Recurrent Schwannoma With Bony Erosion of the Distal Middle Finger

Addison G. Wilson, Jr., MD, Eric P. Hofmeister, MD, and Michael Thompson, MD

Schwannomas, also known as neurilemomas, are a benign peripheral nerve sheath tumor composed of well-differentiated Schwann cells. Although they may be difficult to diagnose prior to surgery, schwannomas are distinguished intraoperatively as round, well-encapsulated eccentric tumors that are easily separated from local peripheral nerves.[1-3] Although schwannomas are often associated with neurofibromatosis type 2, most occur sporadically.[4,5] Treatment usually is simple mass excision while taking care to spare the contributory nerve.[3,4] Recurrence of a schwannoma after excision is rare,[3,6,7] as is erosion of the adjacent bone.[8-10]

We present an unusual case of a schwannoma involving a digital nerve that not only had recurred multiple times but also had uncharacteristic bony erosion and nail bed destruction, which required bone grafting and nail bed reconstruction.

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Case Report

A 20-year-old man with no significant medical history was evaluated for an enlarging subungual mass on his left middle finger 3 years prior to latest presentation. The mass first presented as an insidious enlargement of the tip of his digit after a mild crushing incident to this finger 6 months earlier. The patient complained of mild pain with use, as well as poor cosmetic appearance.

On examination, there was a 12-mm mass on the distal ulnar aspect of his middle finger that was lifting the nail bed. The mass was tender to palpation, and 2-point tactile discrimination was normal at less than 5 mm in all digits. The patient had full range of motion in his digit. Plain x-ray films at this time revealed soft-tissue thickening with smooth erosion of the distal bony phalanx and a sharp zone of transition. The patient opted for mass excision, and during surgery, it was noted that a small branch of the adjacent digital nerve was retracted as the well-encapsulated mass was shelled out. After excision, the phalanx was curetted, and bone allograft was placed in the defect. Pathological findings were consistent with a schwannoma.

The patient was symptom free for 20 months, when he returned with recurrent symptoms. Radiographs of the affected digit once again revealed increased soft-tissue mass with bone spicules and an area of bony erosion involving the same digit. The patient elected for a second

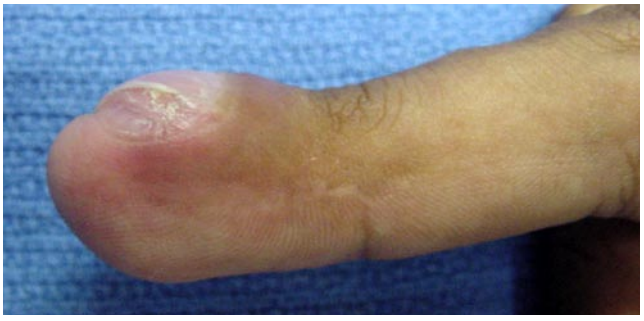

Figure 1. Preoperative photograph of the affected left long finger.

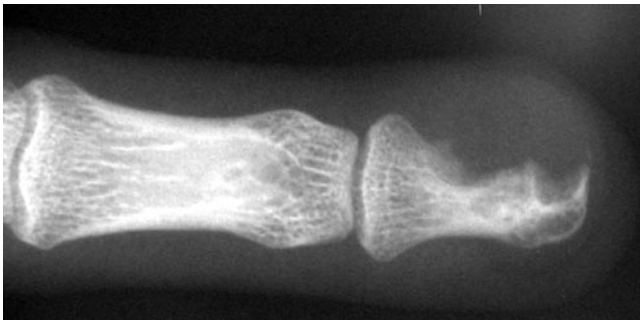

Figure 2. Preoperative posteroanterior radiograph of the left long finger showing a well corticated lytic lesion and an area slightly more proximal with loss of cortex and local scalloping of the bone.

Dr. Wilson is Physician, Undersea Medical Officer School, Groton, Connecticut.
Dr. Hofmeister is Director, Hand and Microvascular Division, Orthopaedic Surgery Department, Naval Medical Center San Diego, and Assistant Professor of Surgery, Uniformed Services University of the Health Sciences, San Diego, California.
Dr. Thompson is Program Director, Orthopaedic Department, Naval Medical Center San Diego, San Diego, California.

Requests for reprints: CDR Eric Hofmeister, MD, Department of Orthopedics, Naval Medical Center San Diego, 34800 Bob Wilson Dr, San Diego, CA 92134-5000 (tel, 619-532-8427; e-mail, eric.hofmeister@med.navy.mil).

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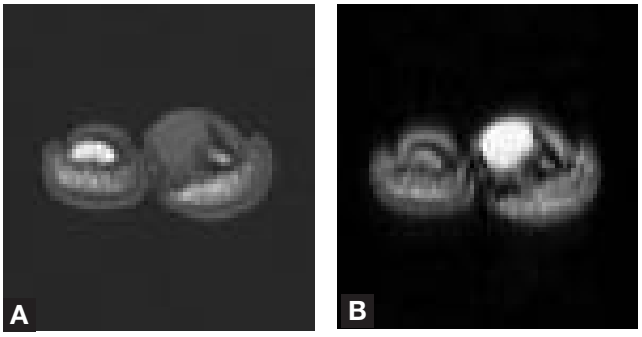

Figure 3. (A) Axial T_1-weighted image. (B) Axial T_2-weighted image.

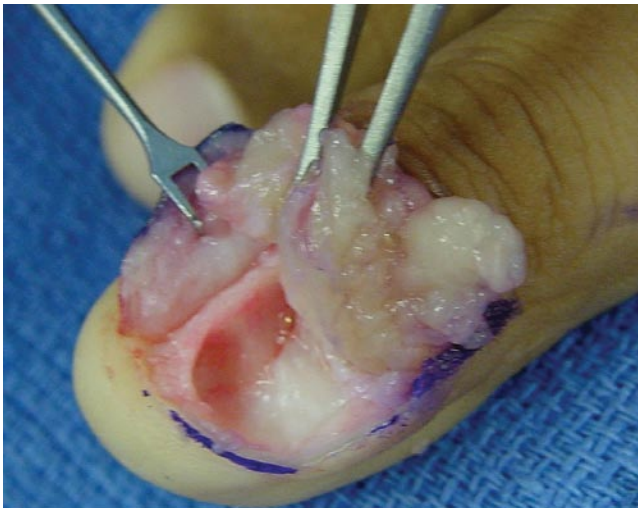

Figure 4. Intraoperative photograph of Schwannoma excision (left middle finger).

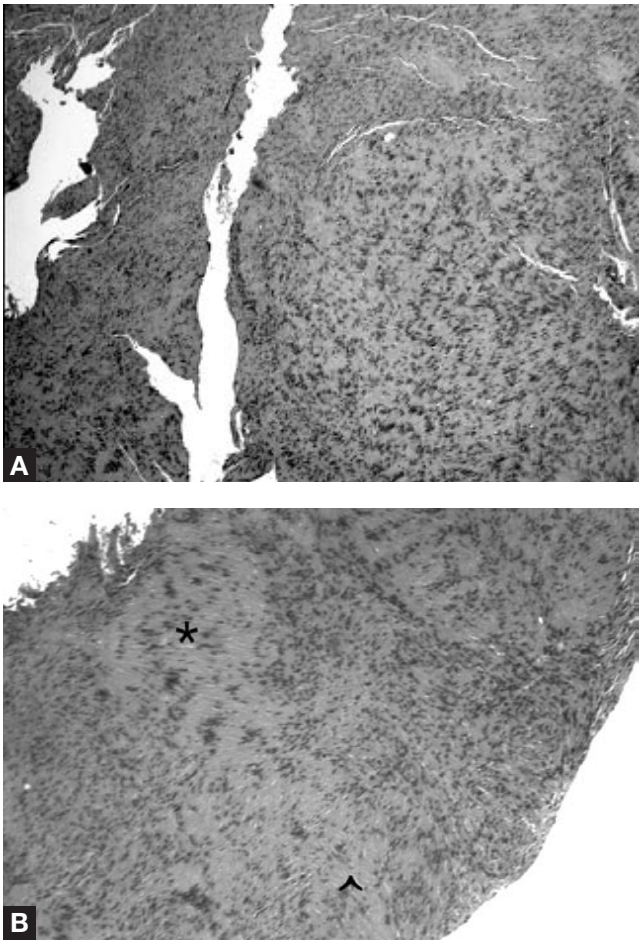

Figure 5. Histological slide showing the predominant Antoni A pattern (*) with Antoni B (^) also present (hematoxylin-eosin, original magnification X 40).

excision. The soft-tissue mass was excised, and bone was cut with a rongeur. Again, pathological findings were consistent with schwannoma.

The patient did well until 2 months after surgery, when he returned with increased distal phalanx sensitivity, subungual soft-tissue expansion, and progressive nail bed elevation. Upon presentation at our facility, the digit was grossly enlarged, with the nail bed and plate elevated (Figure 1). Physical examination showed full range of motion and normal sensation (both Semmes Weinstein and 2-point discrimination). Radiographs showed soft-tissue swelling and a lytic process of the distal phalanx in the same location as previously, which was thought to be due to recurrence of the lesion or allograft failure (Figure 2). Because of the unusual characteristics, presentation, and recurrence of this lesion, a magnetic resonance image was obtained, which showed a low-signal homogenous mass with origins from a digital nerve on the T1-weighted images and a high-signal mass on T2-weighted images, consistent with schwannoma (Figure 3).

Because of continued discomfort and progression of the deformity, the patient elected further treatment, which consisted of repeat excision, autologous bone graft from the left distal radius, a neurolysis of the digital nerve, and nail bed reconstruction (Figure 4). Pathological examination showed an Antoni A and Antoni B histological pattern with a dense composition of elongated, spindle-shaped nuclei that was consistent with schwannoma (Figure 5). Postoperatively, he did very well and was pain free 2 weeks later. At 3 months, the digit had greatly improved in appearance, and the patient experienced no limitation of physical activities. At 2 years, he reported relief of symptoms with no swelling or pain in the affected finger and was pleased with the appearance. Radiographs showed complete resolution of the cystic area and cortical erosion (Figure 6).

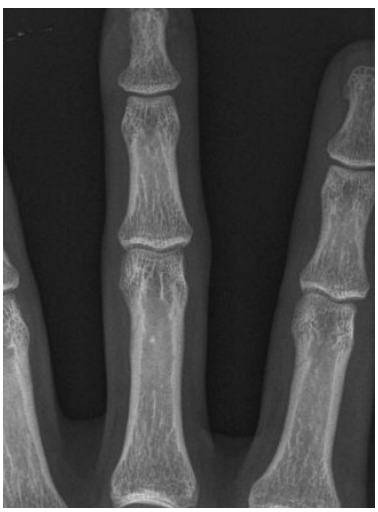

Figure 6. Postoperative posteroanterior radiograph of the left long finger showing resolution of the previous pathological changes.

Discussion

In general, schwannomas have a predilection for the head, neck, mediastinum, and retroperitoneal regions.[1] They generally arise in the sensory as opposed to the motor portion of nerves[5] but can arise in association with any peripheral nerve and along the flexor surfaces of the extremities.[5,8,9] In a large demographic study by Kransdorf,[11] of 895 patients diagnosed with schwannoma, there was an incidence of 8.6% in the hand and wrist. In a series of 21 schwannomas isolated to the hand and wrist, 81% of schwannomas were located on the volar surface commonly involving a branch of the digital nerve.[12]

Conventional schwannomas are composed of 2 organized cell patterns: Antoni A and Antoni B.[1,3,5,8] These patterns are present in all cases of conventional schwannoma in varying proportions. The Antoni A pattern is more organized with a palisade appearance and an elongated, spindle-shaped cellular nucleus. A characteristic appearance in the Antoni A pattern is the Verocay body, which is a circular coalescence of elongated nuclei. The Antoni B pattern is characterized by a diffuse cellular structure with rounded nuclei.

Treatment of symptomatic schwannomas consists of marginal excisional resection with emphasis on identification of the nerve fascicles and excision of the tumor stalk, thus preventing recurrence while preserving the parent nerve.[2,4,13,14] Recurrence is rare, even when the excision is incomplete.[3,6,7] Few studies mention recurrence following excisional resection.[3,7-10]

Bony erosion from a benign schwannoma can also occur because of secondary compression of bone if the schwannoma arises in the vicinity of bone. This phenomenon is rare and has been reported to occur in the spinal canal,[6] proximal phalanx of a finger,[9] or the carpus.[10] In a review of 303 solitary benign schwannomas, only 1 patient had a bony erosion, postulated to be due to local pressure. Again, mass excision and curetting of the bone resulted in complete resolution.[9] In a review of magnetic resonance imaging, only 1 benign schwannoma with a cortical "pressure erosion" was observed, and this was seen only after its recurrence.[7]

The case presented is unique in that despite seemingly adequate excisional biopsy on 2 prior occasions, the schwannoma recurred. Additionally, marked bony erosion of an adjacent bone was present. Pathological examination on each occasion confirmed a benign schwannoma. Ultimately, repeat excision, curetting, bone grafting, and nail bed reconstruction led to resolution and good functional outcome.

Author's Disclosure Statement and Acknowledgements

The authors report no actual or potential conflict of interest in relation to this article.

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