

Bilateral Tardy Posterior Interosseous Palsy

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Abstract

We present a rare case of bilateral posterior interosseous nerve palsy secondary to congenital dislocation of the radial head in a 54-year-old male. After an initial trial of orthotic management, he had a successful outcome following a surgical decompression of the nerve on one side.

Keywords: Radial head dislocation; Tardy; Bilateral; Posterior interosseous nerve; PIN; Nerve compression; Fascicular constriction; Peripheral nerve

Introduction

Palsy of posterior interosseous nerve (PIN) is an uncommon condition with very few cases reported in the literature. Various causes for PIN palsy have been described, the commonest being secondary to lipoma with other rare causes of periosteal lipoma [4], inflammatory synovium associated with rheumatoid arthritis, pigmented villonodular synovites (PVNS), post traumatic [7] iatrogenic, direct injuries and following radial head fracture or dislocation in a Monteggia fracture all noted. Although the unilateral tardy PIN palsy has been described in a Monteggia fracture before to the best of our knowledge bilateral tardy PIN palsy have never previously been reported in the literature. We present a rare case of bilateral PIN palsy secondary to congenital dislocation of the radial head [1-4].

Case Report

A 54-year-old right hand dominant chef presented to our clinic with progressive weakness in his left hand for last 6 months and reported an inability to hold a knife upright. On clinical examination, he had mild wasting of upper limb musculature bilaterally and was unable to actively extend his fingers and thumb at the metacarpophalangeal joint (MCPJ). MRC Grade 2 power was noted in the long extensors of the fingers and thumb with weakness of wrist extension. Tenodesis test was normal and there was no sensory deficit in his left hand. On the contralateral upper limb, surgical scars were visible at the wrist and fingers. On further questioning, he admitted to having similar symptoms in the right side 15 years ago which was treated with PIN exploration and tendon transfer surgery. On examination, he had MRC Grade 4 power of wrist and finger extensors on his right side. Bilateral elbow movements showed 20° of fixed flexion deformity with further active flexion to 110° (Range of motion 20° to 110° flexion) with limitation of supination by terminal 30°.

Treatment options

Due to the chronicity of the palsy a similar tendon transfer surgery was offered to the patient. However, he was not keen for that surgery mainly due to the prolonged recovery period experienced previously for his right sided tendon transfer. Alternative treatment, including bracing the elbow in functional position and surgical release of the PIN with or without radial head excision were also discussed. At the patient's request a trial of elbow orthosis, with the elbow held in 90° of flexion and mid prone forearm position was commenced with follow up at 2, 6 and 12 weeks. At 12 weeks the patient displayed some improvement in the power of the wrist and finger dorsiflexors, and was thus advised to proceed with surgical decompression of the PIN. Through an extensile Henry's approach, the radial head and proximal radius were exposed around the distorted anatomy. The PIN was isolated (Figures 1-3) with

no artero-venous malformation noted, and a thick fibrous tissue in close proximity and tethered to the dislocated radial head was observed. Post-operatively the patient was immobilised in the elbow orthosis until satisfactory wound healing at 2 weeks. Gradual elbow mobilisation exercises were started 2 weeks post-operatively and splints were used

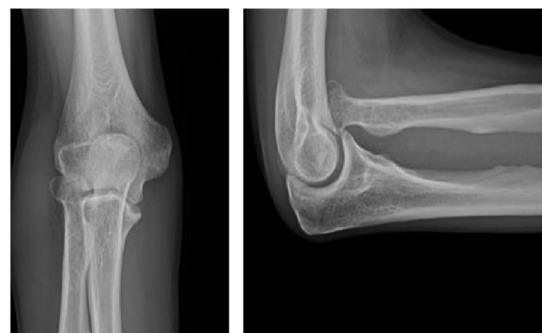


Figure 1: Radiograph of left elbow AP and lateral views showing an anteriorly dislocated radial head.

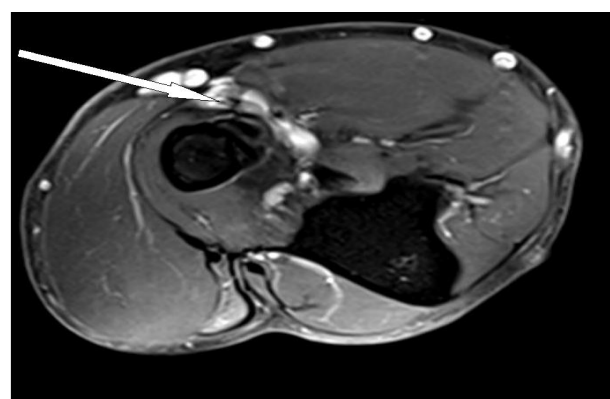


Figure 2: MRI T2 sequence of proximal forearm showing position of PIN nerve surrounded by fibrosis.

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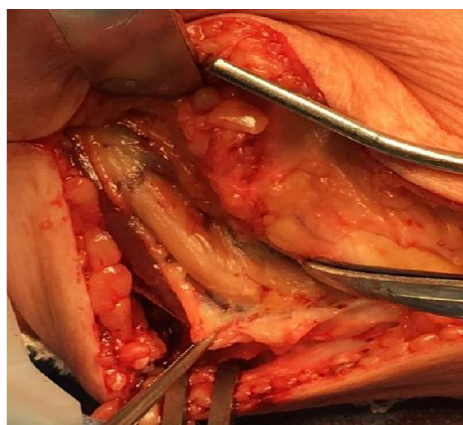


Figure 3: PIN can be identified after dissecting from the surrounding fibrofatty tissue. A pseudo-perineurium has also been released.

only at night. At 3 months follow up, MRC grade 4 power of finger and thumb extensors were noted, with no further improvement or deterioration at 1 year follow up.

Discussion

PIN lesions due to compression at the elbow result in weakness of wrist, finger and thumb extension. Often no loss of sensation occurs due to the nerve's motor function. Elbow pain is one of the most frequent presenting symptoms but was not noted in this case. Lipomas are the most common cause of PIN palsy, [5-9] the second most commonest being iatrogenic or post-traumatic [2,3,6,8,10-14].

Patients can often present very late with these symptoms due to gradual onset with chronic compression causing the palsy. Recovery of PIN after removal of lipoma or a space occupying mass is usually good when performed early. Reports of surgical release within 2 years with full nerve recovery have been reported in the literature. Given that our patient previously required tendon transfer surgery on the contralateral side for fully recovery, we anticipated that full recovery would be unlikely on the left side, particularly as he had already experienced 6 months of symptoms.

Owing to the low signal around the PIN on MRI we underestimated the fibrotic tissue surrounding the nerve preoperatively. This was also backed by the electrodiagnostic studies which showed complete blockade of the nerve and possible interruption in the blood supply to the nerve as the cause.

Tendon transfer surgery was discussed with the patient and a plan of referral to a plastic surgeon was made. However, the patient was reluctant with such a procedure and opted for a more conservative approach. As this was his non-dominant hand, a plan for fitting his elbow with a custom made orthosis allowing mid pronation to supination was made.

With an excellent improvement in his finger extension power we offered our patient an option to proceed with decompressive surgery without radial head excision. Intra-operatively, the anatomy was distorted but the nerve was easily identified with its vasa nervorum engulfed in a thick fibro-fatty tissue as shown in Figure 3. The nerve was decompressed but the fatty tissue was not excised due to its superficial extension. The patient made a good recovery, with no deterioration in extension of his wrist, finger or thumb.

This case demonstrates that surgical decompression of the PIN can be performed in chronic cases as mentioned in the literature. A simple conservative trial with an orthosis may provide a good guide to recovery of the nerve and help reassure the patient. Our management also avoided the need for tendon transfer surgery, saving significant time, anxiety, and operative risks for the patient. We would like to stress that although this was a bilateral and a tardy presentation, recovery was reasonably good with simple decompressive surgery.

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