An overview of managing hypergranulation in wounds

Annemarie Brown

Hypergranulation can occur in many types of wound and its appearance may be distressing for the patient and difficult for healthcare professionals to manage, as it has the potential to impede normal wound healing. Although the exact cause is not understood, different types of hypergranulation can be differentiated by carrying out a thorough patient and wound history and clinical examination, with further investigations where necessary. This article gives an overview of the three different types of hypergranulation and their potential causes, provides practical advice about how each type might be managed to promote effective wound healing, and explains why treatment is sometimes not needed because it may resolve spontaneously.

KEYWORDS:
- Hypergranulation
- Inflammation care
- Infection
- Wound healing

Granulation tissue formation is an important proliferative phase of wound healing and generally occurs uneventfully. However, occasionally, excessive tissue forms, the reason for which is not yet fully understood (Jaeger et al, 2016). Hypergranulation, which is also referred to as overgranulation or ‘proud flesh’, can occur in most wound types (Jaeger et al, 2016). This protruding, red, friable and shiny tissue is unsightly, distressing to patients, challenging for healthcare professionals and has the potential to inhibit wound closure because it can be a barrier to prevent epithelial cells migrating across the wound surface in the final phases of healing (Vuolo, 2010; McGrath, 2011; Jaeger et al, 2016).

Suggested predisposing risk factors for hypergranulation include wounds that heal by secondary intention because they undergo a lengthy healing process (Wang and Goldberg, 2007), excessive moisture at the wound bed (Harris and Rolstad, 1994), a prolonged inflammatory phase caused by infection or high levels of bacteria (McGrath, 2011), or a persistent irritant to the wound. This can be seen commonly in patients with suprapubic catheters, gastrostomy tubes or stoma wounds, where frequent rubbing of the tube against the skin creates a persistent inflammatory response (Vuolo, 2010; McGrath, 2011).

The use of occlusive dressings, such as hydrocolloid dressings, may potentially cause hypergranulation. These maintain low oxygen levels and high volumes of moisture at the wound surface, which stimulates the growth of granulation tissue in response to hypoxia in the wound (Widgerow and Leak, 2010). The capillaries formed by this granulation tissue may be immature and absorb excessive moisture, which cannot evaporate through the occlusive dressings (Hampton, 2007).

Another suggested cause of hypergranulation is an imbalance of matrix metalloproteinases (MMPs) in the proliferative phase of wound healing (Vuolo, 2010). These enzymes are responsible for degrading proteins during this phase and they regulate and maintain the balance between normal collagen formation and reabsorption of the extracellular matrix, the temporary wound filler (Vuolo, 2010). In normal wounds, the rate of collagen production is greater than the destruction or lysis of the extracellular matrix (McGrath, 2011). As a result of this molecular imbalance, the amount of collagen produced is not controlled and this results in overgranulation.

MANAGEMENT OF HYPERGRANULATION

Vuolo (2010) distinguishes between three different types of hypergranulation (1, 2 and 3). Each type of hypergranulation can be differentiated by taking a comprehensive patient and wound history, carrying out a thorough clinical examination, and requesting further investigations. These may include biopsies, if necessary, to rule out potential malignancy, which can present clinically as hypergranulation (Vuolo, 2010). If a malignancy is suspected, further advice should be sought urgently from a dermatologist or other specialist.

Vuolo (2010) has produced a simple and user-friendly algorithm for the treatment of all types of hypergranulation. The three components of the algorithm, types 1, 2 and 3, are discussed in detail below.

TYPE 1 HYPERGRANULATION

Type 1 hypergranulation may be a result of inflammation and possible high bacterial burden, critical colonisation or subclinical wound infection (McGrath, 2011). Clinically, possible signs of type 1 hypergranulation include high exudate volume, malodour, abdominal wound bed colour, cellulitis, bleeding and delayed healing (Vuolo, 2010).

The treatment of choice for type 1 hypergranulation would be topical antimicrobial agents, and healthcare professionals are advised to consult

Red Flag

Malignancy may have a similar appearance to hypergranulation, so further advice should be sought urgently from a dermatologist or other specialist if suspected.
their local trust guidelines or formulary on which products to use. The World Union of Wound Healing Societies (WUWHS, 2010) recommends products such as povidone-iodine, cadexomer-iodine, silver or honey-based products to treat type 1 hypergranulation. They advise that these products are used for a limited period only, for example 10–14 days, and then the wound should be reassessed. If no improvement is noted, their use should be discontinued because they are expensive and tend to be over- or inappropriately used (WUWHS, 2010). However, if some positive response is observed and the hypergranulation is gradually reducing, their continued use can be justified for a further two weeks (Jaeger et al, 2016).

If systemic infection is suspected, local trust protocols for the use of systemic antibiotics should be consulted. In this case, the hypergranulation can be managed using both topical antimicrobials and systemic antibiotics, with a suitable secondary dressing, such as polyurethane foam, but not an occlusive dressing.

If the hypergranulation fails to respond to the above treatment, topical steroids should be considered because they dampen down the inflammatory response and reduce hypergranulation as a result of the skin-thinning properties of corticosteroids (Vuolo, 2010). In clinical practice, eye drops or ointments, such as Maxidex® (Novartis Pharmaceuticals), which contain dexamethasone 1mg per 1ml (BMJ Group, Royal Pharmaceutical Society of Great Britain, 2015–16) or Maxitrol® (Novartis Pharmaceuticals) eyedrops or ointment (which contain dexamethasone 1mg per 1ml, neomycin sulphate 3500 units per 1g and polymyxin sulphate 6000 units per 1g) are often used. However, healthcare professionals need to be aware that these have the potential to impede healing and may be contraindicated for use on open wounds (Young, 1995). The use of these products on open wounds is ‘off licence’ and practitioners should consult the manufacturer before use.

A corticosteroid-based product which is suitable for use on hypergranulation in wounds is Haelan® tape, which is a waterproof, self-adhesive polythene tape impregnated with 4ug/cm² fludrocortisone, a moderate-potency corticosteroid (BMJ Group, Royal Pharmaceutical Society of Great Britain, 2015–16). The tape is cut to ensure it is 5mm larger than the wound and multiple strips can be used to cover the entire area if necessary (McGrath, 2011). The treatment area needs to be clean and the surrounding skin dry. The tape can stay in situ for 12–24 hours or longer, depending on clinical conditions (McGrath, 2011). There are also ointment and cream versions available that are often used to reduce hypergranulation, however, they will add additional moisture to the wound bed, which may not be desirable. An advantage of using the tape is that it can be cut to fit the exact shape of the wound or for devices, such as catheter tubes and stomas (McGrath, 2011). Initial application should be for one week only, with regular reviews thereafter and once the hypergranulation has resolved, or irritation or infection develops, it should be discontinued because it is not designed for long-term use.

Historically, caustic products, such as silver nitrate sticks, were used to...
reduce hypergranulation by burning the tissue. However, these have several disadvantages, such as damage to the periwound area, increased pain, potential tissue necrosis and infection, and they can cause systemic problems if used over a wide area (Rollins, 2000; Dealey, 2005; Jaeger et al, 2016). These products are therefore no longer recommended and tend to be used only as a last resort when all other treatment options have been tried and failed (Hampton, 2007).

Other causes of type 1 hypergranulation are persistent irritation and/or a reaction to foreign bodies in the wound. Foreign bodies, such as cotton wool, lint fibres or dressing residue, or an embedded suture, will result in a prolonged inflammatory phase as the body perceives this as a potential threat to skin integrity (McGrath, 2011). This is one of the reasons that these products are no longer recommended for wound cleansing.

**TYPE 2 HYPERGRANULATION**

Type 2 hypergranulation is often the easiest type of hypergranulation to treat because it usually forms as a result of prolonged occlusive dressing use. Widgerow and Leak (2010) suggest that granulation tissue growth is enhanced with dressings, such as occlusive dressings, that support a low oxygen, high moisture environment. If hypergranulation develops, occlusive dressings should therefore be replaced with more permeable dressings, such as foam dressings, which have a high moisture vapour transmission rate (MVTR) and improve gaseous exchange and increase vapour loss at the wound surface (Vuolo, 2010).

It may also be beneficial to apply a little pressure to the wound bed to push the granulation tissue back into it by cutting a small piece of a non-adhesive foam dressing to fit the wound and applying a further foam dressing over the top. Vuolo (2010) also suggests that the application of wound pads or crepe bandages over the hypergranulation may increase the pressure; however, it is important that the blood supply is not compromised. Healthcare professionals need to observe the wound and the surrounding skin for signs of swelling, blueish discoloration, or a reduction in temperature in the digits or limbs where the wound is sited.

**KEY POINTS**

- Hypergranulation can occur in most wound types and has the potential to inhibit wound closure.
- Possible risk factors include wounds that heal by secondary intention, excessive moisture at the wound bed, infection or a persistent irritant to the wound.
- Three different types of hypergranulation (1, 2 and 3) can be differentiated by taking a comprehensive patient and wound history, carrying out a thorough clinical examination, and requesting further investigations.
- Each type of hypergranulation may be treated differently according to the suspected cause and presenting symptoms.

**REFERENCES**

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