

Post traumatic entrapment neuropathy of digital nerve - A case report and review of literature

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Abstract: We report a case of compressive neuropathy in a digit caused by entrapment in fracture callus of the phalanx. The lesion was resected with rapid relief of symptoms. This cause must be kept in mind in cases of phalangeal fractures which present with digital compressive neuropathy.

Keywords: Fracture callus, digital nerve, entrapment neuropathy

INTRODUCTION

Entrapment is a significant cause of peripheral neuropathy, often resulting in disabling symptoms. Compression can be intrinsic or extrinsic. We report a case of digital nerve compression in the little finger caused by callus of an old fracture of middle phalanx. Following release of nerve and excision of callus the patient made rapid symptomatic relief. The aim of this case report is to present a rare cause of compressive neuropathy of digital nerve.

CASE REPORT

A 28-year-old male presented with 5 months history of swelling and pain of right little finger. Swelling was localized to middle phalanx of the little finger. This was associated with excruciating pain whenever the finger struck a hard object. There was tingling and numbness on the tip of little finger. The individual had sustained fracture of middle phalanx about 7 months earlier, which was managed with splinting for 3 weeks. On examination, there was a 1.0 cm-size hard, tender, oval swelling over the middle phalanx. There was tingling and numbness radiating to tip of little finger on percussion. Tip of the finger was hypoesthetic. Two-point discrimination (2 PD) was 6 mm. X-ray showed an old fracture of middle phalanx with callus formation at the site of swelling (Fig 1). The finger was explored with a Brunner's incision and the radial digital nerve of little finger was exposed. A well defined callus was identified which was causing entrapment of digital nerve (Fig 2). Nerve continuity was maintained. The callus was excised and nerve was made free from all the adhesions (Fig 3). Following

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Fig 1: Showing fracture callus at the base of middle phalanx



Fig 2: Showing entrapped digital nerve at the site of fracture callus



Fig 3: Freed digital nerve with excised callus

surgery the patient made rapid symptomatic relief from his symptoms. He became asymptomatic after 2 weeks and his 2 PD was 4 mm at 4 weeks.

DISCUSSION

Peripheral neuropathy is defined as deranged function and structure of peripheral, motor, sensory, and autonomic neurons, involving either the entire neuron or selected levels^{1,2}. Compression of cutaneous nerves hand are known by the exotic names like Wartenbergs syndrome³, Bowlers thumb⁴, Frisbee finger⁵. Nerve lesions both open and closed types (compression) are more common in the hands and feet than elsewhere in the body. Factors which contribute to compressive neuropathy are closeness of nerves to bone, joint or lack of adequate mobility as they often pass through tough fibrous canal. The digital compressive lesions are often labeled as neuromas in literature^{6,7,8}. However the terms compressive, entrapment or traction neuropathy are often used. These lesions are often associated with “perineural fibrosis” and demonstrates a proliferation of perineural fibrous elements, which first surround and separate the neural elements and eventually cause atrophy or disruption⁵. Neighboring tissues also participate in fibrotic response. The adjacent fibrous tissues, subcutaneous tissues and even skin may be affected. Various causes of irritation of peripheral nerve elements have been implicated. They can be classified as

1. Normal or anomalous restriction, constriction or tethering sites of nerves
2. Repetitive irritation
3. Peripheral neuropathy of any cause
4. Physical or toxic irritation
5. Nearby space occupying or tissue altering lesions such as tumors, masses, foreign bodies and scars.

In our case nearby space occupying lesion in form of fracture callus was responsible for the compressive neuropathy. The compressive neuropathy involving the digital nerve commonly presents with pain and paresthesia in the affected digit. The pain is characteristically sharp or burning in nature, localized over the sensory distribution of the involved nerve. The extent of involvement is related to portion of nerve trunk damaged or impinged. The pain may then progress to altered sensations of tingling, burning or numbness which may become aggravated on finger movement or activity. Often the symptoms can be very exasperating and debilitating causing restriction of finger movements. Deep palpation of nerve may reveal enlargement or elicit tenderness and paresthesia which often reproduces patient’s symptoms. Percussion of nerve causing distal

radiation or paresthesia is a positive Tinel’s sign, while proximal and distal radiation indicates a Valleix phenomenon. Both are indicative of traumatic or compression damage. In absence of trauma intraneural ossification of digital nerve has also been reported which presents as a small tumour like lesion with bony calcification. In such a case the affected segment of nerve is excised and gap is bridged by cable graft⁹.

Management of digital compressive neuropathy is dependent on its etiology. Conservative measures are indicated in lesions arising due to repetitive irritation due to external agent, peripheral neuropathy or physical irritation. Surgery is indicated for space occupying lesion causing nerve irritation. Surgical treatment for a specific compressive lesion usually consists of neurolysis, protection the damaged nerve segment or excision of lesion. The excision of lesion in continuity requires repair of nerve by direct cooptation or by nerve graft. In our case the nerve was found to be intact and the offending agent in form of callus could be excised maintaining the continuity of the digital nerve. This cause must be kept in mind in case of phalangeal fractures which present with neurological symptoms in the affected digit.

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