신경근육재활 및 전기진단

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

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Usefulness of high-resolution ultrasonography on iatrogenic peripheral neuropathy: A case report

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Introduction

Varicose vein surgery is frequently associated with iatrogenic peripheral nerve damage. Because perineurium-epineurium damage can lead to slow regeneration and permanent sequlae, the distinction between ischemic type injury and direct epineurial-perineurial injury is important in the prediction of prognosis and the decision of treatment. High resolution MRI and electrophysiologic study have been used to identify the neuropathologic change. If surgical treatment of peripheral nerve injury is needed, localization of damaged nerve region can be directly confirmed through operation. Although the ultrasound with 10-15 MHz resolution has detected the site of injured lesion, it has been difficult to identify detailed structure of damaged nerve. We report a case of iatrogenic common peroneal and tibial nerve injury after small saphenous varicose vein surgery without obvious epineurium and surrounding tissue damage in the peripheral nerve injury through high resolution ultrasound.

Case

A 61-year-old male patient without specific medical disease history visited our clinic with right foot drop after varicose vein surgery. He presented with tingling sensation on lateral aspect of right lower leg and weakness of ankle dorsiflexion and extension of toes. Surgery was performed partial removal and ligation of small saphenous vein with a popliteal fossa incision. Four days after surgery, MRC grades were 0/5 in the dorsiflexion of right ankle, 2/5 in the extension of right great toe, 4/5 in the plantarflexion of right ankle and 0/5 in eversion of right ankle. On sensory examination, there was diminished sensation on superficial peroneal, sural area of right extremity. we performed nerve conduction study and electromyography (Table 1a and 1b). The results are compatible with right partial peripheral neuropathy of common peroneal nerve and tibial nerve around popliteal area. We conducted ultrasonography twenty days after surgery (Figure). With the high-resolution ultrasound with 19-22 MHz, we have found that the operation wounds of varicose removal and soft tissue damaged are positioned at 2-4mm interval from peroneal and tibial nerves.

Conclusion

The role of ultrasound in the evaluation of peripheral nerve has been a detection of the sites of damaged nerve or intervening mass lesions such as ganglion or cancers. However, the introduction of high resolution ultrasound not only has been able to identify the location of nerve injury lesion but also might have given some information of damaged epineurium or internal structure of peripheral nerve. The identification of damaged epineurium is one of the factors to determine whether immediate nerve reconstruction is necessary or whether it is expected to recover. Therefore, we expect that high-resolution ultrasound would help to decide the method of treatments and estimate the prognosis in patients with peripheral nerve injury by providing the accurate structural evaluation of the peripheral nerve.

Table 1a. Motor and sensory nerve conduction studies

	Right side				Left side			
Motor	Lat. (ms)	Amp. (mV)	CV (m/s)	F-M lat (ms)	Lat. (ms)	Amp. (mV)	CV (m/s)	F-M lat (ms)
Peroneal	4.1/10.4	0.7*/0.7*	49.2	NE*	3.4/10.2	7.0/6.8	49.8	43.1
Tibial	3.7./12.4	11.1/8.9	48.3	46.0	4.0/11.9	11.6/8.6	53.1	44.3
Sensory	Lat. (ms)	Amp. (μV)	CV (m/s)		Lat. (ms)	Amp. (μV)	CV (m/s)	
Peroneal	NE*				3.3	3.7	42.0	
Sural	NE*				3.2	6.7	44.1	

H reflex	H Lat.	H-M Lat.	M Amp pk Max M	H Amp pk	H/M Ampl
Right(tibial)	33.2	27.8	4.9	0.3	3.27%
Left(tibial)	33.2	27.8	4.9	0.3	3.27%

Table 1b. Needle electromyography

Muscle	At rest		MUPs			Recruit
	Fibs.	PSW.	Poly.	Amp.	Dur.	
Rt. TA.	S.	S.	++.	N.	LD.	Markedly R.
PL.	S.	S.	++.	N.	LD.	Markedly R.
EHL.	S.	S.	++.	N.	LD.	Markedly R.
GCM(medial).	S.	S.	++.	LA.	LD.	Markedly R.
GCM(lateral).	S.	S.	+.	N.	N.	R.
BF(short).	S.	S.	N.	N.	N.	N.
BF(long).	S.	S.	N.	N.	N.	N.
L-PVM.	S.	S.				

*: Abnormal data, Lat: latency, Amp: amplitude, CV: conduction velocity, Amplitude (mV) in motor conduction study, Amplitude (uV) in sensory conduction study MUPs: motor unit potentials, Fibs: fibrillation potentials, PSW: positive sharp waves, Poly: polyphasia, Amp: amplitude, Dur: duration, R: reduced, S: silent, LA: variable amplitude, LD: Short duration. N: normal