A Photosensitivite Trichothiodystrophy Patient With A Mutation in *ERCC2* Gene

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ICNC 2022
17th INTERNATIONAL CHILD NEUROLOGY CONGRESS
ANTALYA, TURKEY | OCTOBER 3-7, 2022

ABSTRACT

Photosensitive Trichothiodystrophy(PS-TTD) is a rare autosomal reccesively inherited disease caused by three genes encoding different subunits of transcription factor TFIIH complex (*ERCC2*, *ERCC3*, *GTF2H5*). A 15-years old boy presented with microcephaly, mental and physical developmental delay, skin lesions, nail dystrophy, photosensitivity and also photophobia. Trichothiodystrophy was suspected and a gene panel containing Xeroderma Pigmentosum (XP) related genes was carried out. A homozygous likely pathogenic c.334C>T (p.Arg112Cys; rs760820378) variant in exon 5 of *ERRC2* was detected.

Objectives

Photosensitive Trichothiodystrophy(PS-TTD) is a rare autosomal reccesively inherited disease caused by three genes encoding different subunits of transcription factor TFIIH complex(*ERCC2*, *ERCC3*, *GTF2H5*). We present a 15-years old boy with sun sensitivity, mental and physical developmental delay, and tiger tail apperence of his hair under polarized light microscopy. DNA repair disordes should be kept on mind with patients with neurodevelopmental delay and photosensitivity.

METHODS

A 15-years old boy presented with microcephaly, mental and physical developmental delay(weight:35kg (<3p, -2.7SDS), height:156cm(7p, -1,47 SDS)), skin lesions, photosensitivity and also photophobia. His parents were first degree cousins. On physical examination, his entire body was covered by the dry skin. Ichthyosis was remarkable in his neck and ears. His hair was brittle. He had not having haircut for a long time. He had receding chin, prominent nose, large eyes, protruding ears, dystrophic nails (Figure 1). Diffuse signal hyperintensity of white matter was detected on MRI. We encountered tiger tail apperence in his hair examination under polarized light microscopy (Figure 2). Xeroderma Pigmentosum related genes was studied for considering the diagnosis of Photosensitive Trichothiodystrophy

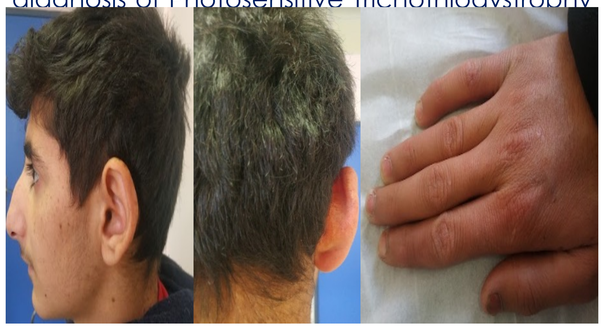

Figure 1. Microcephaly, prominent nose, receding chin, protruding ears, skin lesions on neck, dystrophic nails

RESULTS

Trichothiodystrophy was suspected and a gene panel containing Xeroderma Pigmentosum related genes was carried out. We obtained a homozygous likely pathogenic c.334C>T (p.Arg112Cys; rs760820378) variant in exon 5 of *ERRC2* (Figure 3).

Figure 3. Integrative genomics viewer(IGV) view of the c.334G>A variant in ERCC2 gene.

CONCLUSION

ERCC2 gene is a subunit of transcription factor TFIIH complex which plays role in both nucleotide excision repair and transcription. This gene also causes XP and Cockayne syndrome phenotypes. We considered primarily PS-TTD disease in our patient due to the tiger tail apearence under polarized microscope and physical findings. However there are patients have features of more than one disease. Therefore, we decided to follow patient for any potential skin malignancy which is a feauture of XP.

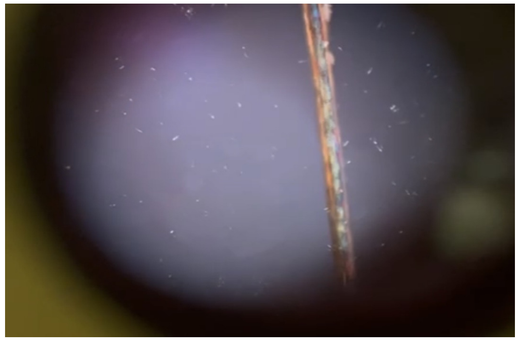

Figure 2. Tiger tail apperence of his hair under polarized light microscopy.

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ACKNOWLEDGEMENT

Permission was obtained from the patient and his parents for photos.