Understanding wound debridement.

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Introduction

Autolytic debridement describes the body's natural method of wound bed cleansing, helping the body to prepare the wound bed for healing. In acute wounds autolytic debridement occurs automatically and often does not require intervention, as during the inflammatory stage of a wound neutrophils and macrophages digest and removes devitalized tissue, cell debris and contaminants, clearing the wound from any cellular barriers to healing. Whereas, in chronic wounds healing is often delayed, frequently this is due to inadequate debridement, in chronic wounds the autolytic process can become overwhelmed by high levels of endotoxins released from damaged tissue (Broadus, 2013). Therefore wound debridement becomes an integral part of chronic wound management and practitioners involved in wound care must be fully competent at wound bed assessment and have an awareness of the options available for debridement. This article will review wound bed assessment, highlighting variations in devitalised tissue and explore options available for wound debridement taking into consideration patients' pain and quality of life.

Wound Assessment

Management of a wound, be it chronic or acute, involves continual effective holistic assessment and ongoing evaluation of the patient, to include aetiology of the wound, wound bed, peri wound area, signs of infection, general patient malaise and review of wound dressings chosen to promote the healing process, (Ousey & Atkin, 2013). This continuous and accurate wound assessment is essential to ensure appropriate and realistic goal setting, (Collier, 2003). It is essential that the practitioner holistically assesses the whole of the patient not simply just the wound bed. The World Union of Wound Healing Societies [WUWHS] (2008) consensus document stated to enable effective treatment of patients with wounds the diagnostic process will:

- Determine the cause of the wound
- Identify any co-morbidities/complications that may contribute to the wound or delay healing
- Assess the status of the wound
- Help develop the management plan

Following holistic assessment of the patient the focus then can turn to the wound bed, to facilitate practitioners structured assessment of the wound bed wound assessment tools can be used, an example of a wound assessment tool is TIME. The International Advisory Board on Wound Bed Preparation (2004) developed the acronym TIME (T = Tissue, non-viable or deficient; I = Infection or inflammation; M = Moisture imbalance; E = Edge of wound, non-advancing or undermined). TIME provides a structure to allow the clinician to focus on certain aspects of the wound to facilitate the appropriate and realistic goal setting. Often on wound care plans the stated aim of the intervention is 'to promote healing', having such a broad and non-specific goal will make reassessment difficult, which raises the question, "how do you assess promoting healing?" Whereas, if care plan goals are linked to assessment of the wound bed goals can be more specific, for example if wound assessment using TIME identifies that there is a problem with non-viable tissue the aim of the wound care plan wound be 'to debride'. Having clear aims then allows for meaningful evaluation of whether the current wound product is meeting the desired aims.

Devitalised Tissue

Devitalised tissue or non-viable tissue are terms which are used interchangeably, they describe tissue that has no blood supply which will not come back to life with treatment or time, (Wounds UK, 2013). This devitalised non-viable tissue needs removing to allow healing to occur. Non-viable tissue can occur for a number of reasons these include infection, ischaemia, hypoxia of the wound bed or dehydration of the wound bed. Non-viable tissue comes in many different forms from thin superficial slough (figure 1), thick slough (Figure 2), dehydrated slough (Figure 3), and strongly adhered dry necrotic tissue/eschar (Figure 4).

Figure 1

Figure 2

Figure 3

Figure 4

The presence of devitalised tissue will delay wound healing as it prevents the formation of granulation tissue, it can also be a source for bacterial growth, increasing the risk of infection, (Broadus, 2013). Therefore practitioners need to focus on removing the non-viable tissue as rapidly as possible, but practitioners also need to be aware that in certain situations debridement should be actively avoided. For instance, in patients effected by peripheral arterial disease non-viable tissue such as distal necrosis may be intentionally left to auto amputate (Figure 5), only after adequate revascularisation should debridement be encouraged and this should only be initiated by the specialist team.

Figure 5

Debridement

The word debridement means “to remove constraint”, in relation to wound management debridement means to remove adherent, dead or contaminated tissue from the wound and is completely separate from the act of cleansing which is defined as the removal of dirt, loose metabolic waste or foreign material, (Strohal et al., 2013). For many years debridement has been recommended by clinical guidelines from bodies such as European Wound Healing Society (Stohal et al., 2013) and Wounds UK (2013). But there has been a lack of evidence to investigate whether debridement does accelerate wound healing, however a recent study by Wilcox et al., (2013) does provide the evidence that regular wound debridement does indeed facilitate wound healing. Wilcox et al., (2013) study analysed 154,644 patient records over a 4 year period, all of the patients attended a wound healing clinic for a variety of wound types, the most common of these were venous leg ulcer (26.1%) followed by diabetic foot ulceration (19%). Their retrospective study showed that nearly twice as any venous leg ulcer and diabetic foot ulcerations completely healed with frequent debridement compared with those treated less frequently 50% versus 30% in the venous leg ulcer group and 30% versus 13% in the diabetic foot ulceration group. Wilcox et al., (2013) concluded that frequent debridement resulted in shorter healing times for all wound types ($P<0.001$).

Options of debridement

Many factors will influence the decision of which method of debridement to use - these include type of tissue, pain, patients environment, patients choice, age, skills of practitioner, resources, patients quality of life and professional regulations and guidelines, (Strohal et al., 2013). There are many different methods of debridement incluing: autolytic, larval, mechanical, sharp, surgical, and hydrosurgery. Debridement can be performed just once, episodic or continuously over a number of weeks, (Ousey & Cook, 2012). It is important to remember that certain debridement techniques

require the practitioner to have specific skills and competencies, not all nurses involved in wound care need to be able to perform all methods of debridement. However every nurse must be competent at deciding which method of debridement is required. Whilst they may not necessarily be trained in that specific option they should be able to recognise the need and refer on to an appropriately qualified practitioner. Wound UK (2013) consensus document for debridement summaries that:

For practitioners to consider accelerating healing through debridement, they must be equipped with knowledge and understanding of:

- the debridement options available, how and why they are undertaken
- the interventions (including referral) open to them; and
- how to measure the success of those interventions.

This will enable practitioners to:

- recognise when debridement is required
- decide which technique is most suitable; and
- act/refer appropriately to ensure the patient receives the best care.

Autolytic Debridement

The natural process of autolytic debridement is the most common method and can be undertaken by nurses without specialist skills. All wound dressings that optimise a moist wound environment by adding moisture to the wound bed or removing excess fluid aids the process of autolysis, where the body's enzymes breaks down the non-viable tissue. Autolytic debridement is often used as the sole source of debridement but this can require numerous treatment over a long period of time. This option is selective, painless, non-invasive and easy to perform but can be slow which can potentially increase the risk of infection or maceration.

Larval

Larval therapy or maggot therapy biologically debrides the wound bed by liquefying and digesting neurotic tissue, killing and consuming bacteria and additionally stimulating wound healing by promoting fibroblast growth, (Broadus, 2013). They come either 'free range' (placed directly onto the wound bed) or contained within bags. Larval therapy provides rapid, selective debridement but attracts higher unit costs and may not readily accepted by some patients.

Mechanical

Mechanical debridement physically removes debris from the wound bed and does so rapidly compared with other methods but was previously thought to be painful and non-selective. Mechanical debridement has only recently come back into accepted use within the United Kingdom (UK), previous methods of mechanical debridement were the use of 'wet-to-dry' gauze. This involved placing a piece of wet gauze over the wound allowing the gauze to dry out, adhering itself to the wound bed and then physically removed effectively 'waxing' the top of the wound. This practice has not been used for many years in the UK due to the pain and trauma caused to the patient and the wound bed. However, recently the use of mechanical debridement is again on the increase through the use of monofilament debridement pads (Debrisoft). Debrisoft is a single-use, soft, polyester fibre pad., which is gently wiped across the wound and the exudate, dead cells and wound debris are removed and retained in the monofilament fibres. Using this device, debridement takes on average two to four minutes per wound and is done without the need for analgesia, (NICE, 2014). National Institute for Health and Care Excellence (NICE) (2014) has recently published recommendations for the use of Activa Healthcare's Debrisoft monofilament debridement pad in the management of acute and chronic wounds. They reviewed the evidence and found that debridement (by Debrisoft) was effective in 93.4% (142/152) of the sessions. During the debridement procedure 45% of patients reported that they experienced no pain, 50.4% reported slight discomfort of short duration (mean 2 minutes) and 4.6% reported moderate pain of short duration (mean 2.4 minutes). No side effects were reported after the procedure by 56 out of 57 patients, additionally no adverse events were reported. Clinicians reported that the Debrisoft pad removed debris, slough, dried exudate and crusts efficiently, without damaging the fragile skin surrounding the wound. (NICE, 2014). NICE (2014) calculated cost savings through the use of Debrisoft within the community, estimating Debrisoft could save the National Health Service (NHS) up to £484 per patient for complete debridement of a wound, compared to current standard management.

Sharp debridement

Sharp debridement should only be performed by a practitioner with the proven skills and knowledge, it can be performed in a treatment room, at patients' home or at the bedside, however Leak (2012) argues that sharp debridement is not suitable as a home based treatment due to the

lack of resources available if complications were to occur. Sharp debridement is the removal of dead tissue with scissors, scalpel and / or forceps often just above the level of viable tissue, so it is vital that the practitioner is able to distinguish between viable and non-viable tissue. Sharp debridement is quick and selective in experienced hands and is often pain fee for the patient.

Surgical Debridement

Surgical debridement is performed within the operating theatre often by a surgeon, surgical debridement offers instant results and involves complete debridement of the wound bed down to healthy viable tissue. However, it can result in a larger wound as some viable tissue may be sacrificed. Surgical debridement often requires a form of anaesthetic to ensure a pain free intervention with continued analgesia. It is associated with increased costs due to being performed in a theatre environment.

Hydrosurgery

Hydro surgery involves the use of pressurised water or saline as a cutting tool through a disposable handset, it provides a quick method of debridement which is selective but can be painful for patients occasionally requiring local or regional anaesthetic. Hydro surgery can be performed in a non-theatre environment, such as a treatment room but caution is needed due to the water vapour spray and potential for cross contamination; protective clothing and goggles need to be warn. Hydro surgery can be costly due to the price of the disposable handset but can be more cost effective when compared to surgical debridement as it does not require theatre time.

Conclusion

Debridement is considered an essential part of wound bed preparation, removing the barriers that impede wound healing. However, currently there is no robust evidence to support one technique of debridement over another, ultimately the choice of which method to use rests on the expertise and judgement of the clinician, (Falabella, 2006). Practitioners need to be fully aware of all options of debridement as suboptimal care can lead to delayed healing, increased pain, increased risk of infection and inappropriate use of wound dressings, all of which impact on patients' quality of life (Ousey & Cook, 2011). Patients with chronic wounds face a number of issues such as pain, restrictions in mobility, social isolation and psychological problems (Franks & Moffatt, 1999), therefore care planning needs to incorporate all of these issues whilst simultaneously preparing the wound bed for healing as the ultimate goal in wound management is to improve patients overall quality of life.

References

Broadus C (2013) Debridement options: BEAMS made easy. Wound Care Advisor 2(2): 15-18

Collier M (2003) The elements of wound assessment. Available at: http://www.nursingtimes.net/nursing-practice/clinical-zones/wound-care/the-elements-of-wound-assessment/205546.article Accessed 26/4/14

Falabella A F (2006) Debridement and wound bed preparation. Dermatologic Therapy 19(6):317-325.

Franks P & Moffat C (1999) Quality of life issues in chronic wound management. British Journal of Community Nursing 4(6):283-289

Leak K (2012) How to: Ten top tips for wound debridement. Wounds International 3(1).

NICE (2014) National Institute for Heath and Care Excellence medical technology guidance 17: The Debrisoft monofilament debridement pad for use in acute or chronic wounds. March 2014. Available at: http://guidance.nice.org.uk/MTG17/Guidance/pdf/English. Accessed 27/4/14.

Ousey K & Atkin L (2013) Optimising the patient journey: made easy. Wounds UK 9(2): 1-6.

Ousey K & Cook L (2012) Wound Assessment: made easy. Wounds UK 8(2):1-4.

Stohal R, Apelqvist J, Dissemond J, et al EWMA Document: Debridement. Journal of Wound Care 22(1):S1-S52.

Wilcox JR, Carter MJ, Covington S (2013) Frequency of debridements and time to heal: a retrospective cohort study of 312,744 wounds. JAMA Dermatology 149(9):1050 - 1058

World Union of Wound Healing Societies (2008) Principles of Best Practice: Diagnostics and Wounds. A consensus document. MEP Ltd, London

Wounds UK (2013) Effective debridement in a changing NHS: a UK consensus . London: Wounds UK, 2013. Available from: www.wounds-uk.com. Accessed 26/4/14