Bilateral High Radial Nerve Compressions : A Case Report

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Abstract

A 40-year-old woman with bilateral high radial nerve compressions by non-traumatic cause was reported. It occurred first at the right radial nerve which was explored after a period of investigation and conservative treatment. Two constricted sites 2.0 cm apart of the right radial nerve crossed by branches of the radial collateral artery beneath the lateral head of the triceps were found. The constricted sites including tissue in between was resected and replaced with a sural nerve graft. One year later the patient had the same episode on the left side. The operative finding was the same as the previous one. Sural nerve graft was performed after neurolysis had failed. The patient's normal radial nerve function returned in one year. This is the first reported case in the literature of bilateral high radial nerve compressions by branches of the radial collateral artery.

Key word : Radial Nerve, Compression Neuropathy

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High radial nerve compression may be caused by many etiologies but the majority of cases result from trauma[1,2], e.g. fracture of the humerus, unfitted crutch, Saturday night palsy. Nontraumatic cases[3-5] are rare, however, Lotem [6] and Mitsunaga[7] reported the cause being from strenuous triceps muscular effort. Manske[8] reported the cause being from triceps muscular origin. There has only been one report[9] of compression by traumatic aneurysm of a collateral radial

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artery. The authors present an unusual case of bilateral high radial nerve compressions caused by branches of the radial collateral arteries.

CASE REPORT

A 40-year-old Thai woman presented with weakness and inability to extend her right wrist joint and fingers and numbness on the dorso-radial aspect of her right hand for 7 months. Oral medications including corticosteroids had been given by her physician without any improvement. Physical examination revealed loss of sensation on the dorsum of her right hand and motor activity of all muscles innervated by the radial nerve except for the triceps. Electromyography of both radial nerves was performed. The study confirmed complete denervation of the right radial nerve at the level just proximal to the branch to the right brachioradialis muscle and normal left radial nerve. The right radial nerve was explored through a lateral incision of the arm. In the spiral groove, there were two constrictive sites 2 cm apart along the nerve on which two branches of the collateral radial artery were found (Fig. 1). Due to the severe constriction, the nerve had to be resected and replaced with a sural nerve graft. Tendon transfers for wrist and finger extension were performed. Microscopically, the nerve segment showed decreased myelinated fibres with perineural and endoneural fibrosis without inflammatory reaction.

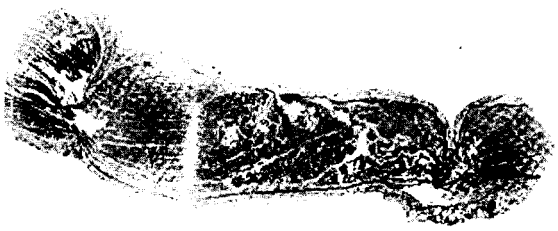

Fig. 1. Axial cut of constricted segment of right radial nerve showing decreased myelinated fibers with perineural and endoneural figrosis (H+E stain, X10).

One year later, she experienced the same symptoms for 2 months on the left side. No history of trauma or over exercise were noted. Physical findings were the same as described on the right. Electromyography showed no response of sensory conduction of radial nerve dermatome on both sides, complete denervation of brachioradialis, extensor carpi radialis and extensor indicis propius on the left side with normal triceps motor unit. Investigations for systemic diseases were carried out, but no abnormality was found.

On surgical exploration, the left radial nerve was found to be affected by the same findings as described on the right. Two constrictive areas 2.2 cm apart were found. Neurolysis was attempted initially, howerer, since the constrictive parts were very narrow, the nerve was resected and replaced with sural nerve graft. Pathological report was myxoid degeneration of the nerve segment.

One year after the second operation, sensation had been regained on the dorso- radial aspect of both hands. Her wrist and finger extensors of both sides had grade V motor power. Electromyography showed normal sensory conduction of the left radial nerve, nascent unit in the left extensor indicis propius and nearly normal motor unit in the extensor digital communis.

DISCUSSION

High radial nerve compression from non traumatic condition is uncommon. The radial nerve passes from the posterior compartment along the spiral groove through the lateral head of the triceps to the antero- lateral part of the arm. Profunda brachii vessels run parallel to its course. The radial nerve pierces the lateral intermuscular septum along with the radial collaterl artery to the elbow. Lotem (6), Manske(8), Misunaga(7) reported high radial nerve compression by the lateral head of the triceps following muscular over exertion. Nakamichi(5) also reported radial nerve entrapment by the lateral head of the triceps. We did not find any history concerning muscular over activity in this patient. Findings from our patient differed from those reports. The compression sites were distal to the lateral head of the triceps. There were 2 constricted sites about 2 cm apart with branches of the radial collateral artery crossing them. We could not find any abnormal growth in these areas. Regarding the operative treatment, we performed nerve graft and tendon transfers in the first operation because the

time of denervation was long (11 months). When the patient had another attack on the left side, we decided to perform the operation earlier with nerve graft without tendon transfers. Her left radial nerve function returned to normal in one year. So we recommend early exploration for compression of the radial nerve, if there is no significant recovery of nerve function after 3 months.

In this report, we presented a patient with bilateral high radial nerve compression by branches of the radial collateral artery. No such report has been described before.

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REFERENCES

1. Mumenthaler M. Lesion of individual nerves in the shoulder – arm region. In: Mumenthaler M, Schliack H. Peripheral nerve lesions diagnosis and therapy. New York : Thieme 1991: 224-34.
2. Dawson DM, Hallett M, Millender LH. High radial nerve compression. In : Entrapment neuropathies 2nd ed. Boston : Little Brown 1990: 200-17.
3. Fernandez E, Pallini R, Talamonti G. Sleep palsy (Saturday- night palsy) of the deep radial nerve. Case report. J Neurosurg 1987;66:460-1.
4. Richardson GA, Humphrey MS. Congenital compression of the radial nerve. J Hand Surg 1989;14: 901-3.
5. Nakamichi K, Tachibana S. Radial nerve entrapment by the lateral head of the triceps. J Hand Surg 1991 ; 16A: 748-50.
6. Lotem M, Fried A, Levy M, et al. Radial palsy following muscular effort. A nerve compression syndrome possibly related to a fibrous arch of the lateral head of the triceps. J Bone Joint Surg 1971; 53 B: 500-6.
7. Mitsunnaga MM, Nakano K. High radia nerve palsy following strenuous muscular activity. A case report. Clin Orthop 1988;234:39-42.
8. Manske PR. Compression of the radial nerve by the triceps muscle. A case report. J Bone Joint Surg 1977;59A:835-6.
9. Rahimizadeh A. Unusual delayed radial Nerve palsy caused by a traumatic aneurysm of a collateral radial artery : Report of two cases. Neurosurg 1992;30:628-30.

รายงานผู้ป่วย 1 ราย ที่มีเส้นประสาทเรเดียลถูกกดทับระดับสูงทั้งสองข้าง

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รายงานผู้ป่วยหนึ่งรายมีเส้นประสาทเรเดียลถูกกดทับระดับสูงทั้งสองข้าง ผู้ป่วยหญิงอายุ 40 ปี มีอาการของเส้นประสาทเรเดียลข้างขวาถูกกดทับมา 7 เดือน ผู้ป่วยได้รับการรักษาโดยใช้ยามาก่อน เมื่อผ่าตัดพบว่าเส้นประสาทเรเดียลส่วนที่อยู่ใต้ต่อของกล้ามเนื้อ triceps ส่วน lateral head มีรอยคอด 2 รอย ห่างกัน 2 เซนติเมตร บนรอยคอดนี้มีแขนงของ radial collateral artery พาดผ่าน ได้ทำการผ่าตัดตัดส่วนที่คอดออกและแทนที่ด้วย sural nerve graft พร้อมกับการย้ายเส้นเอ็นเพื่อช่วยในการทำ extension ของข้อมือ และนิ้วมือ หลังจากนั้นอีก 1 ปี ผู้ป่วยมีอาการเส้นประสาทเรเดียลระดับสูงถูกกดทับอีกที่แขนด้านซ้าย การผ่าตัดพบรอยคอดเหมือนแขนข้างขวาได้พยายามทำ neurolosis แต่ไม่สำเร็จจึงได้ทำการตัดส่วนที่มีพยาธิสภาพออกและแทนที่ด้วย sural nerve graft หลังผ่าตัดผู้ป่วยสามารถใช้มือข้างซ้ายได้ปกติใน 1 ปี

คำสำคัญ : เส้นประสาทเรเดียล, เส้นประสาทถูกกดทับ

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