뜸치료에 의한 화상으로 발생한 당뇨족 및 연부조직 괴사

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Diabetic Foot and Soft Tissue Necrosis Caused by Moxibustion Burn Injury

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A 72-year-old man with diabetes, who underwent moxibustion, developed a foot wound but did not receive proper treatment. Examination showed a soft tissue defect (6×6 cm) on the dorsal aspect of the right foot with involvement of the first and second toes along with some phalangeal bone loss. The wound was treated with a skin graft and healed without complications. The right calf showed a raw surface (4×3 cm), which underwent epithelialization after conservative treatment. We observed four focal necrotic lesions (1.5×1.5 cm) on the right lower leg and anterior chest, which served as indicators of moxibustion, and debridement and primary closure were performed. Moxibustion is increasingly used as a therapeutic option; however, statistical data describing its adverse effects are limited. Moxibustion significantly increases skin temperature and can cause burn injuries. It is important to prevent moxibustion-induced adverse effects and avoid severe complications, particularly in patients with diabetes. (*J Korean Burn Soc* 2020;23:60-63)

Key Words: Moxibustion, Burn, Diabetic foot

INTRODUCTION

Moxibustion is an ancient method of external therapy based on the theory of traditional Chinese medicine. This treatment, which includes several methods, involves the stimulation of acupoints by burning moxa wool. Traditional moxibustion is a form of heat therapy characterized by the burning of dried plant materials called moxa on or near the skin surface. Moxibustion is classified into direct (moxa placed directly on the skin and ignited) and indirect (moxa placed at some distance from the skin) types [1].

Many Oriental physicians and unlicensed medical prac-

titioners advocate moxibustion for the treatment of several diseases, and this therapy is widely used in routine practice. Adverse effects resulting from various techniques used in Oriental medicine are occasionally encountered in medical practice; however, there is lack of systematic statistical data regarding such complications. We report a case of moxibustion-induced tissue necrosis of the lower extremity and chest in a patient with diabetes. We emphasize that moxibustion therapy warrants extreme caution in this group of patients.

CASE REPORT

A 72-year-old man was diagnosed with diabetes one year prior to presentation and was admitted to the endocrinology department of our hospital for insulin therapy to control his blood glucose levels. He denied any specific medical history except hypertension. He underwent consultation with the department of plastic and reconstructive surgery. The patient reported receiving moxibustion

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Fig. 1. Photographs showing foot and leg wounds secondary to moxibustion treatment. (A) A defect measuring 6×6 cm is observed on the distal aspect of the right foot. The arrow shows a focal necrotic lesion measuring 1.5×1.5 cm in size. (B) A close-up view showing the lesion with non-viable debris. (C) A raw area measuring 4×3 cm is observed on the right calf. (D) Radiograph showing bone defects in the distal and proximal phalangeal and metatarsal bones of the first toe and the distal and middle phalangeal bones of the second toe.

Fig. 2. Computed tomography (CT) angiography of the lower extremities. Multifocal arterial stenosis of both low extremities was observed. Stenosis is more prominent in the arteries below the knee. The left posterior tibial artery and the both dorsalis pedis artery were poorly visualized.

treatment 8 months earlier and developed a foot wound for which he did not receive proper treatment.

Examination showed an area of skin and soft tissue necrosis (6×6 cm) on the dorsal and distal aspect of the right foot along with involvement of the first and second toes. We also observed three other lesions (1.5×1.5 cm) with focal necrosis on the right lower leg and one lesion on the right anterior chest. The right calf also showed a raw surface (4×3 cm). Foot radiography revealed some loss of the phalangeal bone of the first and second toes (Fig. 1).

Fig. 3. Photographs showing moxibustion-induced wounds after debridement. (A) A wound observed on the distal aspect of the right foot after removal of the necrotic tissue. (B) Right calf wound after necrotic tissue removal.

Computed tomography (CT) angiography of the lower extremities was performed to evaluate vascular status using a 320-slice CT scanner (Aquilion ONE; Toshiba Medical Systems, Tokyo, Japan). Multifocal stenosis of the lower extremities arteries was observed, more prominently in the arteries below the knee (Fig. 2). Debridement was performed under local anesthesia until fresh bleeding was observed (Fig. 3). The bone defect site was filled with granulation tissue, and there was no bone exposed area. Kirschner-wire was inserted from the unstable 1st and 2nd toe tip to the metatarsal area to reduce the instability caused by bone defects. We performed debridement and primary closure of four lesions of focal necrosis; all le-

Fig. 4. Photographs showing good wound healing without complications. (A) Image obtained 10 days after the application of a split-thickness skin graft showing the graft has taken well. (B) The defect in the right calf was treated with conservative management, and successful epithelialization is observed.

sions healed without complications, and sutures were removed 2 weeks later. The patient received conservative treatment for 1 month and showed growth of granulation tissue that covered the raw surface. A split-thickness skin graft was performed on the right foot wound under spinal anesthesia. We observed rapid epithelialization of the right calf wound, and we chose healing by secondary intention. The surgical site healed without complications, and the right calf wound was completely epithelialized (Fig. 4).

DISCUSSION

Moxibustion is widely used in clinical practice; 67% of Korean Oriental medical practitioners use this therapy. Traditional Chinese medicine accounts for 40% of health care delivered in China, and moxibustion is being increasingly performed even in Western countries [2]. As moxa treatment continues to be widely accepted, it is doubtful that side effects caused by moxa will occur. However, limited official statistical data are currently available with regard to moxibustion treatment. A systematic review that included 64 cases of adverse events reported that burns comprised the most common adverse events (43 cases), followed by allergies (7 cases), infection (6 cases), nausea or vomiting (2 cases), fetal harm (2 cases), and cough, basal cell carcinoma, ectropion, and death (1 case

each) [1]. Most patients with burns healed with conservative treatment alone. However, in the current study, the patient's wounds were more severe than those reported by previous studies, with a large soft tissue defect and loss of the phalangeal bones, necessitating surgical treatment. There are systematic reviews that claim that moxibustion treatment is safe [1,2], but there are studies that mention that the quality of the reviewed studies is poor and that it is difficult to conclude [3]. Therefore, to prove the safety of moxibustion treatment, a well-designed study with a large sample should be additionally conducted.

According to the theory of traditional Chinese medicine, moxibustion has a dual effect of tonification and purgation. It is based on the actions of the meridian system and the roles of moxa and fire. Modern research has shown that the underlying mechanisms of moxibustion include thermal and radiation effects associated with this practice and the pharmacological actions of moxa and its combustion products [4]. Contact burns may occur secondary to thermal effects associated with moxibustion. The combustion temperature of moxa could be as high as 548~890°C without a flame [5]. Experiments performed in a mouse model have shown that direct moxibustion can be associated with a temperature of 130°C outside the skin and 56°C inside the skin [6]. This temperature can cause contact burns. Especially in patients with diabetes, peripheral neuropathy, foot trauma, foot deformity, foot edema, and callus formation can collectively result in diabetic foot ulceration [7]. Therefore, moxibustion therapy can predispose patients with diabetes to diabetic foot ulceration.

Many studies are being conducted to prove the effectiveness of moxibustion treatment. Although the conclusions are different for each systematic review, many reviews point out that the quality of the studies is low and the controls are inadequate [3,8]. There are systematic reviews that moxibustion therapy is more effective than medication in ulcerative colitis [3], but other reviews say that the effectiveness of moxibustion therapy cannot be documented due to poor study quality [8]. In Breech presentations, the overall result seems positive (contemp 8), but there are opinions that the results are inconclusive due to the heterogeneity of the studies [3]. In addition, there have been various studies on myofascial pain syn-

drome, knee osteoarthritis, ankylosing spondylitis, Leukopenia induced by chemotherapy, diabetes, hyperlipidemia, diabetic peripheral neuropathy, Parkinson's disease, vertigo, diarrhea and rheumatoid arthritis, but no definite conclusion about the effect cannot be drawn [3].

Moxibustion or other folk remedies are known to cause adverse events; however, few cases have been reported in the available literature. Although Oriental medical practitioners claim that moxibustion treatment is safe, this therapy can cause severe complications, including soft tissue necrosis, bone loss, and diabetic foot ulcers, as observed in our patient. Therefore, moxibustion therapy warrants extreme caution and should be performed in a controlled manner, particularly in patients with diabetes to avoid severe complications.

DECLARATIONS

No funding was received. Written informed consent was obtained from the patient for the publication of any data/associated images. The study was approved by the Institutional Review Board of Konkuk university chung-ju hospital and performed in accordance with the principles of the Declaration of Helsinki.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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