A history of silver – six millennia in the making

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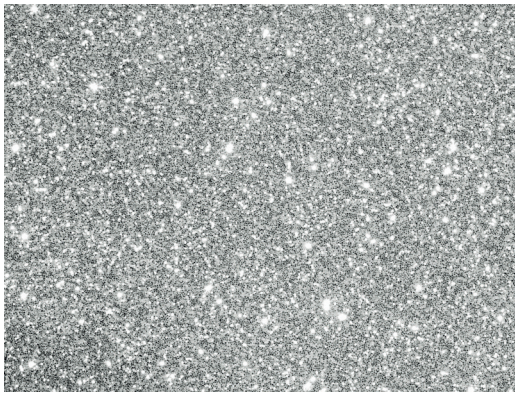
In today's wound care formulary, products containing silver are by now a familiar and commonplace sight. Silver's importance in the prevention and management of wounds is well known, especially as concerns burns care. A search of the current Wound Care Handbook (2018) reveals 56 such topical gels, hydrocolloids, foams, alginates, and other varieties of dressings. But when did silver come to be accepted and exploited so readily? Is it another long-forgotten ancient treatment, revived by modern medicine, à la honey and seaweed (alginates), or a recent discovery, happened upon by the laboratories of modern pharmas?

As so often in this column, the answer is the former. According to Alexander (1999), silver has been used since 4,000 BCE in the prevention and treatment of infection, and prior to the introduction of antibiotics, was "the most important antimicrobial agent available". Alexander points to the silver drinking vessels used by Persian kings, due to their ability to preserve fresh water. Despite these astounding early discoveries, there again exists something of an archival blackhole in the following millennia, with little mention of silver until the middle ages, wherein the invention of silver nitrate occurred, and its subsequent use on chronic wounds and ulcers, amongst other maladies (Klasen, 1999). It seems to have been used in a hardened, solid form, directly on the wound, and been known in the Latin, French, and German of the time as a translation of 'infernal stone' — as Klasen observes, likely due to the intense pain involved during treatment.

As one of the few surgeons in the 1800s to practice with antiseptic techniques, William Stewart Halsted's use of silver foil dressings on infected wounds some 100+ years ago perhaps marks the first use of silver in a dressing format (Mouës et al, 2009; Abboud, 2017), a practice maintained until the dawn of antibiotics around the time of WWII, upon which it fell from favour. Its re-emergence was thanks to studies conducted by two oft-cited names in the 1960s: work by Moyer in 1965 demonstrated its antibacterial efficacy in burns care (Moyer, 1965). This was soon followed by Fox's introduction of silver sulphadiazine (SSD) in 1968, which combined silver with sulphonamide, thus creating a safer broad-spectrum antiseptic than the iodophores that preceded them (Fox 1968, Mouës et al, 2009). Its safety compared to the early formulations of povidone and iodine of course is a relative comparison; whilst the iodine preparations were accompanied by skin irritation, discolouration, and potential toxicity, early silver nitrate use suffered from the same ill-effects. SSD of course remains in use today, with six products in the 2018 Wound Care Handbook, each accompanied by stern warnings concerning the potential side effects of sulphonamides.



Silver has been demonstrated to have anti-microbial effects and can be a useful in treating infected wounds

Today, silver dressings are an accepted means of tackling infected and/or malodorous wounds, often when combined with activated charcoal (White, 2013), though perhaps without the due forethought and application as are given to use of antibiotics. It has been recently observed that antiseptic use lacks the industry-wide guidelines and evidence as applied to other antimicrobials – it is down to the individual physician to utilise "the right antiseptics at the right concentrations to treat the right wounds" (Roberts and Leaper, 2017). In an age of increasing antibiotic resistance, perhaps it is time for the international wound care community to formally categorise clinical effectiveness of silver. It will only have taken 6,000 years, but if it limits use of antibiotics to where they are really needed, it might just be worth it. WUK