Surgical and conservative sharp wound debridement for chronic wounds

22/01/2010

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Question

What is the best available evidence regarding the use of surgical and conservative sharp debridement of chronic wounds?

Clinical Bottom Line

During the natural healing process the wound is cleared of cellular debris through the phagocytic activity of macrophages and lymphocytes; a process referred to as autolysis. It is believed that the presence of necrotic tissue may delay the healing process by inhibiting the migration of epithelial cells and by acting as a medium for bacterial growth [1] (Level IV). However, the healing efficacy of debridement versus no debridement has not yet been empirically validated by clinical prospective randomised controlled trials (RCTs) [10] (Level I)

When the granulation process and the subsequent epithelialisation of the wound are inhibited due to the presence of devitalised / necrotic tissue, a common practice in wound management is to debride the wound surface and the wound bed of the non-viable tissue [1,2,3] (Level IV). Debridement is recognised as an important element of wound bed preparation [4] (Level IV) and is defined as 'the removal of foreign matter or devitalized, injured, infected tissue from a wound until the surrounding healthy tissue is exposed' [3] (Level IV).

Surgical and conservative sharp debridement offer the fastest way of removing nonviable, necrotic tissue from the wound bed. It aims to transform a chronic wound into an acute one that progresses through the normal healing stages. In addition to removing unwanted tissue, surgical and sharp debridement further contribute to the wound healing process by improving the vascularity of wound bed. Surgical debridement is performed by a surgeon in an operating theatre under general or local anaesthesia. It is considered when the presence of nonviable tissue is extensive [7] (Level II).

Conservative sharp wound debridement (CSWD) is the removal of loose avascular tissue without pain or bleeding. It is appropriate when the presence of nonviable tissue is of moderate amount. It usually (but not always) involves local anaesthesia and can be performed in the patients' home or clinic by a trained clinician using a scalpel or curette [7,8] (Level II & IV respectively). CSWD can be performed by a competent health care professional who has undergone relevant education and training and subject to workplace policies and procedures [8,9] (Level IV).

A prospective study that compared debridement and standard treatment (26 patients; 28 ulcers) vs. standard treatment alone (27 patients; 27 ulcers) in the management of non-healing chronic venous leg ulcers found the following [7] (Level II):

- Comparable healing rates in both groups overall, but faster healing rates were observed at 4 weeks following debridement in the intervention group with a reduction in the mean ulcer surface area of 6 cm^2 compared to a reduction of 1 cm^2 in the control group (p=0.02)
- At 20 weeks post-debridement a 7.4 cm^2 reduction was observed in the intervention group compared with a 1.3 cm^2 reduction in the control group (p=0.008).
- Between weeks 8 and 20 post-debridement, 16% of study ulcers vs. 4.3% of control ulcers achieved complete healing.
- There were no differences in the forms of compression or the types of dressings used between the groups.
- Standard treatment alone involved the following:
    - A four-layer bandage compression system was used in both groups
    - Short stretch bandages and tubular bandages (tubigrip) were used if the four-layer compression system could not be tolerated
    - Non or low-adherence dressings were used in both groups and the frequency of dressing changes was similar

RISK FACTORS

- Surgical / sharp debridement carries with it an increased risk of post-debridement haemorrhage from damage to underlying blood vessels. This risk is increased in [7] (Level II):
    - Patients taking anticoagulants

  - Wounds that are located in the gaiter area of the leg due to the "close proximity to the long saphenous vein".
- Surgical / sharp debridement must be performed by a clinician who is clearly competent in dealing with such haemorrhaging should it be necessary [3] (Level IV).
- Surgical / sharp debridement is not recommended under the following circumstances [3] (Level IV):
  - lack of practitioner experience
  - non-healing ulceration due to poor vascularisation
  - septicaemia without antibacterial cover
  - a medically unfit patient
  - Lack of sterile sharp instruments [9] (Level IV)
- Surgical debridement carries with it an increased risk of pain. Controlling pain can involve the following [2] (Level III):
  - Directly infiltrating anaesthesia into the wound bed
  - In extreme cases, the use of general, spinal or epidural anaesthesia
- An increased risk of bleeding is associated with surgical debridement. If pressure fails to control the bleed, other options available to the surgeon in the operating room include the following [2] (Level III):
  - Ligation of the bleeding vessels
  - Cauterize the wound with silver nitrate
  - Electrocautery
  - Minimal bleeding may be controlled by topical application of haemostatic agents, such as thrombin or oxidized cellulose
- CSWD is not recommended under the following circumstances [9] (Level IV):
  - The presence of densely adherent necrotic tissue when interface between viable and nonviable tissue cannot be clearly identified.
  - If the client has an impaired blood clotting condition or is taking anticoagulant medication.
  - If there is increased risk of bleeding or exposure of blood vessels e.g. in malignant wounds.
  - In the non-infected ischaemic ulcer covered with dry eschar and when tissue oxygenation is insufficient to support infection control and wound healing e.g. diabetic ulcer with dry gangrene.
  - In the client who is terminally ill when palliative management is the goal of care and comfort and odour control is achieved by alternate management.

OTHER FACTORS FOR CONSIDERATION

- If local anaesthesia is required, applying anaesthetic cream at least 30 minutes prior to debridement is recommended [7] (Level II).
- Minimal post-debridement bleeding can be managed by gently applied local pressure and a calcium alginate dressing [7] (Level II).
- Surgical debridement is expensive as it involves theatre costs [3,7] (Level II)
- Conservative sharp debridement can be conducted in outpatient settings and is therefore less expensive to perform [3] (Level IV)
- The form of debridement should be selected with the following in mind [3] (Level IV):
  - Wound location
  - Extent of necrotic tissue
  - Presence of infection
  - Patient pain
  - Availability and safety of pain medication
  - Haemostasis availability and acceptability
  - Exudate volume and viscosity
  - Patient compliance with therapy
  - Patient choice where appropriate
  - Wound treatment aims
  - Patient prognosis and outcome goal
  - Clinical skill and knowledge

In summarising the evidence for debridement, it is advisable that interpretation of the data is viewed with caution due to the following considerations [1-11] (Level IV):

- The use of different end points to report debridement efficacy;
  - some studies assess effectiveness as 'wound readiness for grafting'
  - other studies use 'time to complete healing'
- Population groups and wound etiology differ across studies
- The number of patients evaluated is usually small
- High quality prospective randomised controlled trials and well-designed studies are lacking, thereby compromising the evidence base.
- There is a need for well designed studies that are powerful enough to differentiate between debridement methods for diverse groups

Characteristics of the Evidence

This evidence summary is based on a structured search of the literature and selected evidence-based health care databases. The evidence in this summary is from:

- Three literature reviews summarising the effectiveness of a number of debriding techniques [1,3,11]
- A review that summarised a number of debriding techniques and identified a number of other centre-based practices that may also contribute to wound healing [2]
- Two reviews explaining the application of the TIME acronym in the systematic assessment of chronic wounds [4,6]
- A literature review that summarised the development of wound care practices over time [5]
- A concurrently controlled, prospective parallel study over a 12-month period, that compared debridement and standard treatment (26 patients; 28 ulcers) vs. standard treatment alone (27 patients; 27 ulcers) in the management of non-healing chronic venous leg ulcers [7].
- A position statement on CSWD by the Wound, Ostomy and Continence Nurses Society [8]
- A wound care manual [9]
- A systematic review that concluded that there is insufficient high quality evidence that demonstrates the effectiveness of one debridement method over another, or that healing efficacy is increased by using debridement [10]
- A systematic review on diabetic foot ulcers demonstrating the clinical effectiveness of autolytic debridement in comparison to gauze-based debridement [11]

Best Practice Recommendations

- The wound healing process in venous leg ulcers is facilitated by surgical/conservative sharp debridement in combination with standard venous ulcer treatment (e.g. compression). (Grade A)
- If sharp debridement is conducted without the aid of local anaesthesia care must be taken to avoid the sensitive areas of the wound edge (Grade A).
- The application of local anaesthetic cream 30 minutes prior to debridement is recommended if required by the patient (Grade B).
- Care must be taken to avoid haemorrhage in patients taking anticoagulants (Grade A)
- Care must be taken to avoid damage to underlying blood vessels, particularly when the wound is located in the gaiter region of the leg (Grade A).
- Mild analgesics may be needed following debridement if the patient experiences pain (Grade B)
- A careful assessment must be made of the patient's suitability to the method of debridement (Grade B) (see risk factors above).

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