

Neuroma of the Hand in Basketball Player: A Case Report

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ABSTRAK Neuroma traumatis adalah pertumbuhan berlebih non-neoplastik dari akson dan sel Schwann di lokasi proksimal gangguan saraf sebagai bentuk regenerasi aksional yang digagalkan. Itu tumbuh dari saraf yang terputus, direseksi sebagian, atau cedera akibat trauma atau pembedahan. Neuroma traumatis pada tangan adalah kelainan langka; itu pertama kali dilaporkan dalam literatur medis pada awal 1811 ketika Odier menggambarkan "tumor saraf" yang berkembang di tempat transaksi saraf. Kami melaporkan seorang pasien laki-laki berusia dua puluh dua tahun menderita neuroma traumatis pada tangan akibat cedera bola basket, yang didiagnosis dengan pemeriksaan klinis dan rontgen polos. Pasien dirawat dengan eksisi bedah neuroma, dan pasien dapat kembali ke olahraga kompetitif pada bulan keempat setelah perawatan bedah.

Kata Kunci: Cedera Bola Basket, Eksisi Bedah, Lesi Non-Neoplastik, Neuroma Traumatis, Saraf Radial.

ABSTRACT Traumatic neuroma is a non-neoplastic overgrowth of axons and Schwann cells at the proximal site of nerve disruption as a form of thwarted axonal regeneration. It is growing from a severed, partially resected, or injured nerve as a result of trauma or surgery. Traumatic neuroma of the hand is a rare disorder; it was first reported in the medical literature as early as 1811 when Odier described "nerve tumors" which develop at the site of nerve transaction. We reported a twenty-two-year old male patient suffered from a traumatic neuroma of the hand due to basketball injury, who diagnosed by clinical examination and plain X-ray. The patient was treated by surgical excision of the neuroma, and patients could return to competitive sport on the fourth months after surgical treatment.

Keywords: Traumatic neuroma, non-neoplastic lesion, radial nerve, basketball injury, surgical excision.

PENDAHULUAN

Traumatic neuroma is a non-neoplastic overgrowth of axons and Schwann cells at the proximal site of nerve disruption as a form of thwarted axonal regeneration.¹ It is growing from a severed, partially resected, or injured nerve as a result of trauma or surgery.² Traumatic neuroma is a very rare disorder; it was first reported in the medical literature as early as 1811 when Odier described "nerve tumors" which develop at the site of nerve transaction.³ It is now clear that this proliferative overgrowth of axons, Schwann

cells, and perineurial fibroblasts is a non-neoplastic, aberrant attempt at reinnervation following disruption of neuronal axons.

Traumatic neuromas usually occur post-surgically but can also follow relatively minor trauma. Although several pathophysiological mechanisms for the development of traumatic neuromas have been suggested, the exact cascade of events remains unclear.⁴ One of the most recently proposed pathophysiology of traumatic neuroma development is that it may be caused by simultaneous regeneration of neural fibers and excessive fibrous tissue proliferation, which results in contraction of nerve fibers within the scar tissue and the establishment of chronic defensive proliferative processes involving nerve fibers and scar fibrous tissue.⁵

The classical presentation is of a painful or tender nodule. Histologically, traumatic neuromas are encapsulated masses, composed of axons unsheathed by Schwann cells surrounded by perineurium. The stroma is characteristically fibrous, but occasionally demonstrates myxoid change. Extension into adipose tissue or skeletal muscle is uncommon, and when present, is usually limited.¹

Traumatic neuroma is somewhat difficult to diagnose. The lump is rarely larger than 2 centimeters and, when suspected, the diagnosis must be confirmed with high-resolution ultrasonography or magnetic resonance imaging. Moreover, related to its rare occurrence, there was no clear strategy to treat the individual patients.

This study presents a case of traumatic neuroma that was diagnosed with limited modality and was successfully treated by surgical excision.

HASIL DAN PEMBAHASAN

A twenty-two-year old male patient was referred to our hospital with pain on his left hand since two months ago. On that moment at a basketball competition, when the patient was

playing, a sudden sharp sensation was appeared on his palm while receiving a ball pass in the game. The patient immediately pulled out the hand and initiated a screening examination on the surface of the hand assuming there was a sharp object like rock or glass on the ball, thereby he stopped playing and give the hand a more meticulous examination of foreign object as the sharp pain did not subside. After repeatedly examine by the other team member and also the competition medical assistant, he was convinced that there is no foreign sharp object in his hand, but the sharp pain remains. He was taken to a nearby clinic, underwent further examination by the general practitioner and treated with some analgesics and antiinflammation medication. Despite the treatment, the pain did not subside. Moreover, he also felt a tingling sensation on the injury site. When examined at our center, the patient felt a radiating pain from the injury site to the

tip of his right point finger. He could still actively move his finger, and there was no loss of sensation in surrounding areas. The patients also initiate to underwent a traditional bone setting treatment and series of physical rehabilitation program for the condition, furthermore he stopped playing basketball due to remaining painful and uncomfortable sensation on the hand.

On physical examination, there was no scar on volar area, the sharp pain persisted at the flexor tendon zone III region, no hyperemia, no swelling (Figure 1A). There was no palpable lump on the injury site, but local tenderness is positive with visual analog scale 2-3. Capillary refill time was under 2 seconds; there was no anesthesia. The wrist, metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints of the right hand have normal range of motion (Figure 1B and 1C).

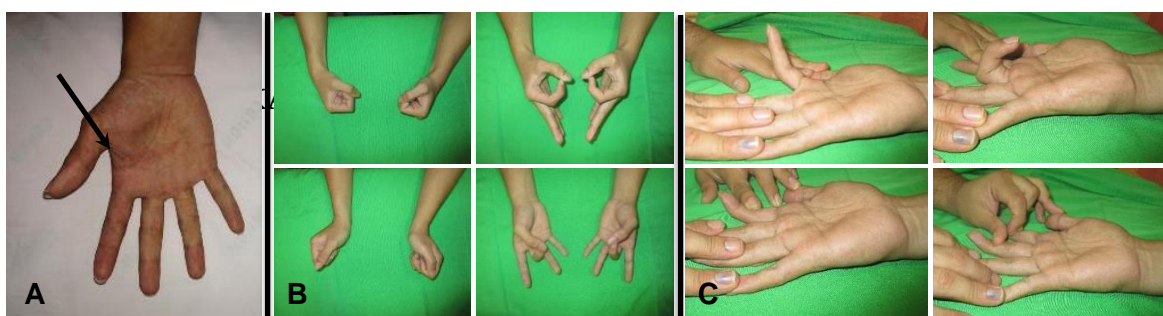


Figure 1. Physical examination of the right hand showed (A) the sharp pain on volar area, at the end of black arrow with (B and C) normal range of movement of the wrist, metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints.

The patient underwent radiographic evaluation twice, at the nearby clinic two months before admission as well as at our Hospital. Both plain X-rays showed no

noticeable abnormality (Figure 2). Furthermore, all parameters in routine blood test were within normal limits.

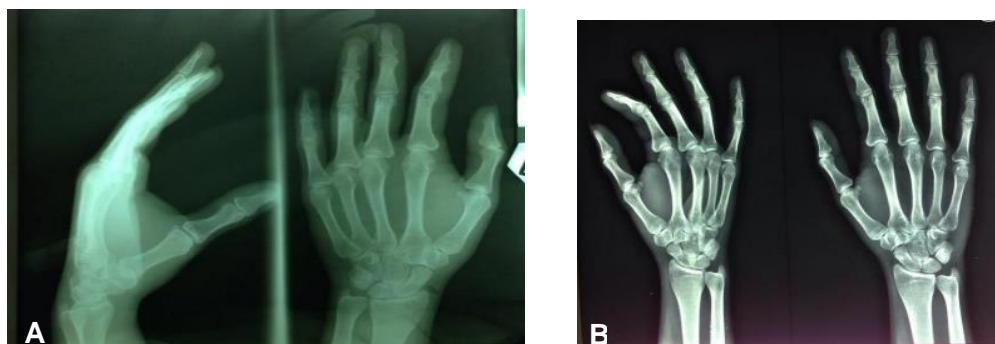


Figure 2. Radiographic examination of the right hand (A) at two months before admission and (B) at the time of admission showed no noticeable abnormality.

From history and physical examination, the patient was diagnosed with traumatic neuroma of the right hand, and we prescribed a series of physical therapy, pain medication,

injection and desensitization therapy with no satisfying results. The team subsequently planned to perform a surgical excision of the neuroma due to failed rehabilitation and

conservative treatment previously.

The patient was in supine position, with his palmar surface faced upward. The incision made 3 cm longitudinally from the medial side of proximal palmar crease. Then, we explored

and identified the involved nerve with its neuroma. From there, we excised the neuroma completely. Subsequently the remaining intact nerve was reconstructed (Figure 3).



Figure 3. Surgical excision of the neuroma, consisting (A) incision, (B) nerve exploration, (C) neuroma excision, and (D) nerve reconstruction.

After surgery, the patient was discharged from hospital on the third day while was given analgesics. Afterwards, the pain as well as the tingling sensation on his hand gradually subsided. The stitches were removed on the second week, therefore he was able to started training on the fifth week and return to competition on the fourth months after the surgery.

SIMPULAN

Traumatic neuromas develop from a non-neoplastic proliferation of the proximal end of a severed, partially transected, or injured nerve as a result of trauma or surgery.² Pain is the most common clinical symptom and is often reproduced with palpation or tapping on the lesion (Tinel sign). A firm soft-tissue mass at a focal pressure site may be apparent. The most common location for traumatic neuromas is the lower extremity after amputation, followed by the head and neck (more than 50% of these lesions are related to tooth extraction). Other sites include the radial nerve and brachial plexus.⁶ This case was a minority those

predilection; our patient had a traumatic neuroma on his hand involving a branch of radial nerve.

To help diagnosing the lesion, computed tomographic (CT) or magnetic resonance (MR) imaging may demonstrate a fusiform mass or focal enlargement with an entering and exiting nerve (spindle type) or only an entering nerve terminating in a bulbous shape (lateral or terminal type) is identified. Lesion of small nerves may not be detected radiographically or may be seen as a non-specific soft tissue mass without an entering nerve. Lesion margin are often well defined, although some irregularity has been seen with ultrasonography. Those characteristics allow traumatic neuromas to be distinguished from other causes of its differential diagnoses including recurrent malignant tumor, osteomyelitis, cellulitis, abscess, bursitis, hematoma, foreign bodies, heterotrophic bone, atrophied stump muscles, and cicatrization.^{7,8} More recently, high-resolution ultrasonography can help the investigation, with the neuroma appears homogeneously hypoechoic, sometimes with small hyperechoic internal bands. No degenerative or necrotic pseudo cystic foci are found.⁹

Our patient did not undergo such radiographic examination. We just conducted a plain X-ray, to find another negative result on the involved hand. Yet, it was enough to bring us to the diagnosis. The patient felt a tingling sensation on the injury site, radiating to the fingertip in accordance with radial nerve innervation. Hence, the patient had a local nervous involvement, either from a compression from surrounding soft tissue or from a direct injury to the peripheral nerve. From physical examination, there was no palpable lump or sign of inflammation, meaning the differential diagnoses of bursitis, cellulitis, and abscess can be excluded. Abnormalities of bone (osteomyelitis, heterotrophic bone), foreign bodies, and hematoma were not considered because of the negative result of plain X-ray. So, we strongly suspected that the patient had a direct involvement of the peripheral nerve, particularly a traumatic neuroma.

Treatment of neuromas of the hand is important because they can be quite debilitating and painful, often preventing patients from continuing with their normal daily activities and includes competitive sports. There are a number of approaches to the painful neuroma, and the treatment plan must be tailored to the individual patient and expected demands. Initial conservative therapy, including acupuncture, cortisone injection, transcutaneous and direct nerve stimulation, and physical therapy has been successful in up to 50% of patients.⁶ More recently, sclerosis of painful stump neuromas under real-time high resolution sonographic guidance by topic instillation of phenol solution has demonstrated to produce a significantly better outcome than other documented treatments.¹⁰ Our patient was treated by surgical excision, which gave more reliable result. However, surgical treatment should only be reserved for patients who fail conservative method or who experience debilitating pain. A meticulous soft tissue handling during the surgery and complete explanation to the patients about the expected outcomes as well as the complication of the surgery are the key of the successful treatment to the patient. Any athlete as well as general practitioner and sports physician should be aware of the possibility of this kind of injury especially in basketball player.

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