

cutis[®] Photo Quiz

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A 53-year-old man presented with thick, sandpaperlike pebbling on the skin of his digits – a common cutaneous sign of a systemic disease.

What is your diagnosis?

PLEASE TURN TO PAGE 298 FOR DISCUSSION

The Diagnosis: Huntley's Papules (Diabetic Finger Pebbling)

Huntley's papules are a cutaneous sign of diabetes mellitus. Skin thickening may occur at all body sites in diabetes mellitus but is particularly noticeable on the hands (Figures 1–3). Fine pebbling is noted over the knuckles and skin of the distal fingers. The changes have been compared to the skin thickening and roughness normally present on the radial side of the first digit of the dominant hand (the result of holding a pen or pencil). In nondiabetic individuals, skin roughness and thickening is localized to the radial side of the first digit, near the distal proximal interphalangeal joint. Normally, the skin of the ulnar side of the finger is noticeably smoother than that on the radial side. If both sides feel the same, it is likely that the person has diabetes mellitus. High-resolution ultrasonography has been used to confirm the presence of skin thickening on the hands and feet of patients with diabetes.¹ Both epidermal and dermal thickening are present. Diabetic skin pebbling occurs in approximately 75% of patients with diabetes mellitus. Similar changes may occur in up to 21% of nondiabetic persons.²

The skin is a common target for injury in diabetes mellitus. Glycoxidation products resulting from hyperglycemia, such as N ϵ -(carboxymethyl) lysine and pentosidine, increase in skin collagen with age. These products deposit at an accelerated rate in diabetic skin, and their concentrations correlate with the severity of diabetic complications.³ Pentose sugars appear to be important in the formation of pathologic crosslinks through glycosylation of lysine and arginine residues. Pentosidine levels are markedly increased in skin collagen in insulin-dependent diabetic patients.⁴ These changes are an exaggeration of normal aging processes in skin collagen. So-called Maillard reaction products (products of sugar and amino acids similar to those formed when meat is grilled)



Figure 1. Huntley's papules.

accumulate in the dermis as a result of normal aging and of diabetic hyperglycemia.⁵ Evidence suggests that measurement of glycosylated proteins in skin, nails, and hair (especially furosine levels in nails) may serve as an index for long-term control of diabetes mellitus.⁶ Collagen production is increased in the presence of hyperglycemia.⁷ Other connective tissue constituents, such as fibronectin, are produced in increased amounts by fibroblasts in the setting of diabetes.⁸

Nerve growth factor may be related to keratinocyte proliferation as well as to functioning of

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Figure 2. Huntley's papules are a cutaneous sign of diabetes.

sensory nerve fibers in skin. Nerve growth factor levels are reduced in epidermal keratinocytes in diabetic skin, and its high-affinity receptor is upregulated.⁹

Wound healing may depend in part on expression of insulinlike growth factors in tissue. Diabetic mice show delayed expression of insulinlike growth factors in healing wounds. Delayed expression of adult and fetal insulinlike growth factors may be partially responsible for the poor wound-healing commonly seen in diabetic patients.¹⁰

Altered dermal collagen may result in the acquired perforating disorders characteristic to diabetic patients.¹¹ Patients with acquired perforating disorder may have chronic renal failure, diabetes mellitus, or both.¹²

Peripheral blood flow in diabetic patients is impaired. Although basal blood flow in their fingers is normal, abnormal vasoconstriction can be induced by cold exposure or by mental stress. Heat-induced vasodilatation in their fingers is also impaired. Both of these abnormal responses appear to be related to autonomic dysfunction. Similar changes may occur as a result of normal aging process, but autonomic dysfunction is already prominent in young diabetic patients.¹³ Microcirculatory impairment in diabetic skin results in decreased tissue perfusion and may result in reduced transcutaneous oxygen tension.¹⁴

Other characteristic skin changes may suggest a diagnosis of diabetes mellitus. Scleredema adultorum



Figure 3. Huntley's papules typically have a sandpaperlike texture.

is characterized by firm, indurated, often erythematous skin with a pebbled appearance involving the upper back. Skin biopsy specimens reveal a thickened dermis with collagen bundles widely separated by deposits of hyaluronic acid.¹⁵ Granuloma annulare, especially when widespread, may be a marker for diabetes mellitus.¹⁶ Acanthosis nigricans may be related to increased levels of insulin and insulinlike growth factors. Glycosaminoglycans, mainly hyaluronic acid, are increased in areas of endocrinopathy-associated acanthosis nigricans.¹⁷ Pretibial pigmented patches, poor wound-healing, necrobiosis lipoidica, and bullosis diabeticorum also may alert physicians to screen for diabetes mellitus.

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