

# POSTOPERATIVE ALLERGIC CONTACT DERMATITIS TO TINCTURE OF BENZOIN AND GUM MASTIC: Podiatric Case Reports

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Allergic contact reactions to tincture of benzoin, USP and gum mastic (Mastisol: Ferndale Laboratories, Ferndale, MI) are rare occurrences that may be misdiagnosed as post-operative wound infections. Wound adhesives like tincture of benzoin and mastisol are often used to augment the surgical strips used to create a negligible fine postoperative scar. Allergic contact dermatitis to benzoin is well defined in the dermatologic literature, but Mastisol-induced contact dermatitis is less described and considered exceptionally rare. Interestingly, no reports are noted within the podiatric literature despite the sometimes routine use of these wound adhesives in podiatric surgery. Therefore, this paper serves to present three case reports of allergic contact dermatitis due to wound adhesives occurring in the senior author's private practice within a two-year period.

## BACKGROUND

The first recorded case within the literature of benzoin sensitivity was 1874 by Tilbury Fox in a patient inhaling a benzoin-containing vapor.<sup>1</sup> Since then, there have been several case reports of local contact dermatitis to various areas of skin application, especially when applied under occlusion.<sup>2-10</sup> However, it is well documented that allergic contact dermatitis to tincture of benzoin is rare especially taking into account its common use. Of note, two more recent studies have concentrated on comparing gum mastic (Mastisol) and tincture of benzoin. James et al. demonstrated a 0.3% incidence (16/4500 individuals) of allergic contact dermatitis in those exposed to tincture of benzoin with 3 individuals developing a generalized exanthem compared to no recorded Mastisol-induced allergic reactions in the same population. Importantly, patch-testing revealed that once an individual is primary sensitized to tincture of benzoin, cross reaction to Mastisol usually occurs. The authors concluded that this was most likely secondary to the common ingredient of styrax gum.<sup>6</sup> Lesesne compared the adhesiveness with Steri Strips (Minnesota Mfctr Co, MN) and incidence of

contact dermatitis with gum mastic versus tincture of benzoin in 300 patients undergoing plastic surgical procedures. The author reported that gum mastic had superior adhesiveness and that 57 benzoin patients and 1 gum mastic patient developed temporary contact dermatitis with consequent skin discoloration.<sup>4</sup> This paper now adds three case reports of allergic contact dermatitis with the use of these wound adhesives.

## CASE REPORT 1

A 55 year-old black female returned two weeks after bunion hardware removal and fibular sesamoidectomy by the principal author with a spongiform confluent vesicular dermatitis geometrically aligned with the application of tincture of benzoin that encompassed the dorsal left first ray (Figure 1). No erythema, drainage, dehiscence, or any other clinical signs of infection were noted. Additionally, the patient had pruritic welts on her abdomen, arms, and lower back. The tincture of benzoin had been applied at the end of the surgical procedure to increase the Steri-strips' adhesiveness for enhanced wound closure. The patient related no known drug or food allergies, any prior contact allergic reactions, or changes in medications. Her post-operative week one visit had been unimpressive. Her medical history was significant for multiple surgical procedures including bilateral bunion repair one year prior by a different surgeon. It is unknown whether that physician had used tincture of benzoin during his surgical procedure. Treatment consisted of debridement and Silvadene cream/Adaptic dressing application that day. Daily Domeboro soaks, dressing changes, and antihistamine therapy were prescribed and the reaction quickly resolved without incident (Figure 2). Patch testing of Betadine and steri-strips were non-reactive. Of interest, the patient underwent the identical surgery on her contralateral first ray without the application of a wound adhesive seven months after the left foot surgery and experienced no post-operative complications.



Figure 1.

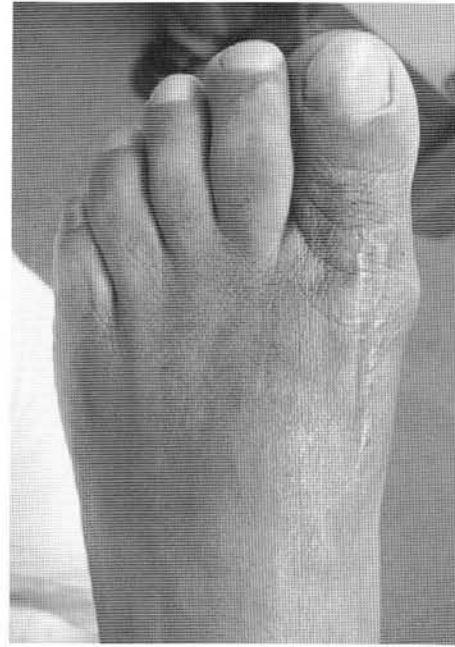


Figure 2.



Figure 3.



Figure 4.

## CASE REPORT 2

A 55 year-old white male underwent collapsing pes planovalgus repair of the left foot and was re-examined two weeks post-operatively with subepidermal bullae and serous drainage geometrically aligned about the medial incision and arch (Figure 3). No signs of infection other than minimal edema were present. Several pruritic welts on his chest and underarm were also recorded. There were no known allergies or changes in medications and his first post-operative visit one week after surgery had been unremarkable. The patient had the same procedure performed on his right foot four months prior with no

complications. However, tincture of benzoin had not been utilized in this previous surgery. Local wound care consisting of debridement of the incision line with application of Silvadene cream and a compression dressing was performed. The patient was to continue the Silvadene and compression dressings daily after soaking his left foot in Domeboro solution. Antihistamine therapy was also prescribed. The next day the patient complained of increasing rash and pruritic symptoms with the antihistamine only providing minimal relief. Therefore, the patient was given a short tapering course of methylprednisolone for three days. The reaction resolved within a week of the prescribed course (Figure 4).



Figure 5.

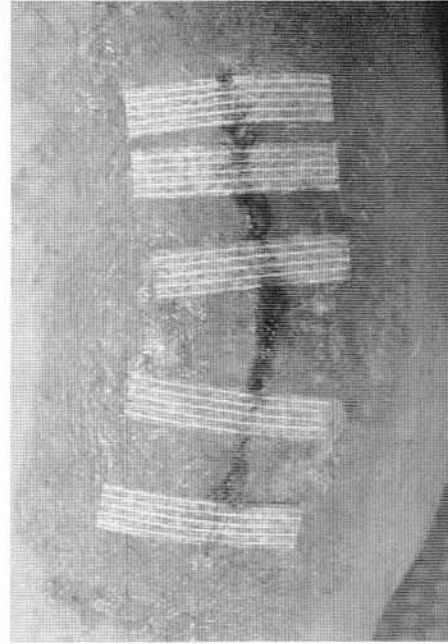


Figure 6.

### CASE REPORT 3

A 13 year-old white male re-visited the office one week after right ankle arthroplasty with the incisions well-coapted and localized erythema around the Mastisol application site with no significant reaction or clinical signs of infection. Two days after this initial visit the patient returned with a superficial erythematous vesicular eruption consistent with the skin area of Mastisol application at the end of this surgical procedure (Figure 5). No dehiscence or signs of infection were noted. The patient related no known drug or food allergies and his past medical history was significant only for prior right ankle arthroplasty and bunion correction approximately two and a half years prior. Tincture of benzoin had not been used in the prior foot surgery. Treatment consisted of incision line cleansing and debridement, application of AmLactin lotion, and a compression dressing. The patient returned one week later with the contact dermatitis wound breakdown resolved.

### DISCUSSION

Allergic contact dermatitis reactions are a type of cell-mediated hypersensitivity immune reaction that require a primary sensitizing event by the offending compound or similar cross-reacting compounds.<sup>11</sup> Antigenic-induced primary sensitization is an unusual event most commonly

expressed 7 to 10 days in an individual previously unsensitized to the allergen. However, a patient with a history of prior sensitization will clinically manifest the reaction from 12-48 hours after exposure.<sup>10</sup> There are two widely used topical forms of benzoin. Tincture of benzoin is composed of 10% styrax benzoin resin dissolved in alcohol. The balsamic resin is extracted from the benzoin tree in Malaysia, Sumatra, Thailand, Borneo, and Java. Adding storax, tolu balsam, and aloe creates compound tincture of benzoin, which is the form that the podiatrist most often uses as a wound adhesive. Benzoin is a common ingredient in a variety of products including herbal medications, hair lacquer, Arning's tincture, greasepaint, rose water, nail polish, creams, cosmetics, lozenges, and expectorants. Mastisol combines mastic and styrax gums with ethanol and is reported to be 7-8 times more adhesive than tincture of benzoin. Any benzoin containing product can sensitize the patient to not only tincture of benzoin, but also to mastisol due, most likely, to styrax gum being an ingredient common to both.<sup>6</sup> Tincture of benzoin also has known cross reactions with Balsam of Peru, storax, eugenol, vanilla, alphapinene, benzyl alcohol, and benzyl cinnamate.<sup>12</sup> Therefore, there are many varied potential offending agents other than application of a wound adhesive that may sensitize the individual's immune system.

These case reports are not meant to promote discontinuance of the use of wound adhesives. Primary sensitization to tincture of benzoin is still considered rare

and mastisol sensitization is considered highly unusual. Mastisol may then be considered a superior wound adhesive since it is known to be 7-8 times more adhesive as well as it is less likely to cause a contact dermatitis.<sup>4,6</sup> However, remember that once sensitized to benzoin the individual may also become allergic to Mastisol as previously described.<sup>6</sup> Therefore, it is recommended that these products be avoided with any patient has had a known reaction to benzoin or products with cross-reacting allergens such as gum mastic. Of note, wound adhesives such as tincture of benzoin and Mastisol are often applied under occlusion in a moist and warm environment around surgically traumatized skin, a situation conducive to causing a contact dermatitis. Clinically, the patient will present with pruritis, geometrically aligned erythema, vesicles, or bullae, and rarely a generalized exanthem depending on the body's intensity of response to the allergen.<sup>11</sup> It is important for the physician to recognize that this dermatitis is not an infection and with local wound care, antihistamine therapy, and rare use of a short tapering course of systemic corticosteroids quick resolution should occur. Patch-testing may be indicated if there is any question of the sensitizing compound. Additionally, the patient should be counseled to avoid any products that may contain benzoin or gum mastic as well as those products with possible cross-reacting allergens.

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