

Case Report

Chronic arsenic poisoning: a woman with multiple Bowen's disease and palmoplantar keratosis

慢性砷中毒：有多發性博文氏病及掌蹠角化的女患者

JTHT Yu 余浩德 and WY Lam 林偉業

A 62-year-old Chinese lady presented with non-itchy, asymptomatic scaly plaques on trunks and limbs for eight years together with palmoplantar keratosis. She was treated with Chinese proprietary medicine for asthma 30 years ago. A diagnosis of multiple Bowen's disease with arsenic keratosis was made based on clinicopathological findings. Regular follow-up will be given to detect any cutaneous malignant changes.

62歲華人女患者近八年來出現四肢及軀幹的無症狀性斑塊以及掌蹠角化。患者於30年前曾接受中藥治療哮喘。根據其臨床及病理表現而診斷為多發性博文氏病及砷角化病。患者將接受長期隨診以檢查皮膚上可能出現的惡變。

Keywords: Arsenic keratosis, Arsenic poisoning, Bowen's disease

關鍵詞： 砷角化病，砷中毒，博文氏病

Introduction

Inorganic arsenic can cause both acute and chronic dermatitis. Arsenical keratoses, Bowen's disease, squamous cell carcinoma (SCC),

pigmentary anomalies and basal cell carcinoma (BCC) account for the majority of cutaneous lesions related to chronic arsenicism.¹

Case report

A 62-year-old Chinese lady presented with non-itchy scaly plaques on trunks and limbs for eight years. These plaques were asymptomatic and had been slowly increasing in size. The patient also complained of multiple callosities on her palms and soles. She had a history of Type 2 diabetes, hypertension and hyperlipidaemia. Her regular medications include lisinopril, metformin, glibenclamide and salbutamol inhaler. The patient

Social Hygiene Service, Department of Health, Hong Kong

JTHT Yu, BM, BCh(Oxon), MRCP(UK)

Histopathology and Cytology Laboratory, Public Health Laboratory Centre, Hong Kong

WY Lam, MBChB, MHKCPATH

Correspondence to: Dr. JTHT Yu

Yau Ma Tei Dermatology Clinic, 12/F, Yau Ma Tei Specialist Clinic, 143 Battery Street, Kowloon, Hong Kong

had not taken any herbal medications recently but had been treated by Chinese herbalist in the 1970s for asthma. The patient was born in Hong Kong. She did not drink any well water or eat canned fish regularly. There was no significant family history.

Physical examination showed multiple brown scaly plaques on the trunk, arms and thigh around two to three centimetres in size. These plaques were well defined with fine adherent scales (Figures 1 & 2). The extensor surface of the elbows and knees were not affected. The scalp and nails were normal. On the palms and soles, there were more than 50 hyperkeratotic papules on both palms and soles (Figure 3). No ulceration was seen. A few hypopigmented macules were seen on the leg of this patient but there was no classical "raindrop" hypopigmentation. Given a past history of Chinese herbal medicine intake, a clinical diagnosis of multiple Bowen's disease with arsenic keratosis was made.

Investigations including biochemistry and complete blood picture were unremarkable. Screening for internal malignancy was also



Figure 1. Asymmetrical well-defined plaques with rough adherent scale over the trunk.



Figure 2. Keratotic lesions on the soles.



Figure 3. Hyperkeratotic scaly irregular papule on left middle finger.

performed and they were negative. Spot urine for arsenic was normal after abstaining from seafood for one week. In addition, skin biopsies had been taken from the arms and trunk. They both showed dysplastic squamous cell with hyperchromatic nuclei, a high nuclear cytoplasmic ratio and prominent nucleoli with overlying parakeratosis on the epidermis which was consistent with a diagnosis of Bowen's disease (Figures 4 & 5). The lesions of Bowen's disease on the patient were

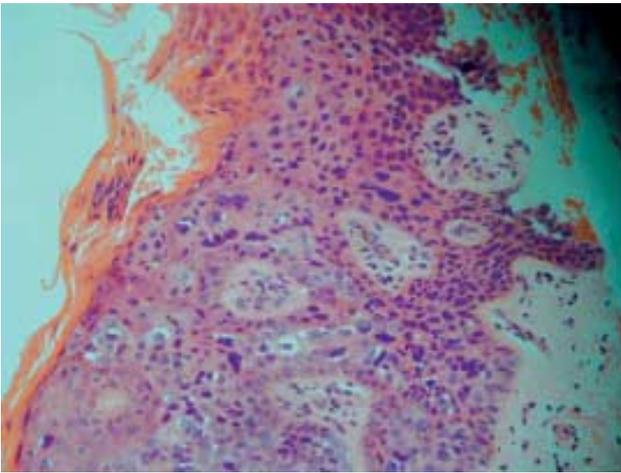


Figure 4. Epidermis showing parakeratosis with marked dysplasia (H & E, Original magnification x 20).

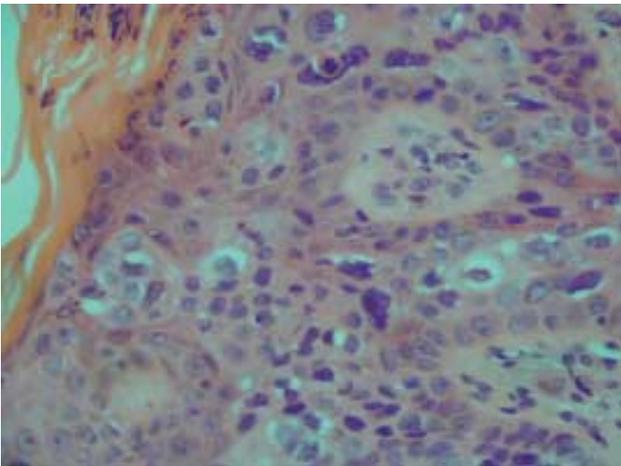


Figure 5. A higher power view showing irregular, hyperchromatic nuclei and coarse chromatin (H & E, Original magnification x 40).

treated with cryosurgery and regular follow-up will be given to detect any evolving malignant changes.

Discussion

Arsenic-induced skin tumours are infrequently seen in Hong Kong although the true incidence

in the community is unknown. Fowler first introduced medicinal arsenic in 1786.² Skin lesions occurring after the treatment of asthma with inorganic arsenic was reported in the United States in 1952³ and among Indians.⁴ Chronic arsenicism from Chinese proprietary medicines was well documented in Singapore.¹ Other potential sources include contaminated well water and food.

Signs of chronic arsenic intoxication include Bowen's disease, BCC and SCC. Squamous cell carcinomas may occur from pre-existing keratotic lesions, Bowen's disease, or may arise de novo. Other cutaneous manifestations include hyperkeratosis of the palms and soles and focal 'raindrop' pigmentation.¹ There is an increased risk of some internal malignancies, mainly of the liver and lung but also of the bone marrow, gastrointestinal tract and kidney. Visceral malignancies usually develop after the onset of skin tumours. The latency period for the development of arsenical keratoses, Bowen's disease, and SCC is in the region of 25-40 years.¹ Long term follow-up is therefore necessary for tumour detection.

The diagnosis of chronic arsenicism is usually based on relevant clinic findings together with a history of exposure to arsenic. Laboratory confirmation of the diagnosis is often not possible due to the long latency period for the development of arsenical keratoses and Bowen's disease. Arsenic level in urine is only useful for acute exposure. There are a number of potential mechanisms for the pathogenesis of arsenic-induced Bowen's disease, including the development of p53 mutations,⁵ defective cell-mediated immune function due to impaired interleukin-2 receptor expression in lymphocytes and the generation of reactive oxygen species.⁶ However, the exact aetiology is unknown.

Treatment of chronic arsenic poisoning is far from satisfactory. Chelating agents have been used clinically as antidotes in acute poisoning and they are organic compounds capable of linking together metal ions to form complex ring-like structures. These complexes are easily eliminated from the body through the excretory system and showed low toxicity. Meso 2, 3-dimercaptosuccinic acid (DMSA) has been tried successfully in animals as well as in a few cases of human arsenic poisoning. DMSA could be a safe and effective method for treating arsenic poisoning, but one of the major disadvantages of chelation with DMSA has been its inability to remove arsenic from the intracellular sites because of its lipophobic nature. Furthermore, it does not provide protection in terms of clinical or biochemical recovery.⁷

Retinoids have been used in the treatment and prevention of a variety of cutaneous malignancies.⁸ Several case reports^{9,10} had shown that acitretin was effective in the treatment of Bowen's disease and palmoplantar keratosis due to arsenic poisoning but they were limited by the side effects of retinoids. e.g. cheilitis, myalgia, alopecia etc. Therefore, regular long-term examination and follow-up is more important for early tumour detection.

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