Case of Recurrent Type B Pigmentary Demarcation Lines in a Pregnant Woman

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ABSTRACT

Pigmentary demarcation lines are abrupt demarcation lines between the light and dark pigmentation areas that usually occur on the upper and lower limbs. They are considered to be associated with the distribution of cutaneous peripheral nerves and pigmentary differences due to neurogenic inflammation. Herein we report a rare case of type B pigmentary demarcation lines in a white pregnant female presenting with persistent lesions that occurred during the first trimester and continued even 1-year postpartum. She also had similar pigmentary abnormalities in her previous pregnancy. The recurrence, persistence and the unique distribution pattern of pigmentary demarcation lines including not only the posterior but also the anterior portion of her lower extremity were the remarkable aspects of this case.

Key words: Pregnancy, pigmentary disorder, skin pigmentation, type B pigmentary demarcation lines

INTRODUCTION

Pigmentary Demarcation Lines (PDL), also known as Futterer's or voigt lines, are abrupt physiological transition lines between the areas of darker pigmentation and the areas of lighter, normal pigmentation particularly seen in females and people with darker skin types (Kalasapura et al., 2014; Cho et al., 2012). They are classified into eight types, from A to H, based on the site of occurrence. Type B PDL involve the posterior medial portion of the lower extremities and are more commonly associated with pregnancy and often show spontaneous resolution after delivery (Peck and Cusack, 2013). These lesions are mostly seen during the third trimester of pregnancy and most frequent in Black and Japanese populations and rare in Caucasians (Bonci and Patrizi, 2002).

Other common types of PDL are; type A that mostly occurs in the lateral aspect of the upper anterior portion of the arms across the pectoral area and type C that consists of a vertical hypo pigmented line in the presternal and parasternal areas (Peck and Cusack, 2013; Gupta et al., 2005; Somani et al., 2004). Rare variants are type D that is commonly seen in the posterior medial area of the spine and type E that occurs in the bilateral aspect of the chest from the mid third of the clavicle to periareolar skin. The remaining types, F, G and H, are rarer variants of PDL that are seen on various facial areas.
Herein we report a rare case of type B PDL in a white pregnant female, presenting with persistent lesions that occurred during the first trimester of pregnancy and continued even after 1-year postpartum.

**METHODOLOGY**

**Case:** A 3-months pregnant multigravida white woman aged 34 presented to our dermatology clinic due to the presence of asymptomatic dark demarcation lines that appeared on her posterior legs. The lesions had developed around the 8th week of her pregnancy and gradually became more noticeable. Her medical history and current medication were otherwise unremarkable. She was slightly concerned that she had experienced a similar temporary pigmentation during her previous pregnancy that spontaneously resolved 6 months after delivery. The dermatological examination revealed bilateral, symmetrical, well-demarcated, hypo and hyper-pigmented patches spreading from the inner aspects of the thighs down to the popliteal fossae and distal medial portion of the calves (Fig. 1a). We also noted a non-determined hypo-pigmentation on the anterior aspect of her left thigh (Fig. 1b) although she completely denied the presence of any post-inflammatory hypopigmentation. A histopathological examination was performed on the basal layers of hyper-pigmented and hypo-pigmented areas. Small vessels were dilated and there was perivascular lymphocytic infiltration in the papillary dermis (Fig. 2a). Basal hyper and hypo-pigmentation was shown for Masson Fontane (x200) (Fig. 2b). The patient was diagnosed with type B; PDL based on her medical history, physical examination and histopathological findings. The lesions persisted for a year after delivery.

![Image](image_url)

Fig. 1(a-b): (a) Bilateral, symmetrical, well-demarcated, hypo and hyper-pigmented patches spreading from the inner aspects of the thighs down to the popliteal fossae and distal medial portion of the calves and (b) A non-determined hypo-pigmentation on the anterior aspect of the left thigh.
RESULTS AND DISCUSSION

The pathogenesis of type B PDL is largely unknown. In general, PDL do not follow the lines of Blaschko or dermatomes (Peck and Cusack, 2013). According to Selmanowitz and Krivo (1975), PDL are streaks of melanocyte accumulation along the embryological axial line but not along the Blaschko's lines as in type A PDL. Delmonte et al. (1997) found that some authors believed that these lesions are not always associated with pregnancy and they occur due to the distribution of cutaneous peripheral nerves that cause pigmented differences due to neurogenic inflammation. In a study involving 380 patients, although PDL were reported to occur typically during childhood which supports the former theory, seven of fifty black women (14%) were noted to have the new appearance of type B lines with pregnancy (James et al., 1987). Furthermore, the cause of PDL during pregnancy is also unknown. Ozawa et al. (1993) suggested that pigmented abnormality was caused by the compression of the peripheral nerves at S1 and S2 by an enlarged uterus during pregnancy. Other related theories include; increased vascularity during pregnancy or a local trigger factor coupled with high levels of estrogen, progesterone and melanocyte-stimulating hormone (Peck and Cusack, 2013). Fetoplacental hormone production or alterations in clearance may increase the plasma availability of hormones, such as estrogens and progesterone, inducing pigmented changes in pregnancy (Gupta et al., 2005).

Happle (1993) also suggested that the familial pattern and female predominance led to the hypothesis of cutaneous mosaicism pigmented pattern by paternal X chromosome lyonization.

Since PDL are asymptomatic, they are usually considered to be a minor cosmetic disfigurement which may be overlooked and observed without treatment. In a review by Nakama et al. (2009)
19 cases of type B PDL were reported to have resolved within a year of delivery. Although type B PDL are transitory, they may persist in some patients as seen in our case.

To the best of our knowledge, our case is unusual due to the unique distribution of type B PDL which involved not only the posterior portion of the lower extremities but also the anterior thigh and it is the second case that has so far been reported in the literature (Cho et al., 2012). The unusual presence of a non-determined hypo-pigmentation on the anterior flexor aspect of the left thigh in this case indicated that this could possibly be a new subtype of type B PDL since the patient denied the occurrence of any following post-inflammatory hypopigmentation. This case was also remarkable since the patient reported to have had similar but temporary pigmentation in her previous pregnancy. The reason for this recurrence has to be further investigated through clinical studies. Another topic of discussion is the very early onset of PDL in this case before the 18th week which is commonly reported as the beginning time of lesions during pregnancy.

REFERENCES