

Chronic Pain Due to Bilateral Neuroma Mimicking Complex Regional Pain Syndrome on an Amputated Finger Stump: A Case Report

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ABSTRACT

A 62-year-old man presented with chronic pain with an exacerbation for the last 15 days. His left index finger was surgically amputated and the pain was around the base of his index finger which was referred to forearm and other fingers too. A couple of years ago, he sustained an injury to the left index finger and started having pain once the wound was healed. Subsequently exploration was done to relieve pain which did not reduce and for some unknown reason the finger was amputated surgically later. Although the symptoms and signs were mimicking complex regional pain syndrome (CRPS), the other possible causes for the pain such as nerve entrapment and neuromas on the course of the nerve were considered. The surgical exploration was done at the stump and multiple neuromas were found. The neuromas were removed and the wound was closed by carefully burying the nerve endings. Patient had a complete pain relief at the second postoperative day and he had been followed for the next couple of weeks.

Keywords: Bilateral neuroma, Case report, Chronic pain, Neuroma, Pain.

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INTRODUCTION

Chronic pain due to complex regional pain syndrome (CRPS) is very common worldwide. Moreover, it is the diagnosis of exclusion as it is arrived by purely history and clinical signs. Here we present a case which was referred to us as a CRPS, but we could explore the possible cause and managed it well. Although we considered the other possibilities of nerve entrapment on the course of the medial nerve, the X-ray of the hand made us to explore the base and found multiple neuromas which were managed surgically. The patient got complete relief of pain with better activity of the hand. He had been followed for next 3 weeks.

CASE DESCRIPTION

A 62-year-old man presented with severe pain on left hand and forearm for the past 2 years. His pain was exacerbated spontaneously for the last 10 days. Earlier he experienced continuous dull ache throughout the day which used to get aggravated periodically with an intense electric shock-like pain. Pain was not triggered with postural variation or changes in climate. He had a past history of an injury to the left index finger at the proximal interphalangeal joint. That wound got healed in 2 weeks' time with local dressing and medications. He started having pain on the proximal interphalangeal joint almost 1 month after the wound healed. Surgical exploration was redone and the wound was closed as they could not find anything abnormal. Since the pain intensity was the same as prior to exploration, he approached another surgeon who amputated that finger at the proximal phalangeal level leaving a stump of 0.5 cm. The reason for the surgery and the procedural documents detailing the procedure were not given to the patient (Fig. 1).

He had been treated for cardiac ailment with coronary artery disease, and he is on anticoagulants. He is not a known diabetic or asthmatic patient (Fig. 2).

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On examination, it was found that the pain was referring from the base of the left index finger to the other fingers of the same hand and to the forearm. The left upper limb was slightly warm and there were no signs of inflammation. The movement of the wrist or elbow did not induce or exaggerate the pain intensity.

Investigations have been done to find whether there is an entrapment of the median nerve at the heads of the pronator teres muscle¹ or on the course of the nerve till the base of the index finger. Ultrasound examination of the forearm failed to prove any entrapment or neuroma. The X-ray of his affected hand showed osteolytic lesions at the base of the proximal phalanx and head of the metacarpal bone.



Fig. 1: Since preoperatively both flexor and extensor were sutured over the proximal phalanx stump, probably the pressure effect might have caused the phalanx into small sclerosed segments and these segments were limiting the movements apart from neuroma causing pain. All the sclerosed bits were removed preoperatively and the procedure was performed as planned

The differential diagnosis considered with this clinical history and investigations were as follows:

- Complex regional pain syndrome^{2,3}
- Phantom limb pain⁴
- Neuroma of median nerve

Surgical exploration of the stump of the left index finger was done after optimizing the medical status. It was observed that both the extensor and the flexor tendons were sutured on the base of the proximal phalanx in the earlier surgery which was seen in pieces. There were osteolytic lesions of the amputated bone. Neuromas were found on both nerve endings (ulnar and radial side) as it was dissected. The neuromas were excised, sent for biopsy, and the nerve endings were buried. Ray amputation was done to enhance the gripping function of the hand and the wound was closed.

The excised tissues were sent for pathological study, which confirmed multiple neuromas. The patient was discharged as he had complete pain relief except the surgical wound pain. He was followed for the next 2 weeks and the pain disappeared completely.

DISCUSSION

Chronic pain due to neuromas of post injuries and surgical procedures are well-known. This gentleman who presented with an acute exacerbation of a chronic pain on his left hand was more confusing as it mimics CRPS. The intensity of pain was very significant and the trigger factors were indicating a coexisting CRPS. The injury to the left index finger was not very grievous and it healed without any surgical intervention. According to the patient's history, it was the bone which was exposed with the injury but it could be a partial tendon injury which would have healed on its own.

When a peripheral nerve is divided during surgery or injury, specific changes occur, such as axonal sprouting from the proximal stump during regeneration. In the absence of nerve repair, these axons maintain their sprouting in a disorganized manner, in addition to proliferating fibroblasts, inflammatory cells, Schwann cells, and blood vessels, forming a bulb-shaped enlargement called

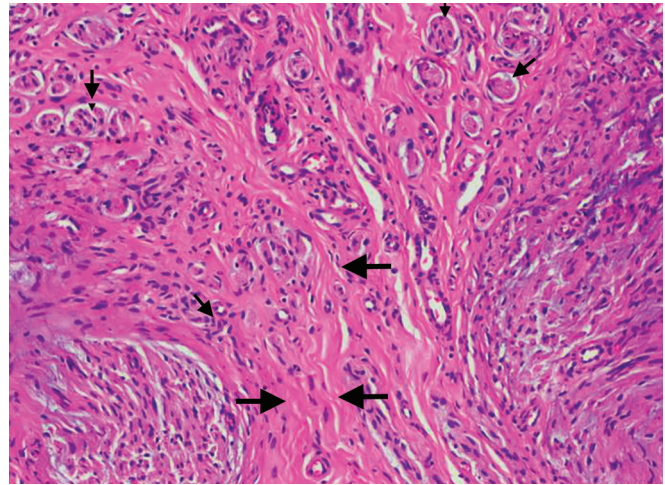


Fig. 2: H&E staining; haphazardly arrange nerve bundles of varying sizes; (short arrows) with interspersed hyalinized collagen (block arrows); H&E $\times 100$ magnification

neuroma.⁵ The incidence of symptomatic neuroma in nerve injury cases who have suffered finger amputation may reach 7.3%,⁶ and most probably in almost all cases it produces disability and a long-standing, distressing disorder.^{7,8} The optimal treatment for painful neuromas is still unresolved and it remains a challenge. Treatment options include symptomatic and specific pain therapy and surgical interventions such as neuroma excision with implantation of a proximal stump in bone or muscle.⁹ Osteolysis is the process of progressive destruction of periprosthetic bone characterized on serial radiographs as progressive radiolucent lines or cavitations at the implant–bone or cement–bone interface.¹⁰ Pain associated with osteolysis often presents after a pain-free interval following the index procedure.¹¹ Because many of the radiographic findings of osteolysis overlap with infection,¹² it is imperative that the surgeon determines the location, severity, and timing of pain as well as the presence or absence of a postoperative pain-free interval during the history and physical examination.¹¹ In our case, the patient presented with chronic pain, which was wrongly diagnosed as CRPS due to the episodes of repeated pain and with the plain radiographs. But as explained above, the main reason in many cases may be of any cause which has to be carefully analyzed based on the history of the patient and also considering the proper imaging techniques of the affected area. As diagnosed in this case report, multiple neuromas and osteolysis are difficult to diagnose as these can overlap with other conditions. Therefore, with proper imaging techniques and regular follow-up with the pain episodes, the diagnosis can be early and patient can be treated accurately.

Plain radiographs may demonstrate progressive and/or extensive gapping at the bone–cement, bone–prosthesis, cement–prosthesis interface or fractures. Although easily obtained, plain radiographic evaluation often substantially underestimates the extent of involvement in the bone and soft tissue and is unlikely to detect small osteolytic lesions.¹³ Moreover, plain radiographs may inaccurately portray the location of the lesion.^{13–16} The three-dimensional computer tomography (CT) has proved to be superior to plain radiographs for the detection and monitoring of osteolytic lesions.¹⁶ The CT scanning can be used in conjunction with plain radiograph when osteolysis is suspected. In addition, magnetic resonance imaging (MRI) is most effective at detecting small lesions

of less than 3 cm³.¹³ Such an approach will identify the extent and location of disease, permitting adequate management.¹³

CONCLUSION

Acute exacerbation of chronic pain can happen at any time. History of previous injury with the possibility of nerve damage and hyperalgesia alone may not be sufficient to call it as CRPS. Multiple neuromas at the cut end of the nerves and irregular edges of the bone which develops as osteolytic lesions also can cause severe chronic pain.

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