

# Haelan Tape for the treatment of overgranulation tissue

Overgranulation tissue usually presents in wounds healing by secondary intention and is clinically recognised by its friable red appearance. Its presence in a wound inhibits epithelialisation. Historically the treatment of overgranulation tissue consisted of destruction of the overgranulation tissue by cauterisation, curettage, silver nitrate, steroid preparations or application of pressure (Semchyshyn, 2005). Haelan Tape contains a moderately potent steroid and is used for a variety of inflammatory conditions in dermatology. It has been found to be useful in treating overgranulation, particularly around stoma sites.

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## KEY WORDS

Secondary intention  
Wound healing  
Overgranulation tissue  
Topical steroids  
Haelan Tape

Granulation tissue is a transitional replacement for normal dermis, which eventually matures into a scar during the remodelling phase of healing. It is characterised from unwounded dermis by its extremely dense network of blood vessels and capillaries, elevated cellular density of fibroblasts and macrophages and randomly organised collagen fibres (Ovington and Schultz, 2004). Healthy granulation tissue is pinky-red in colour, moist and shiny and does not bleed easily (Dowsett, 2002) (Figure 1).

Wounds left to heal by secondary intention, especially cavity wounds, require a greater degree of granulation tissue to fill the wound defect. Re-epithelialisation of the wound will not take place until the defect is filled with granulation tissue level with the surrounding healthy skin (Dowsett, 2002).

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In some cases, it is possible for the granulation tissue to continue forming within the wound even after it has drawn level with the surrounding healthy skin. This is known as overgranulation, hypergranulation, exuberant granulation tissue, proud flesh, hyperplasia of granulation and hypertrophic granulation (Dealey, 1999; Dunford, 1999).

Overgranulation tissue can be classed as healthy or unhealthy. Unhealthy tissue presents as either a dark red or a pale bluish/purple uneven mass rising above the level of the surrounding skin (Harris and Rolstad, 1994). It may be dehydrated with a dull surface and it bleeds easily. It is also quite friable and easy to break. The presence of such tissue, as well as increasing the patient's risk of infection, prevents or slows epithelial migration across the wound and thus delays wound healing (Dealey, 1999; Dunford, 1999; Collins et al, 2002). Malodour and exudate are also common as infection is usually instrumental in the formation of unhealthy overgranulation tissue.



Figure 1. Granulation tissue.

The clear or yellow fluid produced by the overgranulation tissue can cause maceration of the surrounding tissues and occasionally skin stripping which can also complicate wound healing (Borkowski, 2005).

Healthy overgranulation tissue presents as an overgrowth of pinky-red, bleeding, 'cauliflower-like', moist tissue (Griffiths et al, 2001). A possible explanation for the origin of overgranulation tissue can be found in the framework of the biology of the healing wound. Fast growing granulation tissue contains immature capillaries that tend to leak causing the interstitial tissues to become oversaturated with fluid. Overgranulation tissue is commonly found in wounds treated with occlusive dressings (Vandeputte and Hoekstra, 2006). This is most probably due to the dressing becoming saturated, insufficient drainage of the wound environment and increasing oedema of the surrounding tissues (Hampton, 2006). It is also suggested that the cause of hypergranulation is closely linked with a prolonged inflammatory response (Dealey, 1999).

Another possible explanation is the overgrowth of fibroblasts and endothelial cells. These highly vascular lesions resemble pyogenic granuloma on histological analysis. The presence of this tissue results in the inhibition of fibroblast proliferation and prevents wound healing (Semchyshyn, 2005).

With time, overgranulation may resolve itself but most clinicians feel the need to remove it. Clinical judgement is required for the management of each individual patient. Although there is very little in the literature regarding the management of hypergranulation tissue, the fact that there are numerous treatments used by various wound clinicians demonstrates that its presence is recognised as a clinical problem (Harris and Rolstad, 1994).

### Treatment of overgranulation

Treatment consists of destruction of the hypergranulation tissue by cautery, shave excision, silver nitrate, application of pressure, aluminium chloride, or curettage (Semchyshyn, 2005). Currently, the most commonly used treatments are silver nitrate foams and corticosteroids.

#### Silver nitrate

The use of silver nitrate is a traditional practice which directly reduces fibroblast proliferation. It has been used for the treatment of ulcers and hypergranulation tissue since 1829 (Nguyen et al, 1999) although good evidence for its use is lacking. Indeed, silver nitrate is known to be caustic and is not recommended for prolonged or excessive use (Dealey, 1999).

Silver nitrate is available as a caustic 'pencil' which is an applicator stick with a tip consisting of 95% silver nitrate and 5% potassium nitrate. The pencil is inexpensive, easily available and application requires minimal technical skill. The silver nitrate works by acting as a strong oxidising agent. In aqueous solution, the silver cation of this salt,  $\text{Ag}^+$  (Rollins, 2000), is readily reduced to neutral silver metal,  $\text{Ag}^0$ , resulting in the release of free radicals. The chemical stress that accompanies this reaction will oxidise organic matter, coagulate tissue and destroy bacteria causing the excess tissue to slough off (Hanif et al, 2003).

The silver nitrate pencil is usually not considered first-line therapy for hypergranulation and it tends to be reserved for more stubborn areas of overgranulation (Griffiths et al, 2001).



Figure 2. Overgranulation tissue.

Topical administration of silver nitrate to granulation tissue has produced good results in practice (Borkowski, 2005). Silver nitrate can be applied once or twice a day; the treatment is normally applied every one to four days, until the tissue has completely sloughed (Borkowski, 2005). It may be necessary to apply silver nitrate on more than one occasion because of recurrence (Borkowski, 2005). However, it is important to distinguish recurrence from other possibilities, such as malignancies.

There are currently no recommendations in the literature regarding the optimum application time of silver nitrate treatment. In practice the silver nitrate pencil is usually only rubbed onto the affected area, i.e. not held in place for a given period of time. Silver nitrate should only be used to treat areas less than the size of a thumbnail, as a general rule (Rollins, 2000).

Chemical burns have been reported with silver nitrate, and are more likely to occur with longer application times (Hanif et al, 2003). A topical barrier preparation such as petroleum jelly or white soft paraffin should be applied to protect the normal skin surrounding the area of overgranulation. A dressing may also be applied to absorb wound exudate (Griffiths et al, 2001).

Tissue staining may hinder interpretation of healing, and nurses or clinicians should also be aware of the rare complication of methaemoglobinaemia (a cause of cyanosis) (Rollins, 2000).

Electrolyte imbalance is another possible complication of silver nitrate use. It seems unlikely that this would be

a problem in the management of small amounts of hypergranulation, although this has not been investigated (Nguyen et al, 1999).

Lloyd-Jones (2006) reported resolution of overgranulation tissue using a silver hydrofibre dressing, but this took some weeks to resolve which is much longer than other treatments. The author does, however, pose the question of whether the most appropriate silver dressing product was used in this study and if the use of silver products on overgranulation tissue is appropriate. With the length of time the overgranulation tissue took to resolve it could be argued that the same result would have been achieved without any intervention or it may have been the pressure from the outer dressing that resolved the overgranulation.

#### Foams

A popular treatment option is the use of a polyurethane foam applied directly to the overgranulation tissue with light pressure. This provides a non-traumatic treatment option in the absence of clear evidence to support the alternative methods (Cameron and Newton, 2004).

Harris and Rolstad (1994) reported the findings of a small clinical trial of a polyurethane foam to treat overgranulation. A prospective non-controlled correlational study was undertaken with 10 patients and 12 wounds using a polyurethane foam dressing to reduce hypergranulation tissue. The results demonstrated a significant decrease in height of 2mm of granulation tissue from baseline to measurements taken two weeks later ( $p < 0.01$ ). It was concluded that the pressure of the foam on the granulation tissue reduced the oedema and flattened the overgranulation tissue. When foam dressings were advocated for use in overgranulation tissue it was suggested that two pieces of foam were applied to increase the pressure on the tissue (Harris and Rolstad, 1994).

#### Corticosteroid preparations

Topical corticosteroid preparations are considered the treatment of choice

for hypergranulation. It should be noted, however, that topical steroid preparations are not licensed for the treatment of hypergranulation, and therefore responsibility for their use lies with the prescriber.

These agents reduce the inflammatory response although they might retard wound closure and alter wound quality (Kloth, 1990). Connelly et al (2005) reported limited resolution of overgranulation tissue around stoma sites with the use of silver nitrate or topical corticosteroids applied directly to the tissues but did demonstrate resolution when the topical steroid solution was applied to the stoma device 15–20 minutes before application. It would appear from their observations that a combination of corticosteroid and pressure produced the best results.

Historically, Terra-Cortril ointment has been applied to overgranulation tissue with success. There is, however, no literature to back up these claims only anecdotal and expert opinion. The two active ingredients, hydrocortisone and oxytetracycline, reduce inflammation and fight infection, respectively.

Lyon and Smith (2001) reported resolution of pyoderma gangrenosum and dermatoses around stoma sites with the use of Haelan Tape (Typharm, Bournemouth).

#### Haelan Tape

Haelan Tape is a protective, waterproof, occlusive dressing that is recommended for the treatment of recalcitrant dermatoses. This includes hypertrophic scarring, pyoderma gangrenosum and overgranulation tissue around stoma sites.

Haelan Tape is a transparent, plastic surgical tape (Blenderm; 3M Healthcare, Loughborough), impregnated with 4 mg/cm<sup>2</sup> fludrocortide (flurandrenolone), which allows steady diffusion of the steroid to the affected site. Fludrocortide is a fluorinated, synthetic, moderately

potent corticosteroid. As with other topical steroids, the therapeutic effect is primarily the result of its anti-inflammatory, anti-mitotic and anti-synthetic activities.

One of the main advantages of the presentation of the steroid in a tape form is the ability to cut the tape to fit around tubes, e.g. percutaneous endoscopic gastrostomy (PEG) tubes and supra-pubic catheters. It is also possible that the pressure exerted by the tape while in situ has a positive effect on the reduction of overgranulation tissue. Haelan Tape is also licensed for use in recalcitrant dermatoses and, as previously stated, overgranulation tissue has the same histological profile as pyogenic granulomas.

It is presented in a cardboard dispenser, containing either 50cm (green dispenser) or 200cm (yellow dispenser) of tape that is 7.5cm wide and protected by a removable paper liner.

#### Application to overgranulation tissue

Haelan Tape should be applied to clean, dry skin which is free of hair. The tape need only remain in place for 12 out of 24 hours, but clinical practice has shown that 24-hour use is more advantageous.

Corners should be rounded off to prevent excess pressure and rolling of the edges. The tape is cut 5mm larger than the treatment area (it is very easy to prepare a variety of dressing shapes including 'key hole' techniques). Remove the paper backing and apply the adhesive side of the tape to the skin. Stroke the back of the tape gently from the middle outwards to ensure contact between the tape and the skin, avoiding excessive tension as this could result in skin stripping on removal. If longer strips are to be applied, the lining paper should be removed progressively. If irritation or infection develops, the tape should be removed and a physician consulted.

Local and systemic toxicity of medium- and high-potency topical

corticosteroids is common, especially following long-term continuous use. Long-term continuous therapy should be avoided in all patients irrespective of age. Application under occlusion should be restricted to dermatoses in very limited areas. If used on the face, courses should be limited to five days and occlusion should not be used. This is not a problem when treating overgranulation as treatment lasts a maximum of seven days. In the presence of skin infections, an appropriate antifungal or antibacterial agent should be used. If a favourable response does not occur promptly, fludrocortide (flurandrenolone) should be discontinued until the infection has been adequately controlled.

The following local adverse reactions may occur with the use of Haelan Tape: burning, itching, irritation, dryness, folliculitis, hypertrichosis, acneiform eruptions, hypopigmentation, perioral dermatitis, allergic contact dermatitis, maceration of the skin, secondary infection, skin atrophy, striae, and millaria.

#### Using Haelan Tape in clinical practice

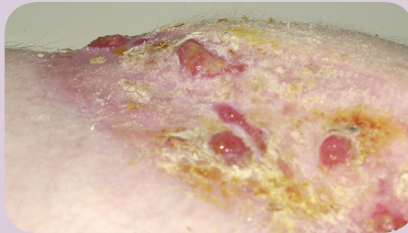
Within the author's trust, Terra-Cortril ointment had been used as the treatment of choice for overgranulation. However, following its withdrawal from the UK, an alternative treatment was required. The author carried out a small comparative evaluation of available treatments (foam dressings, silver alginate, silver foam, Haelan Tape) on 25 patients with a variety of wound types.

The resolution of overgranulation tissue was noticed within seven days of treatment with Haelan Tape in:

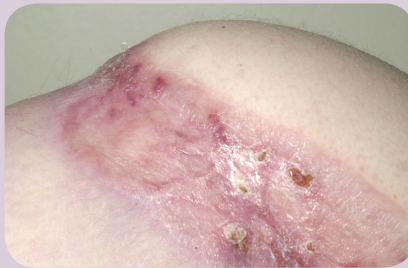
- ▶▶ A 16-year-old girl following surgery (Box 1)
- ▶▶ A 66-year-old man who developed a lymphocele following repeated shoulder surgery and overgranulation tissue at the operation site
- ▶▶ Dehisced abdominal wounds
- ▶▶ Venous leg ulcers in patients with a history of intravenous drug misuse
- ▶▶ Around PEG and supra-pubic catheter sites.

**Box 1. Case study using Haelan Tape**

The patient, a 16-year-old girl, was involved in a collision with a car, resulting in a fractured femur and patella in the left leg. This required debridement and a left latissimus dorsi flap to the left knee. Problems occurred with overgranulation tissue following the removal of stabilising wires through the patella (Figure 1). The tape was applied following bathing and left in situ for 24 hours. Haelan Tape was applied on a daily basis for five days, which resulted in rapid resolution of the overgranulation tissue. The wound healed completely within two weeks following treatment with Haelan Tape (Figure 2).



**Figure 1. Overgranulation tissue present.**



**Figure 2. Resolution of overgranulation following application of Haelan Tape.**

The results of this small study indicated that resolution of overgranulation occurred in the shortest time with Haelan Tape and that this was the most cost-effective product to use. As a result, Haelan Tape was adopted as the topical treatment of choice for overgranulation tissue in the author's trust.

**Conclusion**

Overgranulation tissue is a common problem encountered by all disciplines within wound care. As can be seen from the literature there are several solutions for this problem, some have an immediate effect, e.g. silver nitrate application, but may delay wound healing by reverting the wound back to the inflammatory phase of healing. Other products, such as foams and silver dressings, can take up to six weeks to address the overgranulation tissue, again delaying healing. Corticosteroids are quick acting but are not licensed for use on open wounds. Haelan Tape can be cut to fit around any tubes or lines therefore can be used effectively for patients with suprapubic catheters and PEG sites. In the author's opinion, Haelan Tape is an efficacious and cost-effective treatment for overgranulation in a variety of wound types. **WUK**

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**Key Points**

- ▶▶ Overgranulation tissue prevents or slows epithelial migration and thus delays wound healing.
- ▶▶ In time, overgranulation may resolve itself, but most practitioners feel the need to remove it.
- ▶▶ Treatment choices include the use of silver nitrate, corticosteroids, foams or Haelan Tape.
- ▶▶ Haelan Tape is a steroid impregnated tape that is recommended for the treatment of recalcitrant dermatoses.
- ▶▶ Haelan Tape is an efficacious and cost-effective option for the treatment of overgranulation in a variety of wound types.