A User-Friendly Method of Pin Site Management for External Fixators
Paul Dayton, Dustin B. Prins, Nathan Hensley and Jeffrey Wienke, Jr
Foot Ankle Spec published online 16 September 2011
DOI: 10.1177/1938640011416352

The online version of this article can be found at:
http://fas.sagepub.com/content/early/2011/05/13/1938640011416352

Published by:
SAGE
http://www.sagepublications.com

Additional services and information for Foot & Ankle Specialist can be found at:

Email Alerts: http://fas.sagepub.com/cgi/alerts
Subscriptions: http://fas.sagepub.com/subscriptions
Reprints: http://www.sagepub.com/journalsReprints.nav
Permissions: http://www.sagepub.com/journalsPermissions.nav

>> Version of Record - Sep 16, 2011

What is This?
A User-Friendly Method of Pin Site Management for External Fixators

Abstract: Pin tract inflammation and/or infection are common with the use of external fixation devices. Pin sites need to be managed to help prevent complications. There are a variety of regimens proposed for pin care in the literature. The authors present an efficient and simplified approach for addressing pin care protocol using cord locks with the use of compression sponges for external fixation devices. This method obviates the need for extensive bandaging and makes pin care easy for the patient to carry out. A brief review of the current evidence on pin care is presented, and an evidence-based pin care protocol is presented.

Keywords: complications of external fixator; pin site infection; external pin care

In tract inflammation and/or infection are common with the use of external fixation devices. The rates of pin complications infection range from 0.5%6 to 27.5%.8 To reduce the need for frame revision and pin exchange and to reduce major complications such as osteomyelitis, an efficient and effective pin management system is needed. Literature is clear1,4 that frame stability is the most important factor in pin skin health. Frame design and application are vital to the longevity and success of the external device.3 The goal is to decrease movement between the pin and the soft tissue it passes through. Less movement between the pin and soft tissues means less inflammation. Less inflammation means less infection and fewer revisions.3

A wide variety of daily pin care methods have been proposed in an attempt to limit pin complications.6-10 Good pin care requires a method that is easy to perform so that compliance from the patient and/or nursing staff or care facility is maintained. The pin care protocol we adhere to for our external fixators is based on identification of 6 variables involved in pin site care: (a) clean versus sterile technique, (b) frequency of care, (c) type of cleansing agent, (d) topical medications, (e) approach to crusts, and (f) use of dressings.11-13

A summation of the available outcomes data1-13 suggests the following protocol recommendation for pin care:

1. Pin care starts with stable frame design and application.
2. Normal saline or tap water and mild soap should be the only cleansing agent. The frame is not typically submerged.
3. Pin care is to be carried out daily. The patient cleans the entire frame and the extremity during a shower.
4. Topical agents of any kind should be avoided on the skin and frame.
5. Crusts should be removed when present.
6. Compression dressing should be applied to minimize instability or movement at the wire/skin interface and limit tenting.

Of the components of pin care, bandaging has been the most challenging. Compression of the skin at the pin sites helps stabilize the interface, but the question is how do you fixate or

To reduce the need for frame revision and pin exchange and to reduce major complications such as osteomyelitis, an efficient and effective pin management system is needed.”
adhere the dressing in place against the skin and produce gentle compression to prevent tenting. Grant et al5 used a flat rubber stopper that was 2 cm in diameter in which the gauze sponges were placed between the stopper and the skin and then covered. Paley and Jackson3 used surgical sponges as an alternative to rubber stoppers. The method of pin site management reviewed in this communication is aimed at making daily pin care as easy as possible to improve compliance. With an effective and efficient method to manage the pin and soft tissue interface, fewer complications are expected, and patient satisfaction with external frames is improved.

Our technique is presented as a user-friendly method to stabilize the wire–skin interface to help prevent infection and to increase compliance for proper pin care.

**Technique**

Once the wire is inserted in the desired anatomical position and prior to securing it to the frame and tensioning, one sterilized cord lock is placed on each section of the exposed wire (Figures 1-4). The wire is then secured to the frame and tensioned appropriately. Once the frame is completed and adjusted, 4 × 4 gauze folded in quarters and split is secured against the skin with the cord lock. The cord lock can be rotated 360º on the wire so that it is parallel to the skin surface prior to placing slit gauze. This assures even compression of the skin surface. Cord locks with 9/32 in. hole size work ideally for skinny wires and for 4 and 5 mm half pins. This size also produces enough friction on the wire to hold the gauze under gentle compression but can slide with swelling or changes in position. This feature automatically relieves excess pressure. The patient is instructed to reposition the locks as necessary during the day and change gauze per protocol. The locks are cleansed daily along with the frame during the patient’s shower. The ease of use is a benefit to the patient as frame maintenance is quick and requires very little training.

**Cord Lock Considerations**

The original cord lock was designed in 1969 by Jake Egger and is used originally as the knot alternative. The cord locks we have used are made of high-strength acetyl thermoplastic and seem ideally suited to this application. We have tested several models through cycles of standard steam autoclaving, and the devices are unaffected in appearance and performance. We currently use a model of cord lock with an overall diameter of 5/8 in., a length of 1 3/8 in., and with a 9/32 in. oval hole. We have used this same model for skinny wires and half pins with good success. A benefit of the commonness of the cord lock is that practically everyone is familiar with the device and how to manipulate it. This is especially beneficial when it comes to cleanse the wire insertion sites and replace the gauze. Cord locks are also very economical. We do not endorse any one maker of cord lock.

**Discussion**

Preventing skeletal pin site infection with external fixator pins is a priority. Pin site infections result in poor patient outcomes, osteomyelitis, delayed healing, pain, and prolonged hospitalization. Motion at the insertion site of a wire in an external fixation device is a primary factor in pin site infection and it starts in the operating room. For effective pin site care the keys are to provide a safe and cost-effective process and ensure ease of application; thus, the present application of cord locks for skin immobilization is intended to prevent infection and make...
the cleansing of the wire insertion site easier for the entire medical team.

References


