· Case Report ·

Waardenburg syndrome Ⅱ in China: a case report

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Abstract

• Waardenburg syndrome (WS) is an uncommon autosomally inherited and genetically heterogeneous disorder. The major features includes pigmentary disturbances and congenital deafness. Four subtypes of WS are recognized according to the clinical finding. A careful clinical description is needed to differentiate different types of WS and other associated diseases.

• KEYWORDS: Waardenburg syndrome; heterochromia iris; deafness

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INTRODUCTION

Waardenburg syndrome (WS) is an uncommon autosomally inherited and genetically heterogeneous disorder of neural crest cell development[1]. WS is named after a Dutch ophthalmologist, Waardenburg PJ, who described a syndrome comprising of six main clinical features: white forelock, heterochromia iris (total or partial), congenital deafness, broad nasal root, hypertrichosis of the medial eyebrows and lateral displacement of the medial canthi (dystopia canthorum) with dystopia of the lacrimal punctum[2,3]. We describe one subtype of WS (II) for its rarity in China.

CASE REPORT

A 18-year-old Chinese boy presented with blue right eye since birth (Figure 1). Ophthalmologic examination showed that his visual acuity was 0.5 in the right eye and 0.6 in the left eye, and best-corrected visual acuity was 1.0 in both eyes. Intraocular pressure was 12mmHg in the right eye and 13mmHg in the left eye. There was no bulbar hyperemia in both eyes. The cornea was lucent and the aqueous humor was clear. The pupils was round in the diameter of 3mm. Reflection to light was sensitive. The iris of the right eye and the upper iris of the left eye are heterochromia (Figure 2). The lens of eyes were both transparent. Fundoscopy revealed the irregular pigment distribution in the posterior pole with hyperchromic

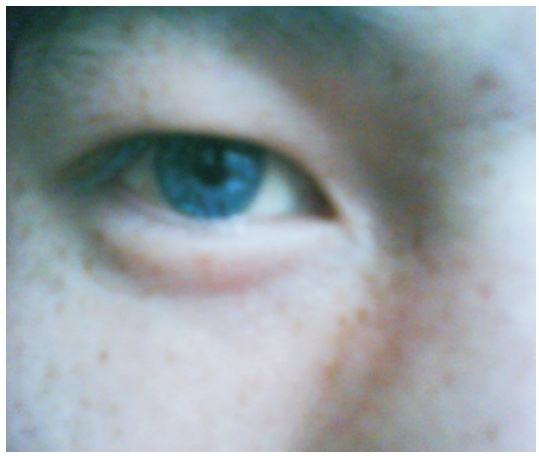

Figure 1 Camera photography showed albinic skin, brown freckles on his face in the blue right eye.

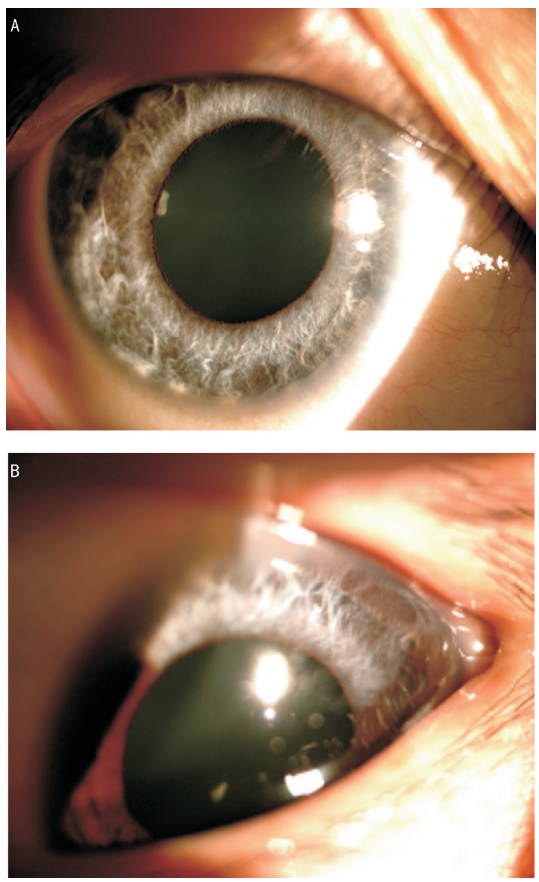

Figure 2 Anterior segment photography by slit lamp with white light A: totally heterochromia iris was showed in the right eye; B: partial heterochromia iris was showed in the left eye.

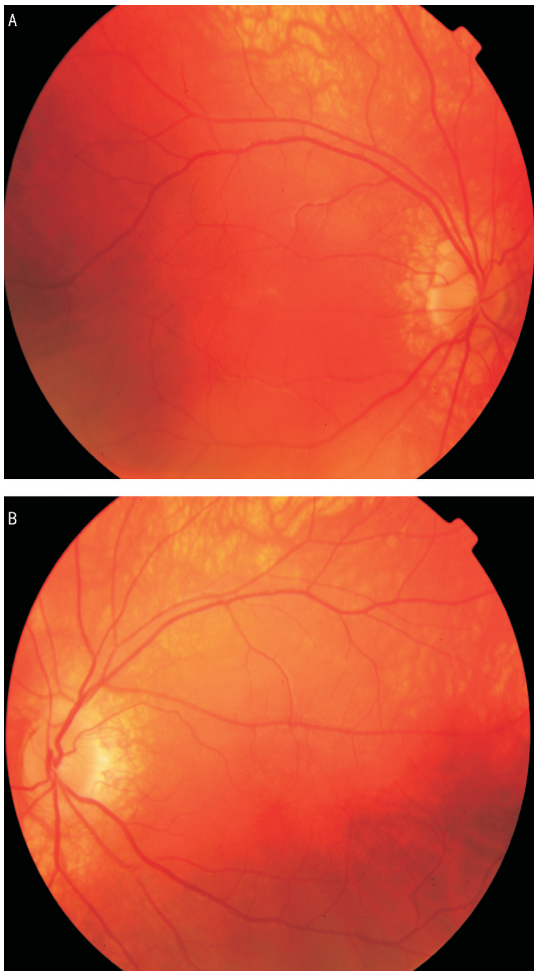

Figure 3 Fundus color photography showed the irregular pigment distribution in the posterior pole with hyperchromic and hypochromic choroids areas in both eyes A: The fundus of the right eye ; B:The fundus of the left eye.

and hypochromic choroids areas in both eyes (Figure 3). There's no limits in ocular movement. General physical examination revealed that he was teenager with white hair, albinic skin and brown freckles on his face. Past history showed heterochromia iris and deafness in both ears were found when he was born. His hair was grey from child. He had visited E. N. T department diagnosed with deep bilateral congenital neurosensorial deafness. Family history showed that his family members were ethnic Han in China. His mother had two blue eyes and deafness while his father was normal. His younger sister was one blue eye with unilateral deafness, but his elder brother was normal. He was born out of non-consanguineous parentage by normal vaginal delivery at full term after an uneventful pregnancy. He had no history of surgery. The boy was diagnosed with Waardenburg syndrome Ⅱ and ametropia. Wearing glasses was suggested to correct ametropia for him.

DISCUSSION

WS is classified as a disorder of neural crest cell development with distinct cutaneous manifestions. The major criteria are sensorineural hearing loss, iris pigmentary abnormality (two eyes different color or iris bicolor or characteristic brilliant blue iris), hair hypopigmentation (white forelock or white hairs at other sites on the body), dystopia canthorm (lateral displacement of inner canthi) and the presence of first-degree relative previously diagnosed with WS[1]. The minor criteria is skin hypopigmentation (congenital leukoderma or white skin patches), confluence of the eyebrows (synophrys), and premature graying of hairs (before age 30). However, the patients rarely display all the clinical signs. Four subtypes of WS are described according to the clinical features [4-9]. WS Ⅰ is WS with dystopia canthorum; WS Ⅱ is WS without dystopia canthorum; WS Ⅲ is a variant associated with musculoskeletal anomalies; WS Ⅳ is WS with congenital giant colon or gastrointestinal atresia. The clinical finding of this patient includes teenager with white hair, albinic skin, brown freckles on his face, heterochromia iris, congenital neurosensorial deafness, no dystopia canthorum, no musculoskeletal anomalies, no congenital giant colon or gastrointestinal atresia, so we have the diagnosis with WS Ⅱ. In his family, his mother got the same disease and his father was normal, 2 of 3 got the disease in their children, which indicated that all the patients were not completely explicit.

The clinical presentations of WS on the ocular involved blepharophimosis, dystopia canthorum, synophrys, heterochromia iris, iris agenesis, retinal pigment loss, microphthalmus and ametropia, *etc*[4], therefore if some similar presentations of the patients were found, it was probably considered with WS. The pattern of fundus pigmentation was considered a classic sign of WS, but there were several reports of this characteristic in the past. Congenital Horner syndrome also presented with iris heterochromia and became a differential diagnosis of WS. Albinism and Fuchs were also needed to be a differential diagnosis of WS. Patients with WS always got unilateral or bilateral deafness which would influence on their normal development, it was very important to prevent the deafmutism by early diagnosis of the deafness, giving the patients speaking and listening training, wearing hearing aid or even cochlear implantation. For the patients with amblyopia, we suggested them wearing glasses. To the patients with dystopia canthorum, we prefered lacrimal orthopaedic surgery. The boy in this case suffered from deafness was suggested giving cochlear implantation, but he refused for his economic difficulties. Actually, no treatment is available for patients with WS for the pathogeny at present. Six genes including PAX3, MITF, EDN3, EDNRB, SOX10, and SNAI2 were involved in WS[5]. So, gene therapy may be the effective method for WS in the future.

WS is very rare in China. The case shows that WS should be

diagnosed with careful differential diagnosis as early as possible for the necessary treatment.

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Waardenburg 综合征Ⅱ型 1 例

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摘要

Waardenburg 综合征(WS)是一种罕见的常染色体显性遗传病,其主要临床特点包括色素分布异常以及先天性耳聋。WS 共分为四型,临床上需同其他疾病仔细鉴别。

关键词:Waardenburg 综合征; 虹膜异色; 耳聋