

THE BENEFITS OF RIGID DRESSINGS FOLLOWING LOWER-LIMB AMPUTATION

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Aim

THE AIM of this integrative review was to explore the benefits of using rigid dressings following lower-limb amputation for people with compromised circulation. The research question was: "What are the benefits of using rigid dressings following lower-limb amputation?"

Background

Amputation of a lower limb is usually a last-resort measure, after attempts to salvage the limb to improve circulation and tissue perfusion – such as angioplasty and surgery – have failed (Duwayri et al, 2011; Jones et al, 2013; Moxey et al, 2010). Patients may have had severe ischaemic pain for some time, and analgesia has not been effective in managing it (Melsom & Danjoux, 2011). Tissue loss, such as ulceration, is often present and this may have led to infection in the limb or systemically (Ali et al, 2013). In some cases, infection leads to sepsis and can be life-threatening (Melsom & Danjoux, 2011). People who have amputations due to dysvascular causes tend to be elderly and have multiple co-morbidities, a significant proportion of them with diabetes. Amputation is a last resort when ischaemia had led to pain, tissue loss and infection. The impact of amputation on the person, their family and the wider community is significant. Having a lower-limb amputation has a profound impact on patients and their whānau (Moxey et al, 2010). Pain may be present only in the immediate post-operative period, or more long term (Yoo, 2014). Reduced mobility often leads to changes in the person's living environment, sometimes requiring residential care. Psychological, economic and social effects of lower-limb amputation can require a long period of adjustment, with high rates of depression being common (Sheehan & Gonod, 2014; Yoo, 2014).

Following amputation, a non-adherent dressing is applied directly to the surgical incision site and some kind of secondary dressing is applied over this. The aim is to keep the incision free from infection and to promote skin healing (Latlief et al, 2012). There are two main options commonly used for secondary dressings for patients who have had lower-limb amputations – soft dressings and rigid dressings. Traditional soft dressings are usually crepe or elastic bandaging. Rigid dressings may be made from a range of materials, such as plaster of Paris, fibreglass or plastic, or may be vacuum dressings or other rigid wraparound styles (Schnur & Meier, 2014). Plaster of Paris dressings are not able to be removed and reapplied easily, but the other types generally are. Some hospitals use an immediate post-operative prosthesis (IPOP), which is a type of rigid

cast applied in the operating theatre, which allows a prosthetic device to be fitted to the cast and the patient can be up on two "legs" as early as the day after surgery (Ali et al, 2013).

Methods

An integrative review is the broadest type of review, which summarises literature that can be both quantitative and qualitative for a more comprehensive understanding of a problem. The structured stages of an integrative review include problem formulation, literature search, data evaluation, data analysis and presentation (Whittemore & Knafl, 2005). Databases searched included EbscoHost, ScienceDirect, ProQuest, Pubmed, Elsevier and Researchgate. Search terms used were: amputation, dressing, amput* (which picked up amputee/s, amputations, amputate), lower limb, dysvascular, transtibial, below knee, rigid dressing and rigid removable dressing in varying combinations. The timeframe for the search was 2004 to 2016. From 39 possible primary studies that were screened, 10 were evaluated as meeting the selected criteria for the review. Five studies of these were randomised control trials and a further five were retrospective case analyses.

Finding

Key benefits of the use of rigid dressings in the studies reviewed included reduced time to prosthesis fitting, protection of the wound from trauma, and fewer complications, and that they have a higher degree of acceptability for patients. Use of rigid dressings resulted in a shorter time to the first fitting of a prosthesis, compared to use of soft dressings post-operatively. Van Velzen, Nederhand, Emmelot and Ijzerman (2005) found the average length of time to fitting for those who were given a rigid dressing immediately post-operatively to be 50 days, as opposed to 110 days for those with a soft dressing. Ladenheim, Oberti-Smith and Tablada (2007) also showed significantly shorter times for prosthesis fitting for rigid dressings at 58 days, compared to 84 for soft dressings. Similarly, Sumpio, Shine, Mahler and Sumpio (2013) found the length of time to prosthesis fitting to be 43 days for rigid dressings compared to 75 days for soft dressings. The use of rigid dressings also reduced time for wound healing and was consistent with less stump oedema.

The rigid dressing was found to protect the stump wound from trauma. Patients who have had lower-limb amputations are at high risk for falls, particularly when they first begin to mobilise. Ali et al (2013) reported that the group using rigid dressings had half as many falls and suffered less trauma when falling than patients with soft bandaging. Deutsch et al (2005) reported four patients with rigid dressings in their study had falls, but reported no stump damage, whereas six soft-dressing patients had falls, and three of these patients required revision surgery. Patients with rigid dressings reported more confidence with exercising, as they felt their stump was more protected and they found transferring from one position to another easier.

Complications of lower-limb amputation were also reduced with rigid dressings. Preventing joint contractures is important to enable the patient to be able to use a prosthesis effectively. Some

rigid dressings, such as the IPOP, fit over the knee and keep it positioned in extension, avoiding contractures (Ali et al, 2013). The rigid dressing also forms a conical shape, which is better suited for a prosthesis than bandaging, with less likelihood of “dog ear” skin flaps (pointy pieces of tissue on the end of the stump) (Hidayati et al, 2013).

The rigid dressing had a higher level of acceptability than stump bandaging for both patients and health professionals involved in their care. The majority of patients surveyed post-operatively preferred to continue using the rigid dressing (Woodburn et al, 2004), which may also, according to Ali et al (2013), have some psychological and physiological benefits for patients. A survey of surgeons, nurses and physiotherapists indicated that rigid dressings were an improvement and they would prefer patients to use them. The majority of clinicians were in favour, though some had reservations about the heaviness of plaster casts as opposed to bandaging, and the need for skilled staff to apply them (Woodburn et al).

Conclusions

This review concludes that overall, rigid removable dressings are associated with faster time to first fitting of a prosthesis, faster wound healing and reduced oedema, as well as offering protection to vulnerable stumps. Rigid dressings should be applied immediately post-operatively, which means that skilled staff need to be available to apply them in the operating theatre.

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