Guide to the use of post-operative rigid dressings for transtibial amputations

Introduction

In standards S5 and P1, a rigid dressing has been recommended to be applied to the transtibial amputated limb immediately post-operatively.

The purpose of this guide is to recommend the use of a removable rigid dressing (RRD) in patients who have undergone a transtibial amputation. An RRD is a post-operative dressing used after a below knee amputation to protect and reduce oedema in the residual limb.

Types of Dressings

Following a transtibial amputation, there are two main types of dressings that can be applied: soft or rigid dressings. Both types of dressings are applied with a degree of compression to reduce stump swelling before the first prosthetic fitting.[1] Soft dressings such as elastic or crepe bandages are low cost and easily applied[2] however rigid dressings are reported to offer a number of advantages over soft dressings including greater reduction in swelling, faster wound healing and shorter time to prosthetic fitting.[3, 4]

There are two main types of rigid dressings commonly applied after transtibial amputation: RRD and non-RRD (NRRD):

- **A non-removable rigid dressing (NRRD)** is often a plaster cast dressing that encompasses the knee and ceases midthigh, keeping the knee in extension. It is usually applied in theatre by the surgeon or person who has been suitably trained in the application of NRRD and remains in place for approximately three days after surgery. After the NRRD is removed, it is usually replaced by an RRD.
- **A removable rigid dressing (RRD)** is usually a plaster or synthetic cast dressing that finishes just below the patella and allows the knee to flex. Easily removed, it allows frequent wound inspection and simulates the donning and doffing of a prosthesis. It is applied directly post-operatively (and within 3 days of surgery) by an appropriately qualified person trained in the application of RRDs. This may be a surgeon, physiotherapist, prosthetist, or other suitably trained professional. Once fitted, the RRD should not be removed from the residual limb for longer than 10-minute periods. A delay in the reapplication of the RRD may result in an increase in the residual limb volume and lead to difficulties in reapplying the RRD.
  A sample information sheet for patients and anyone involved in their care regarding removing and re-applying an RRD is in Supplement 1.

RRDs allow the knee to flex and can be easily removed to allow the wound to be observed.[1] They have also been shown to:

- reduce swelling and facilitate wound healing,[5]
- protect the residual limb from possible trauma,[5]
- shape the residual limb in preparation for prosthetic fitting,[3]
- assist with pain control.[3]

There is consensus amongst expert clinicians and professional organisations that rigid dressings are preferred over soft dressings.[6-8] There is the biological rationale that the hard surface of rigid dressings offers a more consistent pressure around the stump which results in a greater reduction in stump volume.[5, 9] In addition, the hard surface also offers greater protection of the stump from trauma.[5, 10] All of these factors are believed to contribute to faster wound healing, reduced risk of wound breakdowns and infections, reduced pain, shorter time to prosthetic fitting, reduced length of stay in the hospital and improved quality of life.[3]

While there are limitations in the existing literature, no study reported safety issues associated with the use of RRDs. Emergent research suggests the use of RRDs are associated with better clinical outcomes for people with transtibial amputation and, as such, it is recommended that RRDs be used in clinical practice.

Evidence

The available evidence suggests that RRDs confer a variety of benefits. As part of the process of updating the amputee care standards, the NSW ACI Amputee group commissioned the Sax institute to conduct a review of the evidence on rigid dressings in transtibial amputations. The full report can be found at **www.saxinstitute.org.au/publications/evidence-check-library/amputee-care-standards/**. Based on this evidence review, five systematic reviews and an additional six primary studies investigating the use of post-operative dressings following transtibial amputation were identified. RRDs were consistently associated with faster wound healing compared to soft dressings,[11] and rates of surgical revision were lower among patients receiving RRDs. RRDs were also consistently associated with equal or faster prosthetic fitting times than soft dressings. RRDs have been associated with a significant reduction in time from amputation to wound healing, initial prosthetic casting (35 in Sax review[12]), and independent walking for individuals with transtibial amputation.

While there are a number of limitations to the existing evidence, including a lack of randomised controlled trials, inconsistent outcome measures, a failure to blind outcome assessors, and a risk of bias in some studies, the emergent research suggests the potential benefits support better clinical outcomes for people with transtibial amputation and as such it is recommended that RRDs be used in clinical practice.

Summary of findings

- There is consensus amongst expert clinicians and professional bodies regarding the use of rigid dressings over soft dressings for transtibial amputations, except where contraindicated.
- Appropriate training of staff is essential for the application of rigid dressings and the ongoing care of the residual limb.
- Training resources to educate staff in the initial fitting of rigid dressings is available through Enable NSW
- Supplement 1 provides a sample information sheet on removing and re-applying an RRD.

Resources

- **Enable NSW patient information** – Removable rigid dressings/rigid casts **www.enable.health.nsw.gov.au/about/publications**

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