

HAEMATOMAS: MANAGEMENT AND TREATMENT

Lower-limb haematomas require prompt intervention in order to minimise the extent of tissue loss. Management can be challenging, as people with lower-limb haematomas are frequently older and often present with multiple comorbidities, or have been prescribed medications that affect the healing potential of these wounds.

“A lower-leg haematoma is a severe, acute wound, and prompt action needs to be taken to stop the bleeding and reduce the extent of tissue damage and skin loss.”

There is little incidence data on the numbers of people who suffer minor trauma to the lower leg. Data from New Zealand indicate that lower-leg skin tears and haematomas affect 33 per 1,000 of the population per year; most of these injuries occur among those older than 70 years of age (Laing et al, 2002).

Of those affected, 90% are women. This is because most of these injuries occur in the home when older women are carrying out domestic chores. Another risk factor is the wearing of skirts, which do not provide protection from injuries that trousers maybe would. Women are also at risk due to skin changes that occur as a result of decreasing hormone levels (Laing et al, 2002; Sussman and Golding, 2011). The vast majority of these injuries occur in the home and are caused by household and garden items (Laing and Tan, 2009).

A haematoma can be described as a swelling caused by bleeding into the tissues usually as the result of injury (Smith and Williams, 2004). Although most lower-leg haematomas are caused by trauma, some will form spontaneously (Pagan and Hunter, 2011). The degree of severity of lower-leg injury varies. Bruising or

superficial skin tears may develop in some people, but lower leg injuries may develop into haematomas in others. A lower-leg haematoma is a severe, acute wound, and prompt action needs to be taken to stop the bleeding and reduce the extent of tissue damage and skin loss. This is especially important in older people, who often have comorbidities such as vascular disease, or are taking anticoagulants and medication that can affect skin and wound healing (Pagan and Hunter, 2011).

Lower-leg haematomas can also be closed or open (Pagan and Hunter, 2011). In the development of a closed lower-leg haematoma, large collections of blood accumulate, the pressure within the haematoma can exceed the blood pressure in the dermal and subdermal capillaries, and this, in turn, can result in large areas of necrosis (Cham et al, 2005). In these instances, prompt surgical action is needed to evacuate the haematoma and release the tension created.

Literature on the management of lower-leg haematoma is sparse compared to the management of skin tears, yet it is an injury that is frequently seen by nurses working in acute hospitals. One study in

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New Zealand found a year-on-year increase in the incidence of lower-limb injuries between 1986 and 1999 (Laing et al, 2002). With a growing older population in the UK, the incidence of people who develop a haematoma is likely to increase. Lower-leg haematoma is also associated with an increase in mortality. One study found a mortality rate of 11% within 6 months of developing a haematoma, due to the effects a lower-limb injury can have on pre-existing comorbidities (Rees et al, 2007), while other authors have found a mortality rate of 15% over a 2-year period (Thompson et al, 2012).

Risk factors

The effects of skin aging is a major risk factor in the development of lower-limb haematomas. Epidermal thinning and dermal-epidermal junction flattening cause diminished cohesion of these skin layers, making them vulnerable to trauma (Nazarko, 2007).

Elderly patients may also have several comorbidities or take medications that make them susceptible to lower-leg haematomas. People prescribed anticoagulants such as warfarin are at an increased risk of development of a lower-leg haematoma, especially those who have an uncontrolled, high international normalised ratio (Thompson et al, 2012). Corticosteroids have multiple side-effects that not only make the skin vulnerable to trauma, but also delay healing and increase susceptibility to infection, and any injury then becomes difficult to heal.

Surgical management

A simple and safe technique that quickly releases the tension created by a closed haematoma uses a Yankauer sucker attached to wall suction to evacuate the haematoma under local anaesthetic (Karthikeyan et al, 2004).

This procedure can be carried out in the emergency department or on the hospital ward by trained surgical or medical staff. This procedure should only be carried out once it has been determined that the patient is no longer at risk of further bleeding (Karthikeyan et al, 2004). If there is a laceration in the haematoma, this is used as a port for the sucker, otherwise a stab incision is made in the skin overlying the haematoma. The haematoma is evacuated using a to-and-fro movement that breaks up the clot. The cavity is irrigated with saline, and the laceration is left open for free drainage, or closed with adhesive tapes. Regular analgesia should be administered once the procedure has been carried out to control any pain the patient is experiencing from the injury.

The benefit of carrying out this procedure in a timely manner is that it minimises the onset of complete skin loss, necrosis, infection and possible skin grafting. Often, patients are waiting to be assessed fit for general or regional anaesthesia or for test results before treatment of the haematoma can take place. This technique not only reduces the effect of further skin damage, but can eliminate the need for further treatment or debridement. There are occasions where a patient will require surgical debridement and possible skin grafting. Where this is not possible because a patient has underlying comorbidities, or because they have risks for anaesthesia, the haematoma is managed conservatively.

Conservative management

When a lower leg haematoma is managed conservatively, the aim is to debride the haematoma as atraumatically as possible to prepare the wound bed for eventual healing. This can be done in a number of



Figure 1. A haematoma that is still actively bleeding.



Figure 2. A dry haematoma that needs hydration to assist debridement.

ways, but the debridement method needs to be tailored to the patient. A thorough assessment must be carried out, taking into account any associated comorbidities and whether there is still a potential that debridement could cause further bleeding and damage (*Figure 1*). If there is no risk of further bleeding from the haematoma, debridement can take place.

Hydrogels are commonly used to hydrate the clot and eschar that may have developed (*Figure 2*). Gels help to soften the haematoma and make it easier to scoop out the clot and eschar that has formed. However, this must be done with caution because it can be painful for the patient. The use of hydrogels to aid debridement can be slow and, over time, maceration to the surrounding skin can occur. Infection is a more serious complication where hydrogels are used and are taking time to hydrate.

To reduce the risk of infection, the haematoma needs to be removed as promptly as possible (Beldon, 2011). If hydrogels are not doing this, then alternative methods of conservative debridement need to be considered. One option for rapid debridement is the use of the Debrisoft debridement pad (Stephen-Haynes and Callaghan, 2012). This pad consists of monofilament fibres cut with angled tips designed to penetrate irregular shaped areas and remove devitalised skin and wound debris (NICE, 2014). The pad is soft and enables gentle debridement of any clots and devitalised tissue. It can also be used in conjunction with hydrogels. The debridement pad can be used to gently remove as much of the clot and eschar as possible each time the dressing is changed. Once the debridement pad has been used, a hydrogel can be reapplied to soften the haematoma further if needed.

Larval therapy is an alternative method that delivers rapid and non-invasive debridement of a haematoma (Rafter, 2012). It is important to fully assess the wound to determine if it is safe to use larvae. Larvae can be used in bags or free-range. Free-range larvae are more effective because they have the ability to roam over the haematoma. Free-range larvae should not be used if there is any uncertainty about the presence of blood vessels or other delicate structures under the haematoma (Rafter, 2012).

Management post-debridement

Where a haematoma has undergone surgical debridement and skin grafting is to be carried out, the clinician will have the challenge of managing two wounds. Negative pressure wound therapy is often applied to skin grafts to increase the rate of the grafts taking (Webster et al, 2014).

Where a haematoma has been debrided and is not grafted, the wound is managed like any open wound with the use of dressings to facilitate healing. A simple non-adherent dressing should be used as a primary dressing. Where exudate is a problem, a foam can be used as a primary dressing instead.

One novel dressing advocated by the plastic surgeons at Nottingham University Hospital for the management of a haematoma post-debridement is the zinc-impregnated bandage. Topical zinc has been used medicinally in wound care for more than 3,000 years and is credited with anti-inflammatory, autodebridement and indirect antibacterial action (Lansdown, 1996; Sussman and Golding, 2011). It is debatable how beneficial zinc impregnated bandages are to wound healing. A recent systematic review concluded that there was scant high quality evidence to suggest that topical zinc-based products are effective in the promotion of healing (O'Connor and Murphy, 2014).

One major factor to take into consideration when managing a haematoma post-debridement is the possibility that the patient may also have arterial disease, venous disease, leg oedema or lymphoedema, especially if they are older, which will have an effect on the rate of healing (Nelzen, 2008).

An ankle brachial pressure index (ABPI) should be carried out as soon as the patient is able to tolerate such a procedure following the development of a haematoma to determine whether the patient is suitable for compression therapy. Any patient found to have severe arterial disease based on an ABPI should be referred to a vascular specialist (NICE, 2015)

Haematoma prevention

Lower-limb haematomas are

debilitating and can often lead to other complications if prompt treatment is not carried out. Because they affect the elderly who often have multiple comorbidities, a haematoma that originally develops as an acute wound can become a chronic wound if wound healing becomes protracted as a result of these comorbidities.

Often these injuries occur in healthcare settings (Everett and Powell, 1994), and strategies can be implemented to prevent haematomas in these environments. Stephen-Haynes and Carville (2011) identified two strategies for reducing the incidence of skin tears and lower leg trauma, namely creating a safe environment and maintaining good skin care.

Clinicians should ensure that corridors and washrooms have adequate handrails, and that patients are wearing appropriate footwear to prevent falls and the possibility of traumatic injuries to the legs. Good skin care can be achieved by keeping the skin hydrated by maintaining a good diet and adequate fluid intake. Washing the skin with an emollient is less likely to dry the skin than soap. Twice-daily application of emollients has been demonstrated to reduce the incidence of skin tears by 50% (Carville et al, 2014).

A pilot randomised control trial is currently investigating the use of protective socks containing Kevlar fibre to prevent skin tears and lower leg injuries (Powell et al, 2015). Kevlar is the material used in stab-proof vests. The results of this trial have not been published yet, but it will be interesting to see if the socks are effective at preventing lower-leg trauma.

Cost of haematoma

It has been estimated that the development of a lower-leg

haematoma can result in an average inpatient stay of 11 days (Thompson et al, 2012). In terms of financial expenditure, an injury requiring skin grafting and an inpatient stay of 11 days is estimated to cost the NHS £3,500 (Thompson et al, 2012).

This cost may be much higher when social care is taken into account. When elderly patients develop a lower leg haematoma, their care needs often change due to the debilitating nature of these injuries (Rees et al, 2007). Social care requirements increase, with an overall decline in the medical and social condition of these patients over time (Rees et al, 2007). A quarter of all patients who develop a lower leg haematoma required a period of rehabilitation after discharge from hospital, and 17% had undergone a permanent change in their social circumstances by 6 months, post-discharge (Rees et al, 2007).

Conclusion

Lower-leg trauma and haematoma formation are debilitating yet avoidable injuries that have a financial cost and affect the patient's quality of life.

The incidence of lower limb haematomas is increasing (Laing et al, 2002). With an increase in the elderly population and its association with comorbidities that make patients susceptible to lower leg haematomas, there needs to be greater emphasis on developing prevention strategies nationally and locally in both primary and secondary care.

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