

A Case of Beau's Lines at Even Intervals and Onycholysis Caused by Chemotherapy

Tatsuhiko Morioka, Ichiro Kurokawa^{*}, Kei-ichi Yamanaka, Hitomi Sugisaki, Koji Habe, Ken-ichi Isoda and Hitoshi Mizutani

Department of Dermatology, Mie University Graduate School of Medicine, Japan

Abstract: We report a case of Beau's lines at even intervals and onycholysis caused by chemotherapy. The patient with a diffuse large cell B cell lymphoma (DLBCL) stage IIA underwent combination chemotherapy consisting of R-CHOP (Rituximab, cyclophosphamide, doxorubicin, vincristine, prednisolone) every three weeks (21-day intervals) six times. As he was treated with R-CHOP, he noticed each Beau's lines (transverse groove) on all 20 nails each time. In addition, he had onycholysis caused by cyclophosphamide and doxorubicin treatment. Two months after discontinuation of chemotherapy, Beau's lines disappeared.

Beau's line are transverse grooves on the nail surface. They are observed in severe systemic diseases such as measles, Stevens- Johnson syndrome, zinc deficiency, pustular psoriasis, chemotherapy, Kawasaki's disease, pneumonia, telogen effluvium and so on [1]. The distance of groove from nail fold is related to the onset of growth disturbance. The depth and width of the groove may be related to the severity and duration of the disturbance [2]. The pathomechanism of Beau's line is attributable to temporary arrest of nail matrix formation [1]. There are several reported cases of Beau's lines [3, 4] and transverse leukonychia [4] induced by chemotherapy.

The 74-year-old man with a history of diffuse large cell B cell lymphoma (DLBCL) was treated with R-CHOP (Rituximab, cyclophosphamide, doxorubicin, vincristine, prednisolone) therapy every three weeks. After three cycles of R-CHOP chemotherapy, he noticed transverse grooves on the nail plates and paronychia erythema. At the first dermatological consultation, physical examinations revealed five transverse grooves (Beau's lines) and paronychia erythema (Fig. 1) on all 20 nails after six cycles with R-CHOP chemotherapy. The grooves were 1 to 2mm width with regular borders completely transverse each affected nails. Because he had diabetes mellitus, prednisolone was prescribed 20 mg/day. Laboratory findings were normal.

The patient was diagnosed as Beau's line due to chemotherapy (probably due to cyclophosphamide and doxorubicin). Chemotherapy was discontinued after six cycles. He was treated with topical betamethasone valerate ointment. After two months of discontinuing chemotherapy, the paronychia erythema disappeared. The nail plate was separated from nail bed (onycholysis). Subsequently, Beau's lines disappeared, and then newly nail plate grew. As differential diagnosis, Muehrcke's line was considered. Muehrcke's

lines are nonpalpable horizontal white lines and do not indent the nail itself [5].

Concerning nail change due to chemotherapy, doxorubicin may cause Beau's line and onycholysis [6]. Cytotoxic drugs exert the direct effects on nail matrix and nail plate, causing transverse grooves with nail dystrophy. Chemotherapy can cause transverse white lines [7]. Cyclophosphamide cause pigmentation on nail plate [8]. This may be attributable to increased melanin production of melanocytes in nail matrix. Mild toxic reactions produce Beau's line, while severe toxic reactions produce onycholysis [9].



Fig. (1). Transverse grooves (Beau's lines) at even intervals and paronychia erythema were observed.

^{*}Address correspondence to this author at the Department of Dermatology, Mie University Graduate School of Medicine, 2-174, Edobashi, Tsu, Mie 514-8507, Japan; Tel: +81-59-232-1111, Ext. 6421; Fax: +81-59-231-5206; E-mail: kuroichi@clin.medic.mie-u.ac.jp

In the present case, we evaluated history of previous drug therapy and anamnesis. We speculate that Beau's lines are attributable to doxorubicin and cyclophosphamide. Interestingly, Beau's lines at even intervals were observed at each cycle of chemotherapy. Since our patient had diabetes mellitus, prednisolone was prescribed 20mg. Prednisolone is usually prescribed 100mg. The low dose of prednisolone may be insufficient to prevent the formation of Beau's lines because of anti-cytotoxic effect on nail matrix and nail bed.

REFERENCES

- [1] Burkhart C. Beau's lines : an association with pustular psoriasis and telogen effluvium. Arch Dermatol 1980; 116: 1190-1.
- [2] de Berker DAR. What is a Beau's line? Int J Dermatol 1994; 33: 545-6.
- [3] Miyoshi I, Kubota T, Taguchi H. Beau's lines after chemotherapy for ALL. Intern Med 2007; 46: 61.
- [4] Cohen PR. New onset nail abnormalities: cancer chemotherapy induced Beau's line and transverse leukonychia. Clin Advisor 2003; 6: 40-3.
- [5] Morrison-Bryant M, Gradon JD. Muehrcke's line. N Engl J Med 2007; 357: 917.
- [6] Cunningham D, Gilchert N, Forrest G, Soukop M. Onycholysis associated with cytotoxic drugs. Br Med J 1985; 290: 675-6.
- [7] James WD, Odom RB. Chemotherapy-induced transverse white lines in the fingernails. Arch Dermatol 1983; 119: 334-5.
- [8] Harrison BM, Wood CBS. Cyclophosphamide and pigmentation. Br Med J 1970; 2: 352.
- [9] Fitzpatrick JE. Mucocutaneous complications of antineoplastic therapy. Fitzpatrick's Dermatology in General Medicine, 6th ed, McGraw-Hill-book Co., 1337-47, 2003.

Received: December 26, 2008

Revised: January 9, 2009

Accepted: January 13, 2009

© Morioka *et al.*; Licensee Bentham Open.

This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted, non-commercial use, distribution and reproduction in any medium, provided the work is properly cited.