The Palliative Management of Fungating Malignant Wounds

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Introduction

Fungating wound management is an under researched topic. The literature that informs the clinical management of these wounds is therefore derived from a number of disciplines such as oncology, chronic wound care and palliative care. The information presented in this paper also includes the clinical and research experiences of the author. A critical approach is adopted and topics for future research are identified because there are significant unsolved problems in the management of fungating wounds. The key areas addressed include the aetiology of fungating wounds, and the physical and psychosocial impact of an uncontrolled fungating tumour. Novel approaches to the management of intractable symptoms are described and local wound management is discussed.

Aetiology

Fungating malignant wounds are caused by tumour infiltration of the skin and its supporting blood and lymph vessels. The tumours may be locally advanced, metastatic or recurrent. In addition some patients, for their own sad reasons, hide their disease and present with established fungation.

Unless the tumours are treated by single or combination anti-cancer treatments the fungation extends. There is the potential for massive damage to the skin through a combination of proliferative growth, loss of vascularity and ulceration. The loss of vascularity is a major source of the problems associated with these wounds because of the loss of tissue viability and consequent necrosis (Mortimer 1998). Anaerobic and aerobic bacteria proliferate in these conditions and are probably the sources of the malodour and exudate that are commonly associated with these wounds (Rotimi and Durosinmietti 1984;Thomas and Hay 1991).

The incidence of fungating wounds is not recorded in population-based cancer registries and is unknown. The duration of the disease may be years, if it is localised. The significance of fungating wounds can therefore be judged in terms of the impact on the individual, the family and health service resources of an uncontrolled fungating tumour over a

potentially lengthy period. The impact may amount to a loss of self on the part of the individual patient and gradual separation from family and friends attributable to revulsion to uncontrolled body fluids (Lawton 2000).

The impact of an uncontrolled fungating tumour

The skin is recognised as the largest organ of the body. The assault on the individual, both physically and psychologically, of uncontrolled tumour infiltration is overwhelming. Any tumour can result in a fungating wound and tumour progression through the skin follows diverse patterns (Grocott 1999;Grocott 2000a). Fungating breast cancer presents in a number of ways, for example deep necrotic ulceration with proliferative growth of the ulcer margins or extensive cutaneous infiltration of the chest wall. Carcinomas of the ovary, caecum and rectum, which infiltrate the anterior wall of the abdomen, may present initially as small raised nodules which develop into necrotic 'cauliflower - like' structures. Carcinomas of the rectum and genito-urinary tract can cause protruding perineal growths, gross deformity and loss of normal function, which may include fistulae involving the bladder, vagina and bowel. Head and neck tumours not only distort the face but may communicate with the buccal cavity necessitating tube feeding, for example via a gastrostomy tube. In addition, extensive areas of the skin may be infiltrated when tumours such as cutaneous T cell lymphoma and malignant melanoma are resistant to treatment. The diversity in the presentation of fungating tumours may not be surprising given the anatomy of the skin and the known routes for loco-regional spread and metastases. The utility of this information is that it provides insight and some ability to predict and plan for clinical needs.

Given the loss and disruption to normal function of large areas of the skin, the physical, let alone the psychological support required to meet patients' needs is significant. The location of the tumour is critical to the impact on the patient, the approaches to symptom control and local wound management. Fungating wounds on the head and neck, the breast or the perineum for example are associated with particular physical and psychosocial problems.

Related symptoms may also increase morbidity and the management problems. These include: pain and loss of function from the pressure of the tumour on surrounding structures, cutaneous pain and irritation, recurrent infection, and swelling as a consequence of impaired capillary and lymphatic drainage. Patients with fungating breast disease for example, may be severely disabled by the pain and immobility of brachial nerve plexopathy and adjacent limb lymphoedema.

Unless fungating wounds are contained under wound dressings, the patient's life is taken over by leakage of exudate, soiling, dressing changes and laundry. The suffering associated with altered body image, loss of dignity and independence can be immense. In addition, family bereavement can be protracted if life has revolved around the visual impact of cancer and dressing changes. The management of fungating wounds requires commitment in

terms of staying power on the part of the interdisciplinary team and resource provision, wound dressings in particular.

Management

As with any wound the underlying cause of the wound, the tumour in this instance, needs to be diagnosed and treated. If the tumour is sensitive to treatments, such as radiotherapy or chemotherapy, significant reduction in tumour size and healing can be achieved. Unfortunately tumour recurrence with fungation is not uncommon and the patients, families and clinicians have to face this recurrence, and all the problems of living with and managing the fungating tumour, over again. Fungating tumours present an enormous challenge to clinicians. Symptom control measures, both local and systemic, together with wound dressings are the mainstays of management once curative treatment has been exhausted. In addition patient care may include stoma management and artificial forms of feeding. A broad range of skills is therefore needed to manage the complex problems that arise when tumours are uncontrolled. With the involvement of appropriate specialists symptom control and wound dressings can significantly relieve the physical and psychosocial problems, and therefore the overall impact of the fungating wound. There are however limitations in the performance of dressing systems that are currently available which need to be addressed so that clinicians can meet the patients' needs. These limitations will be discussed in the section on local wound management in this paper.

Assessment and Evaluation

Assessment, documentation and evaluation are key components of the clinical role in any aspect of patient care. An assessment tool, using the TELER™ system of treatment evaluation, was developed for the multiple-case study (Le Roux 1985; Grocott 1998; 1999). The system comprises a system of clinical note-taking and indicators of dressing performance and optimal wound management. The indicators define patient-centred goals of care in relation to a fungating wound and measure the outcomes. The tool may be used under a licence agreement to TELER Limited.

Symptom Control Measures

It is beyond the scope of this paper to give details of the wide range of symptom control measures to assist the overall management of fungating disease. The key issue here is that the management of fungating tumours is complex and requires an interdisciplinary approach. The patients need to be referred particularly to palliative care teams who have specialist knowledge and expertise in the art and science of symptom control. The symptom control measures that are outlined below include novel approaches to the management of intractable symptoms, used during the author's study, which merit further research.

The major problems arising from the fungating wound that require symptom management include: pain, soreness and irritation from excoriated skin conditions, pruritis, odour, spontaneous bleeding and haemorrhage. These problems may be interrelated, for example infection with organisms such as *Staphylococcus aureus* and *Pseudomonas* can cause pain, odour, bleeding and rapid extension of the wound (Cooper and Molan 1999). The differential diagnosis of the problem, from accelerated tumour infiltration, may not be straightforward. If in doubt involvement of appropriate members of the interdisciplinary team to reach an accurate diagnosis and treatment plan, in this instance a consultant microbiologist and oncologist, is crucial.

Pain

The management of pain requires identification of the receptors responsible for the pain so that the appropriate analgesia may be prescribed. Accurate assessment is therefore vital (Naylor 2001). It is particularly important to distinguish between pain caused by the stimulation of nerve endings (nociceptive pain) and pain caused by nerve dysfunction (neuropathic pain) because different treatments may be indicated (Twycross 1997). Topical opiates are increasingly being used to palliate nociceptive pain and stinging from damaged and ulcerated skin (Back and Finlay 1995; Krajnik and Zylicz 1997; Krajnik, Zylicz *et al*. 1999).

In the author's study topical diamorphine was used to control intense stinging from the tumour infiltration of the chest wall (Grocott 1999; 2000b). Diamorphine was prescribed according to the normal protocols and prepared for topical application by the district nurses. The drug was dissolved in a small quantity of water for injections and mixed with a hydrogel (Intrasite gel – Smith and Nephew Ltd) using a sterile galley pot and gloved finger, and spread thinly over the damaged skin. The dose of diamorphine was titrated until optimum control of stinging was achieved. The final dose for this participant was 20mgs of diamorphine in 30 gms of hydrogel twice daily. Her systemic dose of opiates was subsequently reduced. The findings from a single case such as this need to be treated carefully and not transferred directly to another patient with painful lesions before an accurate diagnosis of the individual's problem is made. There is increasing theoretical understanding of opiate sensitive pain (Hanks and Cherney 1998). This theoretical understanding together with the appropriate treatment can be transferred, or generalised, from one patient to another as opposed to a direct transfer of treatments between patients with no theoretical explanation of why this may be appropriate (Grocott and Cowley 2001).

Soreness and irritation from macerated and excoriated skin conditions

Exudate and body fluids that are in sustained contact with the skin cause predictable and inevitable damage to the skin with consequent inflammation and pruritis. Patients with perineal fungating tumours suffer particularly in this respect. Until recently topical creams and anaesthetic gels had limited effect on preventing or treating these particularly distressing and intractable problems for two key reasons. First, the preparations did not form a barrier for the skin that

withstood the constant flow of exudate or effluent from the fungating lesions. Secondly, the anaesthetic preparations contained alcohol and were associated with intense stinging on application. The experiences of a novel local anaesthetic gel (Lutrol with lignocaine) and recent commercially available alcohol-free barrier products (e.g. 3M Cavilon) are that they can help to heal macerated skin conditions and reduce the unpleasant symptoms because they form a sustained barrier against the effects of fluids on the skin (Macgregor et al. 1994;Grocott 1999).

Cutaneous irritation

The irritation referred to here is a creeping, intense itching sensation attributed to the activity of the tumour, particularly in inflammatory breast disease and cutaneous infiltration (Regnard and Tempest 1998). It is generally not responsive to antihistamines. In addition to reducing the fungation active treatments such as hormone therapy or palliative chemotherapy can reduce this form of irritation. Tumour resistance and unacceptable side effects can however limit such treatments.

Significant relief from the intensity, not the duration, of irritation was achieved with the use of TENS (Transcutaneous Electrical Nerve Stimulation) in the same patient described above in relation to topical diamorphine. The irritation was not relieved by topical diamorphine or by other drugs such as antihistamines. The massive destruction of the skin, including damage to the peripheral nerve supply, may explain that the cutaneous stinging and irritation suffered by this patient were components, nociceptive and neurogenic, of an aggressive pain syndrome that was partially relieved by TENS. The application of TENS is worked out on a dermatomal basis and involves a degree of trial and error. It is therefore important to involve experts in the administration of this treatment and not to raise patients' expectations excessively. There are a number of forms of electrical treatment. The choice of treatment and citing of electrodes on dermatomes away from broken and unhealthy skin are crucial to the success and safety of this approach to symptom relief (Thompson and Filtshie 1998). Given the intractable nature of cutaneous irritation and the advantages of a non-pharmacological approach, the use of TENS for the management of this form of cutaneous irritation deserves further research attention.

Odour

Three main approaches are adopted for the management of odour: systemic antibiotics, topical metronidazole and charcoal dressings. In addition attempts are made to reduce dead tissue to improve the performance of anti-bacterials, or obviate their need. There are however limitations to these approaches largely attributable to the size and eccentric shape of the wounds, the liquefaction of dead tissue and the management of consequent exudate.

Systemic antibiotics are used as presumptive measures to reduce bacterial colonisation and control the offensive odour from volatile metabolic end-products. The attribution of odour to these metabolic end-products has been questioned (Hampson 1996). However a broad causal

relationship between certain bacterial species, necrotic tissue and odour is generally accepted (Rotimi and Durosinmietti 1984). One of the limitations of systemic antibiotics is the increasing incidence of antibiotic resistance (Dunford et al. 2000). A further limitation is their acceptability to the patients which is probably limited by gastric side effects. The palliative care texts suggest that side effects may be avoided at low doses without losing the therapeutic effect on the odour (Twycross et al 1998).

Topical metronidazole may overcome the limitations of the systemic route (Newman, Allwood et al. 1989; Thomas 1992; Thomas and Hay 1991). However, in extensive necrotic wounds sufficient inhibitory concentration of metronidazole to deodorise may not be reached. The problems centre on the size of the wounds and a lack of tissue penetration to bacteria located below the surface. In addition the site of the wound, for example the perineum, may limit the efficacy of the topical gel, which is lost to the absorbent dressings and pads. Practical options for topical applications, including dosage, for the size and shape of the wound all need to be demonstrated through further research.

Clearance of dead tissue by surgical debridement is generally not an option for fungating wounds because of the bleeding potential. Autolytic debridement with topical hydrating materials may be appropriate, but the clinical gains need to be assessed critically. For example, the patients with extensive wounds covered with eschar may not benefit from debridement if life expectancy is short and the consequent exudate profuse.

Limitations of the hydrating systems, the hydrogels for example, are again attributable to the size of the wounds and the practicalities of applying a therapeutic amount of hydrogel without adding to existing exudate management problems. In the author's study novel preparations, for example Manuka honey and the krill enzymes, debrided the lesions and reduced odour significantly. These findings for the performance of manuka honey are similar to the case study findings of Dunford et al (2000). Kingsley's (2001) reported similar findings for the reduction of odour. However the two case studies also illustrate those patients with chronic wounds who have complex patterns of bacterial colonisation and clinical infection that may not be resolved by the topical application of honey.

Honey and enzymatic debriding agents are forms of autolytic debridement, which inevitably increase exudate as the devitalised tissue is liquefied and separated from the wound bed. This exudate has to be contained with wound dressings otherwise the patients experience a further unpleasant problem or the aggravation of an existing problem (Westerhof 1993; Cooper and Molan 1999; Grocott 1999). The management of exudate is discussed further in relation to local wound management. In addition

Activated charcoal dressings act as filters to absorb the volatile malodorous chemicals from the wound, before they pass into the air (Thomas et al. 1998). Charcoal dressings are useless however when the dressings cannot be fitted as a sealed unit. The volatile malodorous chemicals simply escape into the air (Grocott 1998;Thomas et al. 1998). Air tight charcoal garments may

overcome this limitation when the wounds are extensive or cited in body curves which are difficult to dress (Suarez et al. 1998). One of the commercially available charcoal dressings is impregnated silver and claims are made that the dressing has bacteriostatic properties in addition to adsorbing odour-forming molecules (Actisorb Plus – Johnson & Johnson Ltd). The limitations of this dressing include the mismatch between the size and shape of the dressing and the size and shape of fungating lesions. The dressing is a primary wound contact layer and adherence to fungating wounds has also been observed (Grocott 1999).

Bleeding

Oral antifibrinolytics, radiotherapy and embolisation are used to control spontaneous bleeding from eroding blood vessels. It is therefore important to maintain open lines of communication with an oncology centre so that a rapid referral for emergency control of bleeding can be made easily. Topical measures such as adrenaline 1:1000 are also applied as an emergency measure (Hoy 1993; Twycross 1997; Dunlop 1998; Regnard and Tempest 1998). However, the vasoconstrictive effects of adrenaline are associated with ischaemic necrosis if it is used liberally. Surgical haemostatic sponges (e.g. Spongostan – Johnson& Johnson Ltd) are alternative, practical emergency measures for controlling fast capillary bleeding though they appear expensive on a unit cost basis and are not available of the *Drug Tariff*. Sucralfate suspension is advocated by palliative care specialists as a cost effective alternative, who also recommend that its performance should be evaluated in a research study (Regnard and Tempest 1998).

Attention to the following can reduce the incidence of bleeding at the dressing changes: dressing application and removal techniques, maintenance of humidity at the wound/dressing interface, cleaning techniques and the use of non-fibrous materials. An anomaly in the performance of fibrous alginates, promoted as haemostatic dressings, was found in the author's study for the friable fungating wounds. The capillaries were visible to the naked eye on the surface of these wounds and mechanical damage and bleeding was repeatedly observed with the use of fibrous materials (Grocott 1999). Alternative nonadherent systems include Mepitel with a simple pad or Mesorb (Molnlycke Healthcare Ltd) or Novogel (Ford Medical).

Local wound management

Local wound management approaches are linked to the location, size and shape of the wounds, not to cancer aetiology. A key pivotal problem found in the author's study was the management of exudate (Grocott 1998, 2000c). Current practice in wound care, including the manufacturing focus for wound dressings, is based on Winter's (1962) theory of moist wound healing (MWHT). However, MWHT explains the profound influence on epithelialisation of restricting the evaporation of water from the wound surface (Winter 1962; Winter 1965). It does not explain exudate management in chronic wounds, such as fungating wounds (Grocott 1998;Grocott 1999;Grocott 2000c). Without control of exudate the physical and psychosocial

impact of these wounds are compounded by leakage, soiling, frequent dressing changes or re-padding, peri-wound maceration and odour. In the author's study effective control of exudate substantially resolved the wound management problems, the patients regained a degree of independence and control over their daily lives and had less need of the health services (Grocott 1999).

The current reliance on the absorptive capacity of a dressing is not an efficient method of managing heavy exudate, particularly when there are inevitable problems fitting dressings to extensive, eccentrically shaped wounds and curved body surfaces. The use of simple gauze products with a high venting capacity is not the answer to exudate management for two key reasons. First, gauze does not provide a moist interface between the wound and the dressing, even in a heavily exuding wound. A degree of controlled moisture conservation at the interface between the wound and the dressing is essential to prevent adherence and trauma. Secondly simple gauze products allow 'strike-through' of exudate as there is no waterproof backing. There is a gap in the provision of wound dressings for exudate management that needs to be filled if the needs of patients with exuding fungating wounds are to be met effectively. Systems are required which are built up of membranes with the following three functions:

1) conservation of surface humidity and moisture to prevent adherence and trauma;
2) reservoir capacity for exudate that is excess to the purpose of (1);
3) high moisture vapour transfer through the back surface of the dressing to vent excess fluid and manage overload of exudate production.

The systems depend crucially on the fit of the dressing to the size and site of the wound, fast uptake of exudate, absorbency and fluid venting capacity. Dressings need to be presented in metre rolls to accommodate large wounds, as performance is compromised when several small sizes are overlapped. The choice of adhesives and the configuration of the adhesive on films and tapes are also critical to prevent skin stripping (Grocott 1998). Two options are identified below to control heavy exudate based on the above three functions. The first is made up of dressings that are currently available on the *Drug Tariff*. The second requires dressings that were evaluated in the author's study but are not readily available in the UK at the time of writing.

Two layer permeable system

The first option relies on the two layer system with dressings secured by non adhesive retention products (e.g. tubular bandages). The principles underpinning the system are that a perforated nonadherent layer (e.g. Mepitel /Meplilex Transfer by Mölnlycke Healthcare Ltd) protects the wound surface and permits passage of exudate to an absorbent and permeable layer (e.g. Mesorb by Mölnlycke Healthcare Ltd, or a simple dressing pad). In the circumstances of

heavy exudate a pad such as Mesorb is needed to hold the exudate in a 'fluid lock-in' system. Excess moisture is vented through the back surface of the dressing. The retention garment holds the dressings in place without the need for adhesive products.

Two layer system with controlled permeability

The principles underpinning the second option is that the primary wound contact layer (e.g. Meplilex Transfer by Mölnlycke Healthcare Ltd) is in precise contact with the exuding wound surfaces, is highly absorptive, transfers excess exudate to the secondary retention layer which has a high moisture vapour transfer rate to vent the excess fluid (HMVTR > 10,000 g/m^2/24 hours). This system has advantages over the two layer permeable system. It manages heavy exudate. If leakage occurs it is in sites such as the groin, the pubic region and the axilla. The system is non bulky and may be more cosmetically acceptable to the patients. It can be fitted to the head and neck wounds. However, specific design work is needed to develop applications for head and neck wounds to avoid the fiddling and experimentation on the patients that is difficult to avoid, to fit dressings to these sites.

Materials with levels of moisture vapour transfer above 1,000 – 1,2000 g/m^2/24 hours are not readily available in the UK currently. However there is a logical place for high venting capacity materials in the portfolio of wound dressings, described in the author's study as eight dressing systems - see Table 1 (Grocott 1999; 2001). Systems one to seven comprise materials that are fully permeable, occlusive, semi-occlusive and semi-permeable. System eight comprises the incontinence products for patients with perineal wounds.

The two layer system can be extended into a three layer system if the wound comprises a cavity wound that requires a cavity dressing such as a fibrous alginate or methylcellulose dressing.

Table 1 Dressing Systems

- System one, two layer non adherent (N-A) primary contact layer, permeable gauze and fixation materials
- System two, two layer fibrous alginate, permeable gauze and fixation materials
- System three, vapour permeable foam dressings
- System four, occlusive hydrocolloid, glycerine gel sheets (Novogel – Ford Medical)
- System five, two layer hydrogels and high moisture vapour transport (HMVTR) film
- System six, three-layer N-A primary contact layer, gauze and HMVTR film
- System seven, two layer fibrous (soft), non fibrous (hard) alginate or hydrofibre materials and HMVTR film
- System eight, incontinence products with fluid 'lock in' systems

Conclusions

Fungating wound management is an interdisciplinary responsibility. No single clinician can be expected to have all the skills needed to manage patients with such complex disease.

However there is a range of practitioners who can contribute specific knowledge, skills and experience to problem-solve for the patients. Without successful treatment of the underlying tumour the management of these wounds comprises symptom control measures and local wound management with dressings. Both are crucial to the physical and psychological care of the patients and families. At present there are significant limitations in the application of dressings to fungating lesions, particularly in relation to exudate management, that need to be addressed.

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