Original Article

Dermoscopy-Guided Surveillance in Xeroderma Pigmentosum: A Retrospective Analysis

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Abstract

Aim: Xeroderma pigmentosum (XP) is a life-threatening disease characterized by high rates of skin cancers. Therefore, it is important to establish key guidelines for the follow-up of these patients to detect skin cancers, particularly melanoma, at an early stage.

Materials and Methods: This is a retrospective study that includes the analysis of the follow-up findings and medical records of XP patients who were followed up with whole-body skin examination, dermoscopic examination, and whole-body photographing between 2003 and 2021 in the Dermato-Oncology unit of Ege University Department of Dermatology.

Results: Of the 19 patients, 10 were male and 9 were female. The youngest patient was 5 years old, while the oldest patient was 64 years old. A total of 234 lesions were excised from these patients. Seventeen melanomas were excised, including 11 *in situ*, with a Breslow thickness of less than 1 mm. The highest Breslow scores belong to patients who missed their appointments or did not receive follow-up care previously.

Conclusion: It was observed that regular full-body skin examinations, whole-body photography, and dermoscopic monitoring performed at 3-month intervals in XP patients are helpful in detecting skin malignancies at an early stage and preventing unnecessary excisions.

Keywords: Xeroderma pigmentosum, dermoscopy, basal cell carcinoma, squamous cell carcinoma, melanoma

Introduction

Xeroderma pigmentosum (XP) is an autosomal recessive genetic disease that affects the DNA repair system necessary to repair DNA damage caused by ultraviolet radiation.[1] It is characterized by marked photosensitivity, facial freckles that appear before the age of 2, ocular findings including keratitis and photophobia, and an early onset of skin malignancies such as basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma.[2] In XP patients under 20 years of age, the risk of developing non-melanoma skin cancer is 10,000 times higher, while the risk of developing melanoma is 2,000 times greater compared to the general population.[3] Due to the high rates of skin cancers, this disease can be life-threatening, and the prognosis depends on the patient's awareness of the disease, sun protection measures and early diagnosis of skin cancers.[4] However, widespread actinic damage characterized by multiple lentigines, actinic keratoses, and poikiloderma complicates the diagnosis of skin tumors in these patients. In this context, dermoscopy serves as a non-invasive tool that aids in the early diagnosis of skin tumors in these individuals.[5] Few reports in the literature discuss the role of dermoscopic follow-up in the early detection of skin tumors in XP patients.[5,6] In our study, we aimed to highlight the importance of dermoscopic follow-up for the early detection of skin tumors in XP patients.

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Materials and Methods

Our study ethical approval was obtained from the Ege University Medical Research Ethics Committee (approval number: 21-11.1T/46, date: 18.11.2021). Consent was obtained to analyze patients' medical records for the study. Patients with XP underwent whole-body skin examinations, dermoscopic examinations, and whole-body photographs between 2003 and 2021 at the Dermato-Oncology unit of Ege University Department of Dermatology. Patients were followed up every three months with total body photographing whole body dermoscopic examination. In the present study, we analyzed the follow-up findings and medical records of these patients. We noted their age, sex, follow-up duration, and the pathology reports of excised skin tumors, and melanocytic lesions.

Statistical Analysis

All data were analyzed descriptively. Continuous variables were summarized as mean ± standard deviation, and categorical variables were presented as frequencies and percentages. No comparative statistical tests were performed due to the descriptive and retrospective design of the study.

Results

Patients' Demographics Features

A total of 19 XP patients were followed up between 2003 and 2021 in the Dermato-Oncology Unit of the Department of Dermatology at Ege University. Fourteen of these patients attended follow-up visits regularly, while five patients did not attend consistently for unknown reasons. Of the 19 patients, 10 were male and nine were female. The youngest patient was 5 years old, and the oldest patient was 64 years old. The mean age was 24.97 (±15.07), with the mean age for male patients being 22.7 (±12.29) and for female patients being 27.4 (±17.31). A total of 234 lesions were excised from these patients.

Skin Cancer Development Age

The earliest age of BCC development was 7, the SCC development age was 6, and melanoma development was 8. The mean ages of BCC, SCC, and melanoma were 20.15 [±13.56, minimum (min.): 7, maximum (max.): 59], 23.22 (±12.42, min.: 6, max.: 47), and 18.3 (±7.9, min.: 8, max.: 28), respectively.

Skin Cancer Characteristics

Basal Cell Carcinoma

In total, 139 BCCs were excised. The histopathological types of these BCCs included 38 nodular, 12 superficial, 9 micronodular, 8 infiltrative, 6 noduloulcerative, 6 ulceroinfiltrative, 3 ulcerative, 2 morpheaform, 7 mixed type, and 1 bowenoid type. The type was not specified in the pathology report for 47 cases. The highest number of BCCs in a single patient was found to be 56, followed by 42. Additionally: a 64-year-old female patient who had been followed up for 10 years and had a single instance of BCC was remarkable due to her generally stable health status.

Squamous Cell Carcinoma

A total of 44 SCCs were excised, 6 of which were located in the lip mucosa and the others were cutaneous. Fifteen of these SCCs were *in situ*, 9 were well-differentiated, 5 were moderately differentiated, 8 were poorly differentiated, 4 were microinvasive, 1 was keratoacanthoma-like type, and the type of 2 was unspecified in the pathology report. In addition, five conjunctival SCCs, three corneal SCCs *in situ*, and one high-grade squamous intraepithelial neoplasia in the cornea were excised by ophthalmologists.

Melanoma

Only 5 of 19 XP patients developed melanoma during the follow-up. A total of 17 melanomas were excised, five of which were excised from a single patient. Among these, 11 melanomas were *in situ*, 5 of which were lentigo maligna. The Breslow thicknesses of the other patients were as follows, in order from the lowest to the highest: 0.27 mm, 0.9 mm, 0.93 mm, 2.3 mm, 5.6 mm, and 15 mm. One patient was referred to our unit for the first time with melanoma metastasis in a lymph node of unknown origin; prior to this, he had never been followed by dermoscopy.

Other Malignant and Benign Tumors

Other excised malignant tumors included 5 atypical melanocytic proliferations, 1 atypical fibroxanthoma, 1 melanocytic tumor with regressive changes, 1 melanocytic tumor of uncertain malignant potential, 3 angiosarcomas, and 1 vascular tumor with uncertain malignant potential. A total of 22 benign lesions were excised, including 6 compound nevi, 6 junctional nevi, 3 dysplastic nevi, 2 lentiginous nevi, 2 dermal nevi, 1 dermal melanocytic hamartoma, 1 lentiginous hyperplasia, and 1 spitz nevus.

Discussion

The literature on the role of dermoscopic follow-up in XP patients is limited. To the best of our knowledge, there are only two reports regarding dermoscopic follow-up in XP patients. Firstly, Malvehy et al.[5] reported dermoscopic findings of melanoma and non-melanoma skin cancers in two siblings who were followed for nearly 5 years. They suggested that distinguishing between benign and malignant tumors based solely on clinical examination is difficult, but dermoscopy aids in deciding on excision and helps detect melanoma at an early stage.

Green et al.[6] demonstrated that an XP patient followed for 23 years developed 38 primary melanomas, SCCs, and 70 BCCs during follow-up. They also stated that none of the melanomas in this patient exhibited deep local invasion or metastasis. The authors monitored this patient with a whole-body skin examination, whole-body photographs, and dermoscopic assessments at 6-week intervals. They noted that many new melanomas were detected within 6 weeks. Thus, the authors recommended combining whole-body skin examination, photography, and dermoscopy at short intervals in the management of XP patients.

In the present study, most cases were detected at the *in situ* stage in both SCCs and melanomas (Figure 1). Additionally, many melanomas were identified while still at a thin Breslow thickness. The patient with the highest Breslow thickness had not been previously followed up and was referred to the Dermato-Oncology unit by plastic surgery. This finding supports the crucial role of regular patient follow-up through total body examinations, total body photography, dermoscopic monitoring, and dermoscopic photography of suspicious skin lesions for the early detection of melanomas. Although the diagnostic accuracy of dermoscopy was not evaluated quantitatively in this retrospective study, all excised melanomas exhibited dermoscopic features suggestive of malignancy, such as asymmetric pigmentation, atypical network, and irregular streaks. Dermoscopy was instrumental in selecting lesions for excision.

Green et al.[6] recommended follow-up at 6-week intervals. However, our study results indicate that follow-up performed at 3-month intervals is also sufficient to detect melanoma in their early stage. Additionally, follow-up intervals can be adjusted based on the frequency of skin cancer and suspicious skin lesions in the patient, provided the patient adequately complies with sun protection measures. It was noted that the patient with melanoma, having a Breslow thickness of 5.6 mm, did not seek examination for a long time, and consequently, the lesion reached this stage. Additionally, it was noted that this same patient had the highest number of melanomas and BCCs in our series; and they frequently delayed appointment dates and did not comply with sun protection recommendations. This serves as a unique example of how the patient's adherence to regular follow-up and sun protection influences early melanoma diagnosis.

The total number of benign lesions excised from the patients was 22, with some being congenital, others removed due to atypical criteria, and changes during follow-up, and some excised alongside the malignant tumor as they were located near it (Figure 2). It was observed that a total of 76 benign lesions were excised at the external center before the patient, who began to be followed up at the age of 27, was admitted.

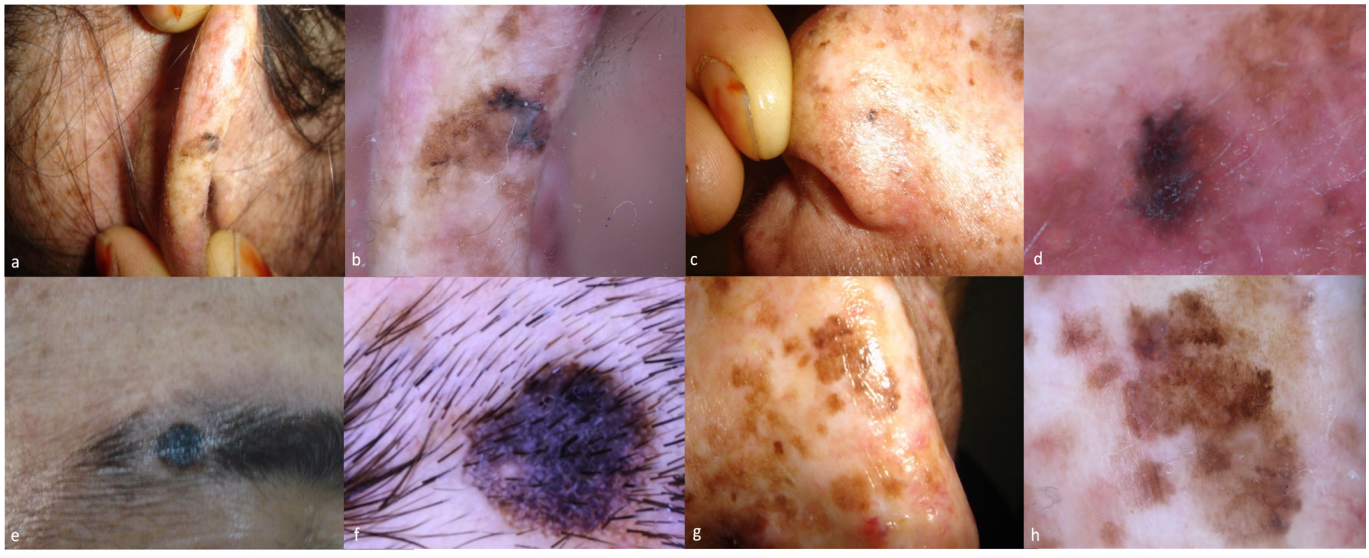

Figure 1. Clinical and dermoscopic pictures of (a, b) an *in situ* melanoma on the ear helix, (c, d) a tiny lentigo maligna on the patient's nose, (e, f) a sneaky melanoma (stage T1B) hiding behind thick eyebrows, and (g, h) lentigo maligna on the patient's nose

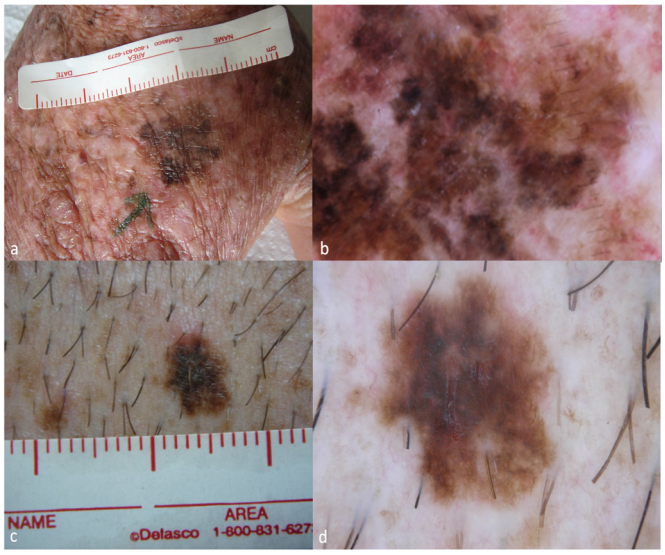

Figure 2. (a, b) Clinical and dermoscopic images of lentiginous hyperplasia mimicking melanoma; (c, d) An "ugly duck" lesion was found to be a dysplastic nevus on histopathology

These excision numbers for a single patient are significantly higher than our total number of melanocytic lesion excisions across all patients under follow-up, and highlight the importance of dermoscopic follow-up in reducing excision rates among these patients. Preventing unnecessary excisions is important in reducing the cost and undesirable cosmetic outcomes associated with redundant surgical procedures. Therefore, decline in the quality of life for patients is prevented.

Study Limitations

One important limitation of this study is the lack of genetic subtyping of XP patients. Due to the retrospective design and the long duration of follow-up (starting in 2003), routine genetic testing was not performed in most cases. As a result, genotype-phenotype correlations could not be assessed. Future prospective studies incorporating genetic data may help clarify subtype-specific cancer risks in XP.

Conclusion

Our patient series shows that regular full-body skin examinations, whole-body photographs, and dermoscopic monitoring performed at three-month intervals in XP patients are crucial for detecting skin malignancies at an early stage and preventing unnecessary excisions in these patients.

Ethics

Ethics Committee Approval: Ethical approval was obtained from the Ege University Medical Research Ethics Committee (approval number: 21-11.1T/46, date: 18.11.2021).

Informed Consent: Consent was obtained to analyze patients' medical records for the study.

Footnotes

Authorship Contributions

Concept: G.O., N.D., B.Y., T.A., I.K., Design: G.O., N.D., B.Y., T.A., I.K., Data Collection or Processing: G.O., N.D., B.Y., T.A., I.K., Analysis or Interpretation: G.O., N.D., I.K., Literature Search: G.O., N.D., I.K., Writing: G.O., N.D., I.K.

Conflict of Interest: The authors declared that they have no conflict of interest.

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