

Contact dermatitis to PPD rubber in Maleki shoes

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The Persian cloth shoe (*Maleki*) which has been in use for more than 800 years has a strong cloth sole and a woven cotton upper. In the last 20 years, used car tyres have become readily available in Iran and the soles of some shoes are now made from these. A man with the typical picture of rubber dermatitis on the soles of his feet is described. On patch testing he gave a 2+ positive to PPD rubber and this was thought to be due to the fact that he had worn *Maleki* shoes for several years.

Key words: 4-isopropyl-amino-diphenylamine – Maleki shoes – rubber tyre dermatitis – shoe dermatitis.

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The Persian cloth shoe, or *Maleki*, is completely different from the western type of shoe (Fig. 1). The making of such shoes has been a traditional Persian craft since at least A.D. 1105 (Wulff 1966). They are made in three separate stages. Firstly, the uppers (*ru'eh chidan*) are made by village women in their homes by sewing a strong, twined thread (*nakh*) with a heavy needle (*suzan-e-giveh-bafi*) in a kind of blanket stitch. Secondly, the soles are made by the *takht-kash* from strips of strong cotton rags (*kohne*) which are sized in a solution of gum tragacanth (*katirah*), joined together with leather strips and cut to shape. Lastly, the shoemaker (*maleki-duz*) joins the two pieces together by first sewing a strong, hide welt to the sole and then sewing the upper to the welt. The overhanging edges of the welt are turned over the toe of the shoe and sewn together and onto the upper and at the back to the upper above the heel. There are better quality shoes in which the uppers are made of fine cotton twine, often patterned or dyed

with various plant dyes, and which are lined by cotton cloth and have a leather heel lining.

Since the 1950s when the motor car came to Iran, there has been an almost unlimited supply of used car tyres and the shoemakers have used these in preference to the traditional cloth soles for making *Maleki*. The shoes that are still made with the cloth soles are called *Maleki shiveh*. Used lorry tyres are bought in bulk from a garage (Fig. 2), cut in half and the worn part removed. One prepared tyre, at a cost of 100 rials (approximately 75p) provides enough rubber for the soles of eight pairs of shoes. The shapes are cut out by one man who then sells them to the *maleki-duz* for about 20p per pair. He then sews a leather welt to the sole and the upper to the welt as in previous times. Such shoes are ideally suited to the hot, dry climate and rough roads and are not only comfortable to wear but extremely cheap.

Rubber dermatitis from shoes has usually



Fig. 1. Maleki-duz cutting up leather strips for joining the soles to the uppers. Several finished *Maleki* are in the foreground.

been caused by the accelerators mercepto-benzthiazole and tetramethyl thiuram disulphide (Cronin 1966). If rubber tyres are

used for making the soles of shoes, it might be expected that dermatitis to paraphenylene diamine (PPD) derivatives in rubber would be the cause. Such a case is described.

Case Report

A 58-year-old carpenter from a village near Shiraz, who had worn *Maleki* shoes for many years, complained of a rash on both soles for 2 years. Examination revealed a bilaterally symmetrical eczematous eruption on the weight-bearing areas of the soles, sparing the insteps. Patch testing with the routine battery of patch tests and to the rubber sole of his shoes showed a 2+ positive to PPD rubber and a $\pm$ reaction to his own soles. The individual components of PPD rubber were not available for patch testing at the time.

In the last year three other patients with an identical clinical picture have been seen. They all wore *Maleki* shoes but all had completely negative patch tests.

Comment

4-isopropyl-amino-diphenylamine is commonly used in the rubber industry as an



Fig. 2. Used car tyres outside shoemaker's shop waiting to be cut to shape for the soles of *Maleki* shoes.

antioxidant and antiozonant. It is incorporated into the rubber used in tyres, rubber belting and other heavy-duty rubber goods. It is a common cause of hand dermatitis in the rubber tyre industry and has been described as causing foot eczema from rubber boots (Vollum & Marten 1968) and contact dermatitis from elasticated underwear in Bulgaria (Batschvarov & Minkov 1968). In Iran, where more than half the population wear shoes which have cut-up rubber tyres for their soles, shoe dermatitis from this substance should be common. This is the first report of such a case but doubtless many others will follow.

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