

Case Report

Schwannoma of the digital nerve and reconstruction with reverse-flow dorsal metacarpal artery flap: A case report



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1. Introduction

Schwannomas, also known as neurilemmomas, are tumors of Schwann cells on peripheral nerves. They are quite rare in adult population.¹ Schwannomas are commonly known as solitary masses. But multiple schwannomas may be encountered connected to some certain diseases like schwannomatosis or neurofibromatosis type 2.

Reverse flow dorsal metacarpal artery (DMCA) flap is a fasciocutaneous flap, planned on the perforator arteries located at the second web area of dorsal aspect of the hand.

A case of 65 year-old male patient with a digital nerve schwannoma was presented.

2. Case report

A 65 year-old male patient presented with a large, outgrowing mass on the palmar aspect of third metacarpophalangeal joint (Fig. 1). The mass was first detected on the surface of the palm two years ago and began to grow gradually for the past two years. The

patient does not remember a trauma or an accidental damage to skin continuity.

On the physical examination, 67 × 42 × 37 mm (length, width, height) sized, firm and minimally tender and a heterogeneously appearing mass was revealed. Tinnel's sign was noted positive. Ultrasound revealed a hypochoic encapsulated solid mass but could not detect a connection with any important adjacent neural, bony, tendinous or vascular anatomic structure. Ganglion, neurofibroma, vascular origin sarcomas were among preoperative differential diagnoses and a specimen for tru-cut biopsy was sent. But the diagnosis cannot be provided by tru-cut biopsy.

Despite the fact that superficial location and outgrowing structure of the mass, an magnetic resonance imaging (MRI) was also performed and the mass appeared as hypointense on T1-weighted MRI sequences and hyperintense on T2-weighted MRI sequences (Fig. 2). The patient was decided to be operated after MRI.

Patient was operated under axillary anesthesia. During operation, the mass was well-circumscribed, encapsulated, soft nodule and measured as 65 × 40 × 35 mm. The cut surface was brown-yellow in color with large cystic areas. Nodule was attached to ulnar digital nerve of third digit just distal to bifurcation and sent for pathologic examination. Microscopically, the tumor was composed of biphasic spindle-shaped cells with compact hypercellular Antoni A areas and myxoid hypocellular Antoni B areas. There were foamy macrophages and stromal hemosiderin. Areas of necrosis were not observed. Mitotic figures were very rare. Immunohistochemically, tumor was diffusely positive with S100 and vimentin. Further, desmin, SMA, CD117 and CD34 were negative. But, there were few CD34 positive cells in the pericapsular region. Ki-67 proliferation index was below 3%. With these findings, the case was diagnosed as Schwannoma (Fig. 5).

Preserving the skin envelope superficial to the mass was not possible perioperatively due to fragility of skin covering the mass, possibly related to relatively fast expansion of the skin connected to growth speed of the mass. Thus, the mass was excised en-block with the skin overlying and leaving a 35 × 40 mm skin defect at the palmar aspect of third metacarpophalangeal (MP) joint (Fig. 3). To cover the joint and digital neurovascular bundle with a stable

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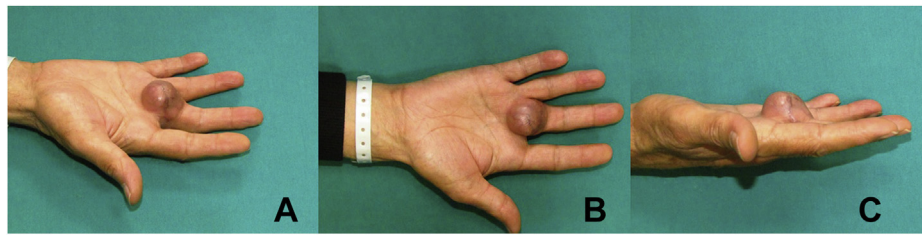


Fig. 1. Preoperative photos of patient. A: Oblique, B: Top, C: Side.

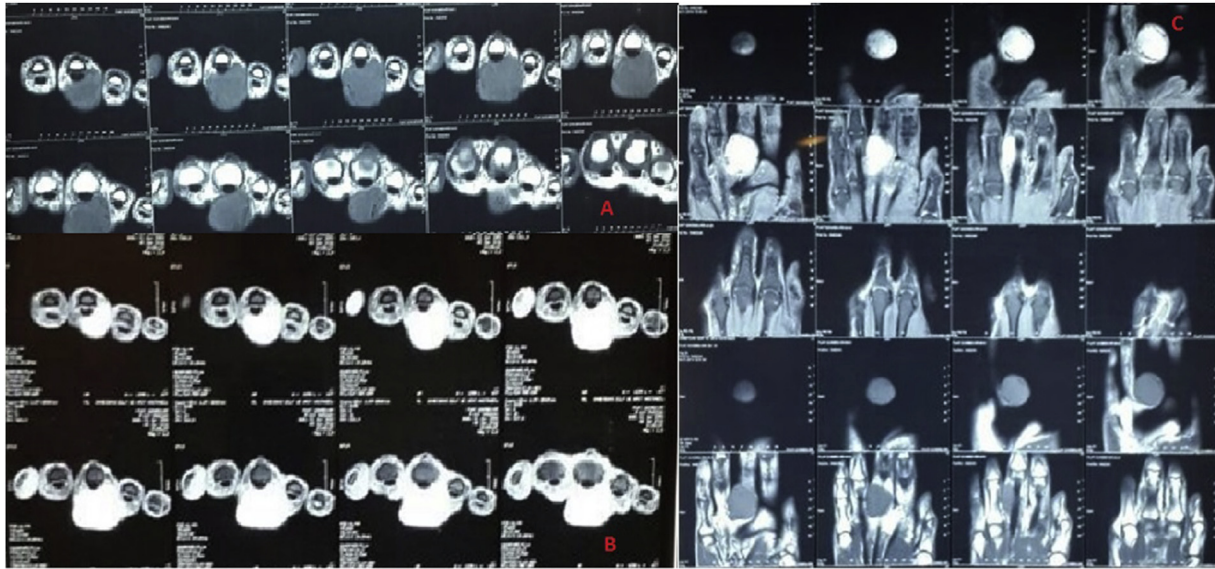


Fig. 2. MRI views of the mass. A: T-1 weighted sequence, B: T-2 weighted sequence, C: T-2 weighted sequence.

tissue, choice of skin grafts was withdrawn keeping in mind that the defect was located on the dominant hand of the patient. Thus, a reverse flow DMCA fasciocutaneous flap on third metacarpal area was planned and the presence of perforator arteries were confirmed with a sterile-probed hand Doppler intraoperatively.

The flap was planned 1.5 cm larger than the defect size, elevated at a plane above the paratenon of extensor tendons, on the dorsal metacarpal artery. The pedicle was ligated distal to the flap tissue and dorsal metacarpal artery was not skeletonized during flap harvesting to avoid damage. After flap dissection from

proximal to distal direction, perforator arteries proximal to MP were preserved. To avoid venous congestion at postoperative period, more than two superficial veins were included underneath the flap tissue.

After rotation of flap on the pedicle around the pivot point, flap tissue reached the defect site easily and was sutured with 5/0 non-absorbable nylon sutures. The donor site of flap was closed primarily due to increased laxity of dorsal skin, probably related to advanced age.

The operation was finished uneventfully. The mass was sent to pathology department to histologic examination.

No paresthesia/hypoesthesia was encountered during early postoperative period based on two-point discrimination test, which was three mm. No complications were encountered in 6-months postoperative follow-up period (Fig. 4).

3. Discussion

Schwannomas, also known as neurilemmomas, are tumors of Schwann cells on peripheral nerves. Usually being encapsulated and benign in nature,¹ they rarely show malign transformation.^{2,3} A case with congenital aggressive schwannoma of a newborn, causing death due to diffuse metastasis at 5 months old was reported in literature in 1964.⁴ Capsule of schwannoma consists of perineurium and deepest layers of epineurium⁵ which permits surgeons to resect tumor without damaging the nerve fibers. Not commonly seen, plexiform subtype of schwannomas may invade neural bundles, making excision more difficult than expected.⁶

Although neurilemmomas account for the most common tumor of peripheral nerves, they are responsible for 5% incidence in adult

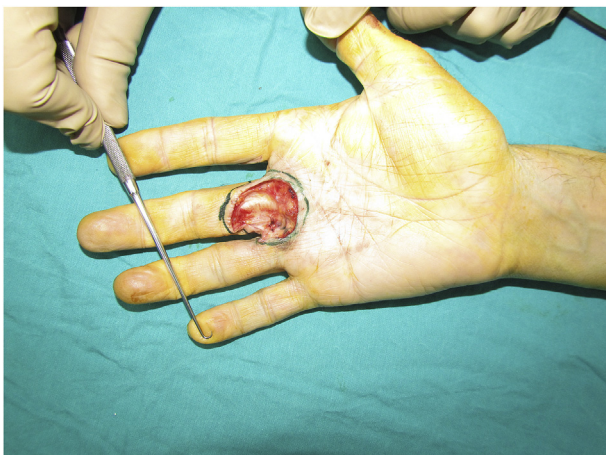


Fig. 3. Perioperative photo of patient.

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