of breast cancer (National Statistics Online, 2009) is the associated risk of tissue breakdown following mastectomy or reconstructive surgery. Advanced wound care products may not be the optimum choice for these patients who need to achieve rapid and successful healing to resume their life, maintain their body image or progress to further treatment. Negative pressure wound therapy (NPWT) may not traditionally be considered for this type of wound. However, at Doncaster and Bassetlaw Hospitals NHS Foundation Trust it has been used successfully on a number of female patients.

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## KEY WORDS

Mastectomy and breast reconstruction  
Negative pressure wound therapy (NPWT)  
Wound healing

Breast cancer is recorded as being the most common cancer in the United Kingdom (National Statistics Online, 2009) and identified by Cancer Research UK (2009) as the second leading cause of death among women. There are a number of treatment options including surgery, radiotherapy, chemotherapy, hormone therapy and biological treatments — more commonly recognised as the recently controversial Trastuzumab (Herceptin). Where surgery is required, treatment is either mastectomy or lumpectomy, with or without reconstruction of the breast.

The increase in the incidence of breast cancer in the United Kingdom (National Statistics Online, 2009) has

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resulted in the NHS providing additional services to meet the waiting list requirements. The goal of treatment for this condition has also progressed from removal of the tumour with or without the surrounding tissue, to offering surgery which may help to restore the patient's quality of life should they wish to consider this option (Reavey and McCarthy, 2008; Stavrou et al, 2009).

To meet this goal there have been significant enhanced oncological surgical developments, which have led to reconstructive options after mastectomy. However, with any surgical procedure there is the risk of delayed healing. In one review of the surgical technique of skin-sparing mastectomy, Sotharan and Rainsbury (2004) reported complications of skin envelope necrosis in 68% of cases, and haematoma formation in 46%.

Despite the added risk of tissue breakdown (Mortenson et al, 2004; Olsen et al, 2008), it is important that patients undergoing mastectomy have the option to preserve a normal breast form through breast reconstruction. Such surgery has been shown to have a positive effect on the psychological well-being of many women, and has contributed to an improvement in their quality of life (Reavey and McCarthy, 2008).

In 2008, the National Mastectomy and Breast Reconstruction Audit was

undertaken to review the provision of mastectomy and breast reconstruction services across England and Wales (NHS Information Centre, 2008). The key questions asked within the audit were:

- ▶▶ Is there uniformity in the provision of breast reconstruction services across England and Wales?
- ▶▶ Is sufficient information given to female patients undergoing mastectomy to enable them to make an informed decision as to whether to undergo reconstructive surgery, and are they happy with this decision?
- ▶▶ What are the outcomes of the mastectomy with or without reconstructive surgery?

The National Institute for Health and Clinical Excellence (NICE, 2002) suggest that the option for breast reconstruction should be offered to all patients where the clinical circumstances are appropriate, giving them time to make an informed choice. This can either be at the initial surgical procedure, or if this is not possible, they should be offered the option of delayed surgery. When interviewing patients as part of the National Mastectomy and Breast Reconstruction Audit (2008), the importance of timely, good quality information supported by photographs of the potential outcomes were identified. It was also recognised that the quality and quantity of information

could be improved. Some interviewees commented that the option for breast reconstruction had been offered in a 'discouraging way', and that they felt they were being manipulated at a vulnerable stage of their treatment.

Reavey and McCarthy (2008) reviewed the current options for breast reconstruction and described the two main classes of post-mastectomy reconstruction. For some patients both procedures are required.

### Prosthetic implant — base reconstruction

This can be a single stage reconstruction, where an implant is inserted following a skin-sparing or nipple-sparing mastectomy. Two-stage, expander/implant reconstruction is an alternative option, where the deflated tissue expander is placed in a submuscular pocket during the primary surgery process. Expansion of the device is performed at regular intervals until the breast is at the required size.

### Autologous tissue reconstruction

Wright et al (2007) describe this process which involves reconstructing the breast mound with autologous tissue from another part of the body. The most common autologous reconstruction is the transverse rectus abdominus myocutaneous flap, or, as it is more commonly known, the 'TRAM' flap. This involves using donor tissue (including skin, subcutaneous and *rectus abdominus* muscle) to reform the shape of a breast.

Other donor sites are available including the *lassimus dorsi* musculocutaneous flap. Due to the associated risk of morbidity with this process, Wright et al (2007) suggest that the procedure may be contraindicated where there is the risk of delayed healing because of pre-existing conditions such as diabetes, previous surgery, obesity and a history of extensive smoking — all of which may delay or inhibit the healing process.

While the option of breast reconstruction is important for the patient's well-being, the procedure is also associated with an increased risk

of wound complications. Hashemi et al (2004) identified these risks as haematoma, seroma, infection and flap necrosis, suggesting that the most frequent postoperative complication following breast cancer surgery is the development of seroma, particularly if the lymph glands in the axilla are removed at the same time.

### Implications for wound care

National Statistics Online (2009) show that the incidence of breast cancer is rising, although early detection programmes and improved treatment have meant that survival rates have also risen — with a five-year survival recorded for 81% of patients diagnosed between 1999–2003 in England.

Many clinicians with an interest in wound care are familiar with managing the palliative aspect of fungating wounds associated with breast cancer. However, they may be unaware of the opportunities to use their skills and knowledge to minimise complications and promote wound healing in patients undergoing breast reconstruction following mastectomy.

Within the Doncaster and Bassetlaw Foundation Trust, two breast care units run in unison covering an extensive demographic area. As with other large hospital trusts, there is a variation in the age range of patients and their individual expectations. There are patients who take an educated approach, who research their illness and are aware of the treatment options, while others accept whatever treatment is suggested, without questioning or requesting alternative options for care.

The publication of the national audit coincided with awareness by the wound care team at Doncaster and Bassetlaw Foundation Trust that an increased number of patients with tissue breakdown following reconstructive surgery were being referred. It was also observed that treatment with advanced wound care products was not always as successful as anticipated. An added concern was that many of these patients also required additional chemotherapy following mastectomy. This increased

the pressure for rapid wound closure, which is needed before this secondary treatment can begin.

While recognising this and noting the increase in referrals to the wound care service, the team identified the difficulties in healing wounds in this patient group, such as previous treatment with chemotherapy, possibly with associated neutropenia, and complications such as infection and tissue necrosis. As a result, they reviewed the treatment options, and considered what was currently available in order to improve the clinical outcome of the wound.

After discussion with the breast surgeon and having experienced success in treating other wound types (dehiscid surgical wounds, diabetic foot ulcers, trauma wounds) with negative pressure wound therapy (NPWT), the wound care team decided to use this treatment on a number of female patients who were referred to the wound care service with dehiscid mastectomy wounds, or problematic reconstructive incisions.

Within Doncaster and Bassetlaw NHS Foundation Trust, the NPWT device of choice is one where a gauze-based cavity filler is used. A soft silicone drain is placed in the wound in conjunction with saline-moistened gauze which is impregnated with polyhexamethylene biguanide (PHMB) (Kerlix AMD™, Covidien) using a technique first described by Chariker Jeter (Chariker et al, 1989). The drain is then connected to a fluid collection canister by a drainage tube, and the wound is sealed using a semi-adhesive permeable film dressing. The negative pressure exerted is usually between 60–80mmHg.

The following case reports not only demonstrate the challenge of healing these wounds, but also highlight how important it is for these patients to achieve wound closure after surgery for a life-threatening disease and a life-changing procedure.

### Case report one

This female patient was 42 years old, unmarried and with a demanding,



Figure 1. Breast wound at the initial assessment by the wound care service prior to treatment with NPWT.

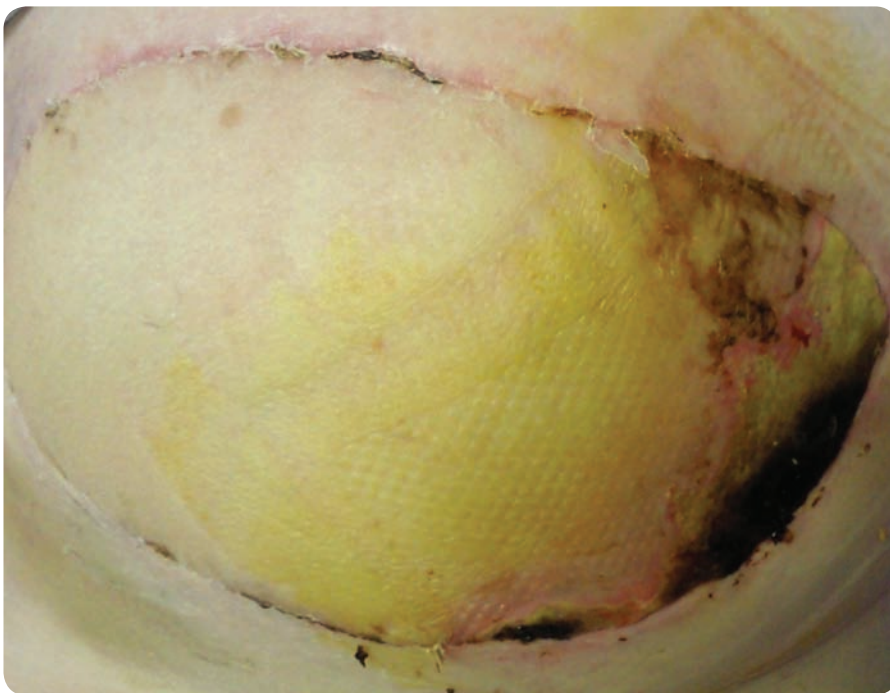


Figure 2. The breast wound one week after treatment with NPWT.

executive level job. Unfortunately, this successful career was put on hold as she was diagnosed with breast cancer and advised to undergo a mastectomy. After discussion with the breast surgeon she elected to have breast reconstruction. The most suitable option for her was the autologous tissue procedure, using an abdominal skin flap.

Although the initial surgery was successful, after several days a seroma

was observed on the suture line (Figure 1).

A seroma can develop following the collection of serous fluid under skin flaps during the surgical procedure of mastectomy, or following axillary node resection, where fluid collects in the dead space. First-line treatment is often a fine needle aspiration of the fluid, which is uncomfortable for the patient and may have to be repeated. However, as discussed earlier, further

complications can occur if the seroma becomes infected, which can lead to flap necrosis, wound dehiscence and an overall prolonged recovery time for the patient.

At the initial assessment by the wound care service specialist nurse, the wound was discoloured and leaking serous fluid profusely. The patient was finding it difficult to manage the wound with topical dressings and was worried about losing the skin flap.

The wound was being managed using absorptive dressings, although from observing the wound at this stage there was concern that this treatment would not prevent further tissue deterioration. It was suggested to the patient that by using NPWT, the fluid could be drained from below the scar-line, and this may improve the chances of healing and save the newly-formed breast.

Although this course of treatment may be more restrictive in the short term, a plan to manage the wound was agreed with the patient, whereby a channel drain was used along the scar line to prevent excess fluid from accumulating. The aim was to prevent exudate leakage, which was a potential risk for bacterial contamination and the development of secondary infection. The surrounding skin was protected using the silicone strips from within the dressing pack which contained the drain. The system was re-applied, and the patient was discharged with a plan to return to the ward for dressing changes.

A number of NPWT systems are available commercially. In this incidence the Venturi™ (Talley group) was used. The channel drain is designed to prevent tissue in-growth and can be applied directly to a wound or wrapped in the PHMB-impregnated gauze. Due to the fragile nature of the tissue of this patient, the drain was covered and laid along the upper scar line.

The patient was reviewed three days later. The wound area was visibly improving with healthy peri-wound skin forming, the exudate was being

controlled effectively and the peri-wound oedema was reducing.

At day six the pump was removed revealing a much healthier breast (Figure 2).

A small area on the wound still leaked a minimal amount of exudate, so as a protective measure a foam dressing impregnated with PHMB was applied (Kendall AMD Foam™, Covidien).

The patient continued this treatment regimen for four more weeks, changing the dressing weekly herself. She was seen twice during this time. However, because of the distance to the clinic (150 miles) and her wish to be independent, she discharged herself at the end of the fourth week. While this was against the advice of the wound care team, she gave reassurance that should the wound deteriorate she would contact her own local GP.

Wounds which present with minimal tissue damage and levels of exudate that pose no clinical problem, although they might be a nuisance to the patient, are not always considered for advanced therapies such as NPWT. However, the implications of losing the flap through infection and tissue necrosis would be devastating to the patient in this case report, and could have a profound impact on her physical and mental well-being.

With this treatment option the patient felt that by seeing the wound progress with minimal clinician intervention she was in control. She was able to continue to work, her confidence and self-esteem were restored and she considered that she was finally cured of cancer and could resume her career.

### Case report two

This active, 60-year-old female patient posed a different challenge. Following mastectomy and a subsequent course of chemotherapy, she had developed neutropenia. Six months following surgery she decided to have breast reconstruction. This was performed using abdominal tissue. The wound progressed to healing in all areas apart from the base of the flap (Figure 3).



Figure 3. Breast wound demonstrating the extent of the tissue breakdown.



Figure 4. Five weeks following treatment with NPWT, the wound has reduced in size and the granulation tissue looks much healthier.

On referral to the wound care service the patient presented with a large, heavily exuding wound with 100% granulation tissue but no epithelium present.

Due to the high level of exudate present and the impact that this was having on the patient's quality of life, together with the difficulty in maintaining a dressing in situ, it was decided that NPWT would be offered as a treatment option. A flat drain was used in conjunction with PHMB-impregnated gauze (Kerlix AMD™). This therapy was continued for five weeks (Figure 4).

At this point NPWT was no longer required, although the application of PHMB was maintained through an impregnated foam dressing (Kendall

AMD Foam™), and complete healing quickly followed. Treatment was carried out at twice-weekly outpatient visits over two months. This allowed the patient important time at home with her family, and gave her an opportunity to resume her active lifestyle

### Case report three

This female, 60-year-old patient took particular pride in her appearance. She had had breast reconstruction following a mastectomy which progressed so well that she requested surgery for a nipple formation. Unfortunately, this was not as successful and the wound deteriorated with necrotic areas becoming evident.

The necrosis was surgically debrided, but the wound continued



Figure 5: Breast wound showing the area of dehiscence following surgery for nipple formation.



Figure 6. The breast wound with the channel drain in situ on the wound bed, held in place with adhesive strips from the consumables pack.

to exude copious amounts of fluid (Figure 5). There were concerns that the wound would deteriorate to the extent that the cosmetic effects of the reconstructive surgery would be

reversed. In an attempt to manage the exudate, protect the newly-formed breast tissue and encourage healing, NPWT was introduced into the wound (Figure 6).

After five weeks of treatment with NPWT using the VISTA™ system (Smith and Nephew), the exudate was controlled and the wound was fully granulated (Figure 7). The therapy was discontinued and the wound was protected using a non-antimicrobial dressing. However, at assessment two weeks later, there was no further improvement to the wound and some malodour was recorded.

PHMB-impregnated foam (Kendall AMD Foam™) was applied and epithelialisation quickly occurred. Full healing was achieved three weeks later (Figure 8).

### Summary

Undergoing surgery for breast cancer with or without reconstruction can be devastating for many women who hope and anticipate that this is the end of treatment for this disease. While the risks of tissue breakdown are well-documented, this additional complication is unexpected and unacceptable to many patients.

For the three cases discussed in this paper, treatment with gauze-based NPWT devices was successful within a relatively short period of time. The patients were treated as outpatients and were able to observe measurable improvements in their wounds, which enhanced their well-being and improved their quality of life. **WUK**

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Figure 7. NPWT in situ over the breast wound.



Figure 8. Breast wound before discharge from the wound care service.

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### Key points

- ▶▶ Breast reconstruction is an option for many women following mastectomy for breast cancer.
- ▶▶ Breast reconstruction techniques are associated with added risks of tissue breakdown.
- ▶▶ The use of negative pressure wound therapy (NPWT) can contribute to effective exudate management and positive healing outcomes.
- ▶▶ The impact of tissue breakdown and uncontrolled exudate management following breast reconstruction can have a profound impact on the quality of life for many women after mastectomy for cancer.

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