Evidence summary: Wound management: dressings – alginate

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Summary

While high-level evidence regarding the use of alginates is scarce, several literature reviews have demonstrated the value of the alginate dressing in management of a wide variety of wounds including those heavily colonised with pathogenic bacteria.

Question

What is the best available evidence regarding the effectiveness of alginate dressings in the management of wounds?

Clinical bottom line

Alginate dressings

Made from brown seaweed[1], alginate dressings form a gel when in contact with a wound surface. The intrinsic properties of the dressing determine its mode of interaction with calcium or sodium ions in the wound exudate. This interaction determines the adsorbent and absorbent characteristics of the alginate fibres and directs its use as a dressing[2].

In calcium alginate dressings the calcium ions in the dressing exchange with sodium ions in the wound exudate and transform the dressing fibres from water-insoluble calcium alginate into water-soluble sodium alginate. The resultant swelling of the alginate fibres forms a gel which entraps and immobilises bacteria carried into the dressing by wound exudate[3]. This gel can be lifted off during dressing removal or rinsed away with sterile saline. Bonding to a secondary viscose pad increases their absorbency.

Antimicrobial agents (e.g. silver) are incorporated into some highly absorbent dressings (e.g. calcium alginate, foam and hydrofibre) for use on heavily exuding, infected wounds. Assessment of wound exudate indicates healing progression[4].

Advantages

- Moderately to highly absorbent[1]
- Low adherence; therefore, removal is trauma-free[1]
- Haemostatic[5]
- Sheets, ropes and ribbon options enable close conformity to the wound bed[1]
- Requirement for dressing changes is often reduced – thus reducing cost[1]
- Can be used on infected wounds[1]
- Gel-forming dressings protect exposed tissue and underlying structures (e.g. tendons and joints) from desiccation during surgical procedures[5]. This may be enhanced by adding a secondary adhesive dressing.

Disadvantages[1]

- A secondary dressing may be needed to secure the alginate
- Under compression the absorbent properties of alginate is restricted.

Indications

- Diabetic foot ulcers[5,6] (Level II)
- Moderate to heavily draining wounds[1]
- Burn wounds and donor sites[5]
- Partial and full-thickness wounds, pressure ulcers/injuries (Stages III and IV), dermal wounds
- Surgical incisions or dehisced wounds[5]
- Sinus tracts, tunnels, cavity wounds, and infected wounds[1]
- Hemostasis on postoperative wounds[1]

Contraindications

- Dry eschar – where there is no exudate to activate the dressing
- Third-degree burns
- Surgical implantations
- Heavy bleeding.

Infected wounds

In the management of infected, exuding wounds, evidence (Level I)[7] has demonstrated the benefits of alginate dressings in:

- providing and maintaining a moist wound environment that is achieved when the alginate comes in contact with wound fluid and forms a biocompatible gel[8]
- reducing wound exudate
- reducing leakage from the wound dressing
- reducing maceration of the wound edge
- reducing the overall wound area
- reducing wound odour (notwithstanding the distinctive odour produced by alginates which is most noticeable during dressing changes)[1].

Alginates compared with other dressing materials

A review that assessed the evidence for the effectiveness of alginate dressings compared to other dressings reported the following results:

- Leg ulcers[5]

Paraffin gauze: 73% of leg ulcers treated with alginate showed overall improvement compared with 43% treated with paraffin tulle.

Knitted viscose: No significant differences were detected in healing outcomes between 26 wounds dressed with alginate and 24 wounds dressed with a simple knitted viscose dressing under compression.

Hydrocolloid dressings and Class III compression stockings No statistically significant differences in healing outcomes were detected; however, significantly lower pain scores were reported by those using alginates.

- Pressure ulcers[5]

When alginate dressings were compared with dextranomer paste used on full-thickness pressure ulcers, significantly higher rates of wound area reduction in a shorter period were reported in the alginate dressing group.

- Surgical wounds[5]

At dressing change alginate dressings were reported to yield reduced bacterial counts, be easier to remove and less painful when compared with proflavine soaked gauze/saline-soaked gauze/paraffin gauze/cotton gauze roll in the management of cavities arising following incision/drainage.

Using alginate dressings and topical agents

General principles

- Ensure that the dressing is comfortable and meets the patient's needs to enhance compliance with care requirements[9]. (Level IV)
- Choose the form of alginate for its ability to conform to the wound and its appropriateness to the wound characteristics, (e.g. high levels of exudate). (Level IV) A good fit between the alginate dressing and the wound increases the efficacy (absorbency) of the dressing[9].
- Flush all alginate fibres out of the wound at dressing changes as retained fibres can be reabsorbed and negatively affect wound healing[10]. (Level IV)

Risk Factors

Risk factors associated with alginate dressings are usually related to the inclusion of (anti-microbial) agents in the dressing itself. Clinicians need to remain diligent for early signs of intolerance to the treatment[9]. (Level IV).

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:

- A systematic review[7] (Level I) and a literature review that assessed the role of silver-based products in the healing of venous leg ulcers[4]. (Level IV)
- An RCT, involving 134 patients, comparing healing outcomes on non-ischaemic diabetic foot ulcers with the use of calcium alginate dressings and hydrofibre dressings found a statistically significant reduction of ulcer depth in the hydrofibre group[6]. (Level II)
- An evidence-based position document on wound infection management[9]. (Level IV)
- A literature review that assessed the efficacy of alginate silver-releasing dressings[2,5]. (Level IV)
- A literature review that summarised the development of wound care practices over time[8]. (Level IV)
- A summary of types of wound dressings, their uses, advantages and disadvantages[1]. (Level IV)
- An *in vitro* study that examined the chemical characteristics of alginate and fibre dressings in wound management in a laboratory setting[3]. (Level IV)
- Recommendations from regional health authority regarding the use of alginate dressings[10]. (Level IV)

Best practice recommendations

- Alginate dressings are recommended in infected, chronic wounds for their absorbency and ability to maintain a moist wound environment. (Grade A)
- As the amount of fluid that a dressing can absorb is limited, alginate dressings may require a further secondary dressing to prevent moisture loss and maintain a bacterial barrier. (Grade A)
- As a temporary measure, alginate dressings are effective in protecting exposed tissue and underlying structures (e.g. tendons and joints) from desiccation during surgical procedures. (Grade B)
- Dressings should be selected on the basis of their conformability, absorbency and ease of removal. (Grade A)
- The amount of time that alginate dressings can remain in situ depends on the product, the wound and the treatment aims. It is advisable to follow the manufacturer's recommendations and use sound clinical judgement. (Grade A)
- It is important to flush all alginate fibres out of the wound at dressing changes as retained fibres can negatively affect wound healing. (Grade B)

NB. Other related topics

ES 3546 Alginate dressing: Burn wounds and donor sites

ES 3459 Silver-releasing alginate dressings for chronically infected wounds

Audit criteria

- The wound is not bleeding excessively prior to the application of the alginate dressing.
- The alginate dressing covers only the area of the wound bed.
- Wound edges are not macerated or dry (suggests that dressing is too large or wound bed not properly cleaned at time of previous dressing).
- No dry eschar is present on the wound (alginates contraindicated).
- Where exudate is excessive, an absorbent dressing has been used.
- The wound is flushed at each dressing change.

References

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