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Carotenoderma In An 11-Month-Old Child: A Case Report.

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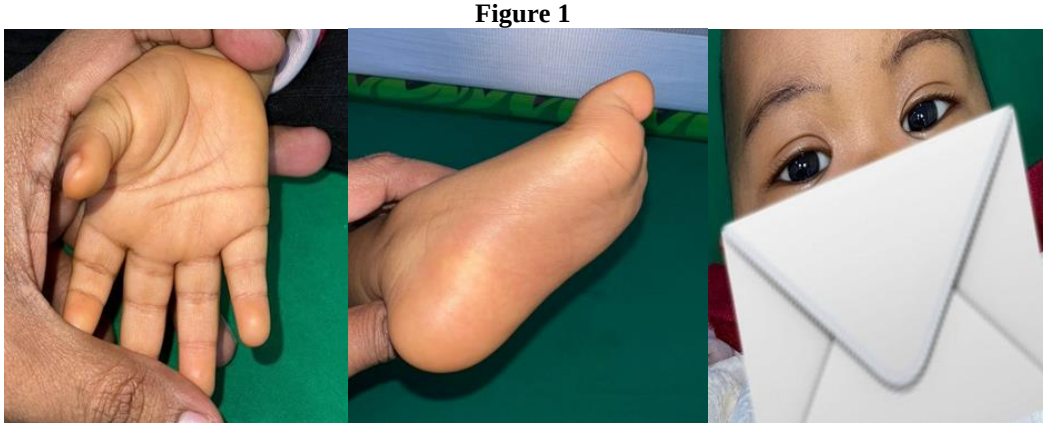
I. Case Presentation.

An 11-month-old female presented to the outpatient department with chief complaints of yellow-orange discoloration of the skin for 4 months (Figure 1). The discoloration was more marked on both the palms and soles. There was no yellow discoloration of the eyes. No fever was reported. Urine and stool were normal in frequency and color.

Figure 1



Abdominal symptoms were unremarkable. The child was feeding well and was active. On review of dietary history the mother reported to have been giving the child pumpkin puree alternating with carrot puree every day. All other milestones were achieved normally. The child received all immunizations as per IVDP (Immunization Vaccine Developmental Programme). There was no history of blood transfusion and PMTCT was negative. Past medical history was unremarkable. On physical examination; the child was alert, afebrile, not pale, not jaundiced, and not cyanosed. The palms and feet were yellow-orange, normal skin texture, and were non-tender, and non-edematous. Abdominal examination was normal and the liver span was within the normal range. Laboratory investigations were done and depicted in table 1. Abdominopelvic ultrasound was normal.

Table 1: Laboratory investigations

Laboratory test	Results	Reference range
Full blood picture	WBC 12.6 X 10^3/uL	4.00 – 10.00 x 10^3/uL
	Lymph% 73.6%	20 – 40%
	Abs Lymphocytes 9.28 x 10^3/uL	1.10 – 3.20 x 10^3/uL
	% Gran 19.5%	50 – 70%
	Abs gran 2.46 x 10^3/uL	2.00 – 7.00 x 10^3/uL
	RBC 4.49 x 10^6/uL	3.80 – 5.80 x 10^6/uL
	Hb 11.8g/dl	11.5 – 15.0g/dl
	Plt 280 x 10^3/uL	125 – 350 x 10^3/uL
Liver profile	Bilirubin Total 24.6umol/L	3-22 umol/L
	Direct bilirubin 7.96 umol/L	0-15 umol/L
	ALT 10.12U/L	10-40U/L
	AST 27U/L	8-33U/L

II. Discussion

Carotenemia was first described in the early 1900s; a medical condition characterized by elevated levels of beta-carotene in the blood1. It leads to a condition called carotenoderma defined as yellow-orange discoloration of the skin caused by consuming beta-carotene-rich foods2. Carotenemia was prevalent during the First and Second World Wars where plant-based food was the main source of nutrition due to famine3. Carotenemia is common in children ages 7 months to 11 years and adults of different ages4. Beta-carotene is a plant pigment that gives red, orange, and yellow plants their color1,5. Beta-carotene is a pro-vitamin A carotenoid that is converted in the body to Vitamin A (retinol)6. Hence, beta-carotene is known to be an antioxidant and plays a role in the prevention of Vitamin A deficiency6. Beta-carotenes are also found to be vital in preventing certain cancers, and cardiovascular events and decrease the risk of macular degeneration and cataracts7. Foods that are rich in beta carotene are raw carrots, apricots, sweet potatoes, butternut squash, cantaloupe, red and yellow peppers, and a few spices such as cayenne and paprika6,7,8. Clinically, carotenoderma is limited to thick parts of the skin such as the palms and soles1,8. The most common cause of carotenemia is excessive consumption of beta-carotene-rich foods and 10% of ingested carotene is absorbed directly without conversion and transported through the portal circulation to the liver9. Rarely carotenemia is caused by diabetes mellitus, hypothyroidism, anorexia nervosa, glomerulonephritis, and primary hepatic disease8. Carotenemia is also caused by an unbalanced diet containing beta-carotene-rich foods in abundance10. A genetic defect in beta-carotene-15-15'-dioxygenase enzyme that processes carotenoids may also lead to this condition11. The hallmark of this condition is the presence of yellow-orange skin mostly on the palms, soles, tip of the nose, and nasolabial folds8. Carotenoderma is seen under artificial light12. Carotenoderma must be distinguished from jaundice12. Evaluation involves a good history and physical exam, a high beta-carotene serum level and high serum vitamin A level, and normal liver function test12. Treatment involves dietary counseling to reduce foods rich in beta-carotene and this will eventually lead to the disappearance of the skin pigment13.

In this patient, there was discoloration of the skin to yellow-orange and the positive finding was in the nutrition history. Liver function tests were normal. Beta carotene levels and vitamin A were not done. The mother was counseled on a balanced diet and was assured the condition is benign. The symptoms resolved within two weeks of withdrawal from beta-carotene rich-foods (Figure 2 below)

Figure 2.

In conclusion, this case highlights the significance of dietary intake as a potential cause of skin discoloration, which can mimic other conditions such as jaundice. Carotenoderma, while benign, may prompt unnecessary investigations if not recognized clinically. Increased intake of carotene-rich foods, along with genetic or metabolic factors, can lead to the accumulation of carotenoids in the skin, especially in areas of thicker stratum corneum. This case underscores the importance of a thorough dietary history and clinical examination in differentiating carotenoderma from other yellowish skin conditions. Educating patients on balanced dietary habits can prevent recurrence, and, in most cases, discontinuing excessive intake of carotene-containing foods effectively resolves the condition.

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