Femoral and Radial Neuropathy following Vascular Access Cannulation for Hemodialysis

J.		Kalita ^a
U.K.		Misra ^a
R.K.		Sharma ^b
P.		Rai ^b

Departments of ^aNeurology and ^bNephrology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India

Dr. U.K. Misra, Department of Neurology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Raebareli Road, Lucknow, 226 014 (India)

Dear Sir,

Patients with chronic diseases like renal failure are likely to undergo repeated venus cannulations for different diagnostic or therapeutic purposes. Adjacent nerves can be inadvertently damaged resulting in varying degrees of disability. Here, a patient with chronic renal failure who developed femoral and radial neuropathy illustrates this point.

A 32-year male, a patient with chronic renal failure, while undergoing femoral vein cannulation for his first hemodialysis developed severe pain in the inguinal region which was associated with a swelling of 3 × 3 cm in the groin. This was associated with paresthesia which extended to the medial side of the thigh and calf, however there was no significant weakness. An arteriovenous (A-V) shunt was made and later converted to an A-V fistula for maintenance dialysis. After the A-V shunt procedure he noticed diminished sensation in the distribution of the left superficial radial nerve. The patient has been having tingling and numbness in his hands and soles for the past 8 months. He was pale, had pedal edema; BP was 180/110 mm Hg. There was no focal wasting, fasciculation or weakness. The ankle reflexes were absent bilaterally. Pin prick was reduced in the inner side of the leg and foot to the great toe and on the radial area of the dorsum of the hand.

His hemoglobin was 4.6 g/dl, blood urea nitrogen 99 mg/dl, serum creatinine 10.8 mg/dl, ESR 30 mm in the first hour. Antinuclear antibody and rheumatoid factor were negative. Nerve conduction velocity of saphenous nerve though was comparable on the affected and normal side, i.e. 33.6 and 36.0 m/s, respectively, but the amplitude of sensory nerve action potential was reduced on the affected side (0.6 μV) compared to the normal side (1.2 μV). Femoral nerve conduction time by stimulating just above the inguinal ligament and recording from vastus medialis was normal, its latency (amplitude) on the affected side was 9.2 ms (0.9 mV) and on the normal side 9 ms (0.7 mV). Concentric needle EMG of iliopsoas, vastus medialis, vastus lateralis, tibialis anterior and extensor digitorum brevis was normal. The sensory nerve conduction velocity (amplitude) of the left superficial radial nerve by stimulating it 5 cm above the styloid process and recording from the dor-sum of the first metacarpal on the affected side was 44.5 m/s (3.2 μV) and on the normal side 45.6 m/s (9.9

μV; fig. 1). Sural nerve potential was not recordable and peroneal motor conduction velocity was 36.2 m/s (3 mV).

This patient developed partial femoral neuropathy following femoral vein cannulation. In the initial period, pain and paresthesia were present on the anterior and medial side of the thigh and the medial side of the leg, which persisted at the time of examination. The posterior division of the femoral nerve continues as saphenous nerve, the fibers to which seem to have been damaged during the femoral venipuncture in this patient. Isolated neuropathy of the saphenous nerve is rare and occurs mainly following surgical trauma due to compression in the adductor canal [1] and during femoral angiography [2]. Compression by hematoma or ischemic injury due to spasm of the vasa nervosum is possible [3] but unlikely in our patient because of a lack of motor weakness, normal conduction time of the femoral nerve and absence of denervation. In our patient not only the femoral nerve but the superficial radial nerve was also damaged during the venipuncture or preparation of the A-V shunt. Such injuries are rare and may not pose a serious problem to the patient because the symptoms improve with time [4], but preexisting uremic neuropathy may be responsible for persistence of symptoms. In our patient the sensory symptoms in the saphenous

Superficial radial nerve

Saphenous nerve

J10 μV 4 ms

Fig. 1. Nerve conduction study of saphenous and superficial radial nerve showing reduction of sensory nerve action potential on the affected side. A = Abnormal; N = normal.

nerve distribution have persisted for over 3 months after femoral nerve injury. Patients with chronic renal failure are likely to undergo repeated venipuncture for dialysis. Greater care should be taken to save the adjacent nerves by paying attention to their anatomical location.

References

Sunderlands S: Nerve and Nerve Injuries, ed 2. Edinburgh, Churchill Livingstone, 1978; pp 999-1006.

Mumenthaller M, Schliack H: Läsionen peripherer Nerven: Diagnostik und Therapie. Stuttgart, Thieme, 1965, p 287.

Kumar A, Dalela D, Bhandari M, Misra UK, Kher V Gupta A: Femoral neuropathy an unusual complication of renal transplantation. Transplantation 1991;51:1305-1306.

Allison D, Machan LS: Arteriography; in Granger RG, Allison D.I (eds): Diagnostic Radiology, ed 2. Edinburgh, Churchill Livingstone, 1992, p 2228.

© 1995 S. Karger AG, Basel 0028-2766/95/0693-0362 \$8.00/0