

미세수술을 통하여 수지신경을 압박하는 혈관종을 성공적으로 제거한 증례 보고

고준걸 · 김준혁 · 나은영 · 이준용 · 유 결 · 백상운

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Microscopic Decompression of Digital Nerve Surrounded by Hemangioma: A Case Report

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Hemangiomas are benign neoplasms of endothelial cells origin, rarely found in hand region. Authors report a 62-year-old female with capillary hemangioma of right index finger causing a neuropathic symptom via nerve compression. A space-occupying vascular lesion surrounding the radial digital nerve was revealed in magnetic resonance imaging (MRI), which was removed under microscopic assist. The digital nerve was decompressed consequently. The mass was firmly attached to both the digital nerve and digital artery, requiring a meticulous microscopic dissection to preserve the nerve and artery. Compression neuropathy caused by space-occupying lesions is rare and its diagnosis is often difficult. A microscopic surgical approach can be used to successfully relieve neuropathic pain after proper diagnosis established by diagnostic tools such as MRI as in this case.

Key Words: Microvascular decompression surgery, Hemangioma, Finger

Nerve compression caused by non-neural tumors is rare and hard to diagnose due to its symptoms mimicking the conventional nerve compression syndrome¹. In the upper limb, it is known to frequently occur mainly in the forearm and hand levels. Lipomas and vascular tumors are the main causes and usually affect the medial nerve².

Hemangioma at finger level is very rare and typically asymptomatic³, but may present with tenderness, swelling, and movement restriction, as well as peripheral nerve

compression, including paraesthesia, pain, and paresis. After evaluation through an imaging study, if necessary, decompression through surgical tumor excision is the treatment of choice for pain relief. Microscopic surgery is recommended due to complex structure and sophisticated functioning arrangement of the finger.

We report a rare case in which the symptoms of nerve compression due to capillary hemangioma at the digital level were successfully resolved by microscopic surgical

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decompression.

CASE REPORT

A 62-year-old female presented with severe pain on radial side of the right index finger. She had no peculiar medical or family history, and had experienced no traumatic event. The pain developed since 10 months ago. Ultrasonography performed at local hospital revealed a vascular lesion and magnetic resonance imaging (MRI) was recommended. The patient had endured the pain by warm massaging, but the severe pain impeded her from sleeping. Additionally, tingling sensation had newly developed during the past few weeks, which forced her to visit our hospital.



Fig. 1. Preoperative clinical photo. Mild bulging was observed on radial side of right index finger at proximal phalangeal level. No other abnormalities were observed.

On physical examination, mild bulging of index finger on radial side at proximal phalangeal level was observed. No other abnormalities nor movement limitations were observed (Fig. 1). On MRI, a well-enhanced vascular mass of multinodular contour with about $0.7 \times 0.5 \times 1.0$ cm size was observed on volar side of right index finger at proximal phalangeal level (Fig. 2). The space-occupying vascular lesion was thought to be compressing the radial digital nerve and surgical decompression via mass excision was planned.

Under general anesthesia, with pneumatic tourniquet

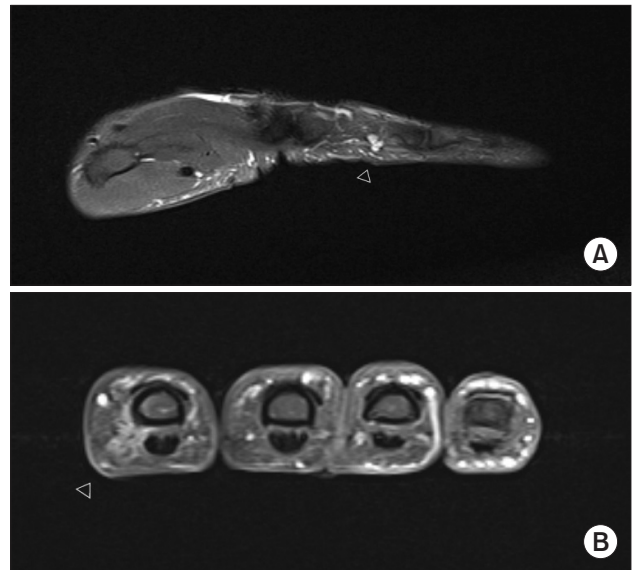


Fig. 2. (A, B) Preoperative magnetic resonance imaging. A well-enhanced vascular lesion of multinodular contour with $0.7 \times 0.5 \times 1.0$ cm size was observed on volar side of index finger at proximal phalangeal level (arrowheads).

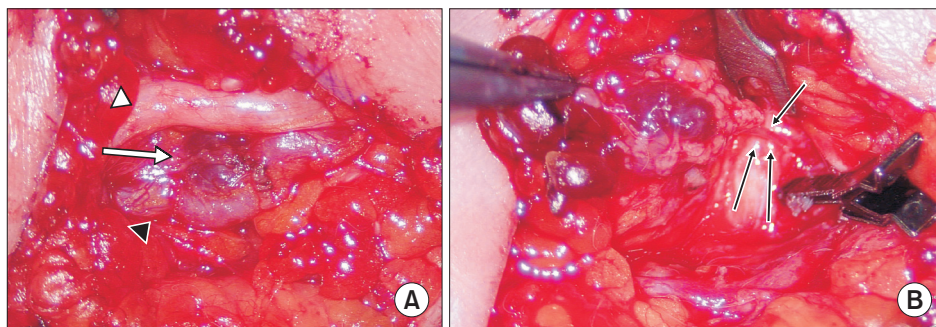


Fig. 3. (A) Microscopic view. Space-occupying vascular tumor between radial digital artery and nerve caused distortion of digital artery and compression of digital nerve (white arrowhead: radial digital nerve, black arrowhead: radial digital artery, white arrow: vascular tumor). (B) Feeding vessels of the vascular tumor were identified up to the A2 pulley level (black arrows: feeding vessel).



Fig. 4. Resected tumor. 0.5×0.4 cm sized vascular tumor was totally excised.

applied, a zig-zag incision was made on proximal phalanx of index finger and dissection was performed under microscopic view. A space-occupying vascular lesion was identified within the radial digital neurovascular bundle (Fig. 3). Digital artery was distorted due to the lesion, and digital nerve trunk and its branches were compressed by the mass.

Meticulous dissection was performed under microscopic view to separate the mass from surrounding tissue while preserving digital artery, digital nerve sheath, and its branches. Feeding vessel of the mass was identified, which was running up to the A2 pulley. The feeding vessel was ligated and the lesion was totally removed (Fig. 4). The final diagnosis of capillary hemangioma was made under pathologic examination. The patient's pain and tingling sensation were relieved immediately after the operation. At 6 month postoperatively, no recurrence of any abnormal symptoms was observed.

DISCUSSION

Hemangioma is benign neoplasm of endothelial cells origin, comprising 2%-6% of vascular tumors in hand region³. It is known that 70% of hemangioma in hand region spontaneously regresses before age of 7, while the remaining hemangiomas that persist in adults are due to repetitive stimulation of venous anomalies showing endothelium, polymorphism, and cell proliferation on

histology⁴. Since hemangiomas are usually asymptomatic, conservative treatment is generally recommended³. However, surgical treatment is necessary for tumors accompanied by neuropathic symptoms such as in this case. Fingers are consisted of complex anatomical structures and sophisticated arrangement of functional tissues, hence making removal of tumor in this area challenging and requiring microscopic assist.

The 5.3%-5.5% of compression neuropathies are caused by space-occupying lesions^{1,2}. In compression neuropathy caused by space-occupying lesion, pain is a common symptom but is not related to the size of the tumor⁵, probably due to slow growth of certain neoplasms permitting enough time for silent adaptation of the nerve to the compression¹. On the other hand, certain tumors such as glomus tumor cause strong pain response in the distributed nerve territories⁶ by causing neuritis and irritation to the compression in pure sensory nerves. Paresis, paralysis, or atrophy caused by nerve compression are difficult to recover.

In tumor-related compressions where no mass is visible or palpable, symptoms mimicking other conventional nerve compression syndromes can lead to misdiagnosis. Thus, all nerve compression syndromes should be evaluated by diagnostic tools despite the cost ineffectiveness. MRI is the test of choice, which can define morphology and location of the tumor, allowing appropriate surgical planning¹. MRI has high sensitivity in diagnosis of lipoma⁷ and Gadolinium-enhanced MRI has been shown to be the imaging technique of choice in the diagnosis of vascular tumors⁸.

Due to similarity of clinical symptoms and signs, tumor-induced compression neuropathies should be differentiated from neuromas. Painful neuromas usually occur as a sequela of nerve injury, mostly after traumatic event. After damage to the peripheral nerve, escape of the nerve fascicle to connect with distal nerve stump leads to neuroma formation⁹. The patient of this case had no traumatic history on right index finger, and preoperative MRI suggested vascular lesions rather than neuroma.

There are no established treatment protocols in hemangioma-induced nerve compression so far, but conserva-

tive treatment tends to fail and complete tumor removal should be the goal¹⁰. In our case with neuropathic symptom at finger level, preoperative imaging revealed a vascular lesion surrounding and compressing the adjacent digital nerve, which allowed us to establish appropriate surgical plan via meticulous dissection under microscopic view. Decompression of the digital nerve by tumor removal immediately alleviated the neuropathic pain.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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미세수술을 통하여 수지신경을 압박하는 혈관종을 성공적으로 제거한 증례 보고

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혈관종은 내피세포로부터 기원한 양성종양의 일종으로, 수부에서는 드물게 발생하는 것으로 알려져 있다. 62세 여자환자로 우측 2수지 요골측의 통증을 주소로 내원하였으며, 시행한 자기공명영상에서 수지신경을 압박하는 것으로 보이는 혈관종이 의심되었다. 수술을 시행하여 요골측 수지신경 및 수지혈관을 압박하고 있는 혈관종을 확인하였으며, 수지신경 및 혈관을 가능한 보존하기 위하여 미세수술을 통해 혈관종을 제거하였다. 공간점유성 병변에 의한 압박성 신경병증은 드문 일로, 정확한 진단에 어려움이 있으나, 본 증례와 같이 자기공명영상을 통한 술 전 평가와 및 미세수술을 이용한 병변 제거 및 신경 보존을 통하여 신경병성 통증을 성공적으로 호전시킬 수 있을 것으로 생각한다.

색인단어: 신경감압, 혈관종, 수지

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