The following case study presents one patient’s experience with treatment of a chronic lower-extremity wound using a tea tree oil (Melaleuca alternifolia) mixture applied topically. JC is an 85-year-old man with a history of more than 70 years smoking cigarettes. Prior to 2006, he had no cardiology issues and no diabetes but did have a mild case of chronic obstructive pulmonary disease. He had osteoarthritis in both knees and had difficulty walking but enjoyed using his walking lawn mower, which provided some aerobic exercise. He mowed his own and several neighbors’ lawns, and this kept him active 2 to 3 hours per day during the summer months. During the winter, he lived in Arizona and golfed 3 days per week.

An x-ray in February 2006 showed an aneurism behind JC’s left knee. The aneurism ruptured in May 2006. Surgeons successfully performed arterial grafts at this time. In late November 2007, he reported foot pain and a nonhealing sore on his left foot. On December 17, 2007, he was admitted to the hospital and had a below-the-knee amputation of his left leg. He was discharged 10 days later and was directly admitted to a long-term care facility where he continues to reside.

The surgical incision site on the stump initially appeared to be healing well, but by February 2008, it was noted that two medial nickel-sized areas were not healing. The wounds were approximately 2 cm deep. According to the medical record, there was no apparent odor or other signs of infection. Wound culture was not performed. JC’s physician ordered wound care, which consisted of cleaning and packing the wounds with gauze strips. In March 2008, the surgeon who performed the amputation declared that another surgery to amputate an additional 2 to 3 inches of the leg, including the knee, would be necessary.

JC wished to avoid another surgery because he had not responded well to the narcotic from the first surgery. He had become disoriented and angry and was diagnosed with hospital psychosis. Based on the experience of his daughter (the first author of this case report), who was JC’s primary health care advocate, and also based on a review of the literature, an academic colleague (second author of this case report) with essential oils research and teaching experience suggested applying a 7%-to-10% solution of tea tree oil in a carrier oil as an alternative wound treatment that could potentially heal the wounds and delay or prevent another surgery. The authors obtained organic tea tree oil from a local retail company, Intelligent Nutrients, and mixed it with organic pumpkin seed oil. The solution was prepared at approximately 10% tea tree oil to 90% pumpkin seed oil. The surgeon agreed to the plan and wrote wound care orders in March 2008 to include this mixture.

Nurses at the long-term care facility where the patient resided provided the wound care. Care consisted of soaking gauze strips in the tea tree oil/pumpkin seed oil mixture and then packing the wounds with the soaked strips on a daily basis after rinsing the wound. The wound began a slow healing trajectory after the treatment was started. On May 21, 2008, JC returned to the surgeon, who noted significant decrease in the depth and size of the wounds although they were still present. In August 2008, the surgeon discontinued tea tree oil treatments and stated that surgery would not be necessary, although some redness at the former wound sites remained. Soon afterward, JC’s physician declared the wounds to be completely healed. JC has experienced no subsequent lower extremity wound episodes to date.

Although JC was not diabetic, this case illustrates a common wound trajectory among diabetic patients: a nonhealing foot ulcer progressing to lower extremity amputation and the possibility of subsequent surgical interventions. Before treatment with the tea tree oil solution, the surgeon stated that the likelihood of the wound healing was minimal, but it is unknown whether the wounds would have healed without the treatment. Furthermore, it is not known what possible role the pumpkin seed oil carrier may have played in the healing process, independently or synergistically. The fact that JC’s wound healed with the aid of a tea tree oil and pumpkin seed oil topical application does not prove that such a treatment is effective, but it does suggest further exploration of this and similar botanical wound treatments.

DISCUSSION AND FUTURE DIRECTIONS

Chronic wounds can seriously compromise the health of both diabetic and nondiabetic patients. Difficult-to-heal wounds
Tea Tree Oil for Chronic Wound Treatment

also can have a profound effect upon patients’ quality of life, as illustrated by this case study, and they can add to health care costs. There are some potential challenges in conducting this type of research in a clinical trial. Blinding is difficult in studies of essential oils because they are volatile, odorous compounds. Lack of proper blinding could skew any estimate of treatment effects. Recruitment, attrition, and compliance will be challenging in this patient population. Finally, the length of time that the wound has been present would need to be carefully considered, particularly in a population where a chronic wound can quickly lead to amputation.

During the past 30 years, many studies have examined the efficacy of *M. alternifolia* (tea tree oil) plant essential oil against a variety of pathogenic bacteria. Findings of in vitro studies suggest that many *Staphylococcus aureus* isolates (MRSA and MSSA) are susceptible to tea tree oil in low concentrations, and the results of small human trials suggest that it may be effective as an adjunct topical wound therapy. Combined, the in vitro and in vivo studies conducted and published to date present a compelling rationale for testing the efficacy of tea tree oil in both chronic and acute wounds. The research knowledge generated also would be foundational for other researchers to develop novel wound care strategies using essential oils and other botanicals.

REFERENCES