# Is Silver The Solution To Improved Wound Healing?

Throughout a surgical procedure, patients are at risk for complications. Once a patient has made it through the procedure and the surgical site has been properly closed, the risk for complications still continue. Infection at the site of the surgical wound is among one of the most common and dangerous post-operative complications a patient faces. Proper wound closure and management by the surgical team can reduce the risk for infection and ensure the patient goes home safely and complication-free.

According to Nancy E. Epstein, MD, silver has been used for centuries, possibly even thousands of years, to help prevent infection. Recently, silver-impregnated wound dressings have been developed. These dressings contain slow-release silver compounds/ions used to limit/treat bacterial, yeast and viral-induced wound infections associated with surgery, burns, trauma and ischemia.

To evaluate the effectiveness of silver wound dressings in reducing infection of the surgical wound, Epstein conducted a study that retrospectively analyzed and compared two patient populations undergoing lumbar-instrumented fusions. The first group included 128 patients received routine postoperative dressings (RD) defined by the use of either an iodine or alcohol swab with a dry 4x4 gauze. The second group included 106 patients who received silver dressings (SD). The dressings used were Silverlon dressings, by Argentum.

**Why Silver?**

According to Epstein, silver has been used to prevent infection because “at the microcellular level, silver ions overturn the transmembranous energy metabolism of bacteria, resulting in a dose-related basteriostatic or bactericidal reduction of infection.

In clinical and laboratory settings, silver has effectively treated organisms like MRSA and PA. Silverlon dressings, Epstein says, have demonstrated activity against microorganism within 1 and 2 hour of application, and the same dressings show activity for up to 7 days if properly cleaned once daily with sterile/clean water only.

**The Study and Results**

The patient populations in Epstein’s study all underwent lumbar laminectomies with posterolateral instrumented fusions. As Epstein reports, most other clinical and surgical factors were comparable for both groups—average age, neurologic deficits, number of laminectory/fusion levels, average operative time, hospital stay, rate of reoperation, time to fusion and outcome. All were fused with the same instrumentation.

Postoperatively, the study found that three of the 128 patients who received RD dressings developed deep postoperative wound infections with SA. Comorbidities included diabetes, hypertension, morbid obesity and prior surgery. All infections were successfully without reoperation. Additionally, 11 patients developed superficial wound infection/irritation, all managed with antibiotics.

On the other end, zero of the 106 patients who received the SD developed deep or superficial wound infections.

**Silver May Be The Solution**

According to Epstein, the value of silver and its effectiveness in limiting infection has been known for centuries. More recently, slow-release silver sulfadiazine-impregnated wound dressings have been developed to treat postsurgical and other types of wounds. Three commonly used products include: the Silverlon used in this study, Acticoat by Smith and Nephew and Silvasorb by Medline Industries.

Additionally, previous studies have also reported that SD does in fact play a positive role in reducing wound infections. As Epstein reports, a laboratory study performed by Heggers et al used a Sprague-Dawley rat model for assessing the treatment of burns. They documented that the 3 SD noted earlier equally countered infection, especially those attributed to PA and SA.

Epstein says Thomas and McCubbin also documented the use of different silver dressings to counter infections attributed to gram-positive and gram-negative organism, and yeast. Other studies have found that SD not only limit nomocomial infections/bacterial growth, but also prevent wound adhesions, promote wound healing, reduced pain and limited frequency of dressing changes.

Overall, Epstein concluded that despite small patient population numbers, the research indicated that silver wound dressings may, in fact, help to promote improved wound healing and help prevent infection. More research on larger populations will help to draw more distinct conclusions about how this technology can improve patient care.

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