Bilateral Symmetrical Nodules on the Thumbs in a Female Patient: A Quiz

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A 22-year-old Chinese woman presented with asymptomatic bilateral solitary nodules on her thumbs, which had been present since birth. There was no history of trauma, injection, or relevant family history. Physical examination revealed symmetrical, smooth, skin-coloured, hard nodules at the level of the metacarpophalangeal joints of the thumbs, measuring 3.0×6.0 mm, with no tenderness, itching, ulceration, or extrusion (Fig. 1). After obtaining informed consent, the lesions were excised, and a histopathological examination was performed.

What is your diagnosis? See next page for answer.

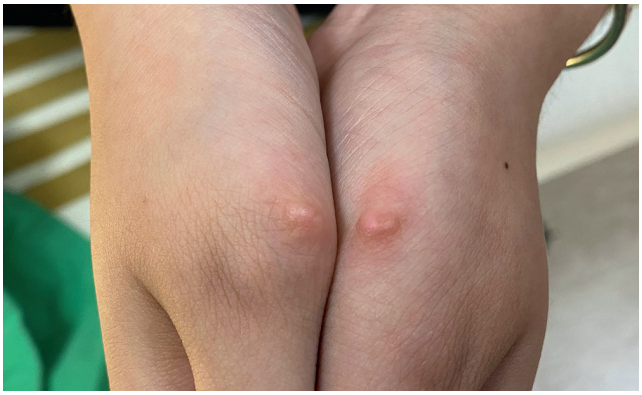

Fig. 1. Clinical photography. Symmetrical skin-coloured nodules at the level of the metacarpophalangeal joints of the thumb.

ANSWERS TO QUIZ

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Diagnosis: **Rudimentary polydactyly (RP)**

Histopathological analysis revealed hyperkeratosis and acanthosis, with elongated rete ridges in the epidermis. Nerve bundles surrounded by thin connective tissues of collagen fibres were seen in the dermis, with no osteoid or cartilage (Fig. 2A, B). Multiple Wagner-Meissner bodies were evident in the deep dermis (Fig. 2C) confirming a diagnosis of rudimentary polydactyly (RP). No recurrence was observed 6 months post-excision.

Polydactyly, otherwise known as accessory digits, is rarely managed by dermatologists. RP is a congenital anomaly first described in 1954 (1), which often consists of a poorly formed digit, piece of cartilage, or vestigial nail apparatus, and is considered an autosomal-dominant disorder with an unknown genetic basis (2). RP is characterized by isolated skin-coloured nodules or pedunculated cord-like structures, primarily at the ulnar side of the little finger or sometimes the radial side of the thumb (3). Rudimentary digits on the bilateral radial aspect of the thumbs are extremely rare. Histologically, RP typically shows a marked neural proliferation in the dermis, with many Meissner corpuscles (also known as Wagner-Meissner corpuscles), which are ellipsoid mechanoreceptors that play an essential role in somatosensory acuity (3, 4). Occasionally, abundant Merkel cells are seen in the basal layer or superficial dermis. Some authors consider that the development of Meissner corpuscles and the generation of the cutaneous nerve plexus may be associated with Merkel cells in the early stages of RP (4).

The aetiology of RP is poorly understood. Shapiro et al. investigated RP, finding similar histological features between acquired traumatic neuroma and RP, which suggests that their occurrence is a result of *in utero* auto-amputation (5). In this case, marked and variably sized nerve structures and a large number of Wagner-Meissner bodies in the dermis were observed. Although these histological features are characteristic of both traumatic neuroma and RP, lack of a precedent trauma helps to exclude the diagnosis of traumatic neuroma.

RP may also be confused with palisaded encapsulated neuroma, which often occurs as a nodule or nodules on the face, and histopathologically with well-circumscribed hypertrophic nerve bundles encapsulated by perineural cells (6). Other differential diagnoses include acquired digital fibrokeratoma and superficial acral fibromyxoma (2). Acquired digital fibrokeratoma typically presents as an asymptomatic, dome or bullet-shaped solitary nodule on the fingers or toes and acanthotic epidermis with thick collagen bundles oriented along the long axis of the lesion on histological analysis (7). Superficial acral fibromyxoma classically presents as a pink to flesh-coloured nodule located on the subungual or periungual region of the toes and fingers. The lesion is composed mainly of spindle-shaped and stellate cells, set in a myxocollagenous stroma with prominent vessels and mast cells (8).

There is no standardized treatment for patients with RP. As most cases are asymptomatic, conservative approaches are generally applied. We do not promote the use of ligatures, as they will leave a more noticeable and potentially painful eminence. Shave excision and laser therapy may cause unacceptable traumatic neuromas (2, 9). Thus, some authors recommend a sufficient depth of surgical excision, which is both curative and diagnostic (10).

The data and figures in this article were collected in accordance with Institutional Review Board (IRB) approval.

The authors have no conflicts of interest to declare.

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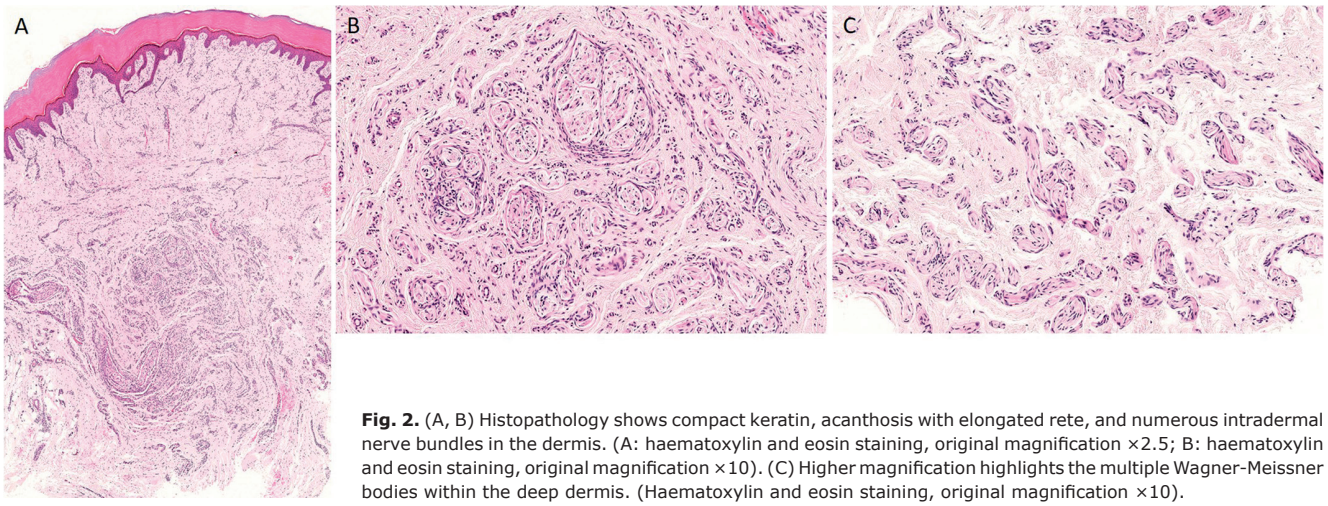

Fig. 2. (A, B) Histopathology shows compact keratin, acanthosis with elongated rete, and numerous intradermal nerve bundles in the dermis. (A: haematoxylin and eosin staining, original magnification ×2.5; B: haematoxylin and eosin staining, original magnification ×10). (C) Higher magnification highlights the multiple Wagner-Meissner bodies within the deep dermis. (Haematoxylin and eosin staining, original magnification ×10).

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