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Delayed Radiation induced Lumbosacral Radiculoplexopathy 10 years After Radiation Therapy

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Introduction

Complications after radiation therapy include skin irritation, intestinal discomfort, fibrosis, lymphedema, radiation enteropathy, and radiation-induced polyneuropathy. In radiation-induced plexopathy, initial onset of symptoms may occur as early as 2 to 3 months after radiation therapy and the median onset is approximately 5 years. We report a rare case of lumbosacral radiculoplexopathy 10 years after radiation therapy with cervical cancer.

Case report

14 years ago, a 48-year-old female patient was diagnosed with cervical cancer stage 2b, and 28 radiation therapies were performed. 4 years ago, without any special event, weakness of bilateral lower extremities occurred, and there were no other complications. On physical examination, general atrophy of bilateral lower limb and lumbosacral paraspinal muscles was observed. Manual muscle test showed motor grade 4 in both lower extremities. Sensory deficit did not appear, and deep tendon reflex at both knees and ankles were absent. The muscle strength of upper extremity and deep tendon reflex were normal. Laboratory studies such as complete blood count, aldolase, myoglobin, lactate dehydrogenase, creatine kinase, and tumor markers showed no abnormal findings and cerebrospinal fluid analysis was within normal range. In magnetic resonance imaging, atrophy of lower lumbosacral paraspinal muscles and bone marrow depletion of the L5 and sacrum were observed, but there were no evidence of spinal stenosis, compression of the nerve root, herniated nucleus pulposus, degenerative changes of lumbosacral vertebrae, cancer recurrence or metastasis (Figure 1). The first nerve conduction studies of both upper and lower extremities showed normal findings. On needle electomyography(EMG), myokymic discharges, positive sharp waves and high amplitude motor unit action potentials(MUAP) were seen in gluteus medius, tibialis anterior, gasctrocnemius and lumbosacral paraspinal muscles. The follow-up study was performed 3 years after the weakness onset. There were reductions in amplitude of sensory nerve action potentials(SNAP) in the sural nerves and SNAP of lateral femoral cutaneous nerves was absent compared with the previous test. H-reflex were absent. In needle EMG, the insertional activity was decreased. Myokymic discharges were observed, and decreased recruitment, long-duration, high-amplitude MUAP were observed in peroneal, tibial, and femoral nerve innervated muscles. A positive sharp wave was also observed in the lumbosacral paraspinal muscles. The muscle strengths of both lower extremities was worse than before and there was numbness of both soles. We diagnosed as delayed radiation induced lumbosacral radiculoplexopathy 10 years after radiation therapy.

Conclusion

We experienced a rare case of delayed radiation-induced lumbosacral radiculoplexopathy 10 years after radiation therapy and suspected delayed radiation-induced lumbosacral radiculoplexopathy when bilateral limb muscle weakness occurred.

Table 1. Nerve conduction study and electomyography on both lower extremities.

Nerve conduction study						
Nerve Stimulation (Record)		Amplitude(uV) Distal/Proximal	Conduction Velocity(ms)	Distance(cm)		Latency Distal/Proximal
Motor						
Rt. Tibial (APB)		21800/16100	46	38		4.2/12.4
Rt. Peroneal (EDB)		3900/3800	44	32		3.8/11.1
Rt. Femoral (VM)		6100				6.2
Lt. Tibial (APB)		21500/16100	43	38		4.8/13.7
Lt. Peroneal (EDB)		4100/3900	44	33		3.8/11.3
Lt. Femoral (VM)		5700				5.8
Sensory						
Rt. Supf Peroneal (ankle)		9	46	12		2.6/3.2
Rt. Sural (ankle)		6	42	10		2.4/3.2
Rt. Saphenous (knee)		6	43	14		3.4/3.9
Rt. Lat Fem Cutan		0				
Lt. Supf Peroneal (ankle)		8	44	12		2.8/3.3
Lt. Sural (ankle)		6	41	11		2.7/3.4
Lt. Saphenous (knee)		6	42	14		3.6/4.1
Lt. Lat Fem Cutan		0				
Needle EMG						
			Spontaneous activity		Motor Unit Action Potential	
Muscles		Insertional activity	Fib	Fas	Recruitment	Dur/Amp	Phases
Rt	Gluteus maximus	Decreased	Myokymic discharges		Decreased	Long	Inc
	Iliopsoas	N	0	0	Decreased	Long	Inc
	Tensor fascia latae	Decreased	Myokymic discharges		Decreased	Long	Inc
	Vastusmedialis	N	0	0	Decreased	Long/High	Inc
	Tibialis anterior	N	0	0	Decreased	Long	Inc
	Gastrocnemius	N	0	0	Decreased	Long	Inc
	Biceps femoris short head	N	0	0	Complete	N	Inc
Lt	Gluteus maximus	Decreased	0	0	Decreased	Long	Inc
	Iliopsoas	N	0	0	Decreased	Long	Inc
	Tensor fascia latae	N	Myokymic discharges		Decreased	Long	Inc
	Vastusmedialis	N	0	0	Decreased	Long/High	Inc
	Tibialis anterior	Decreased	0	0	Decreased	Long	Inc
	Gastrocnemius	Decreased	0	0	Decreased	Long	Inc
	Biceps femoris short head	N	0	0	Slightly Decreased	Long	Inc
Rt	Lumbosacral paraspinal	N	++	0			
Lt	Lumbosacral paraspinal	N	+	0			

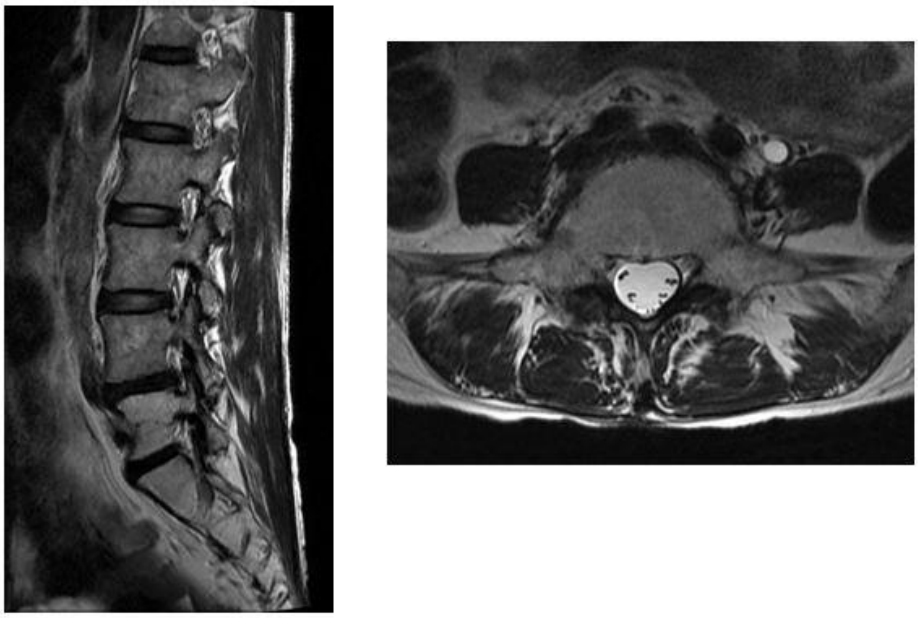

Figure 1. Lumbosacral T2-weighted MRI in sagittal view and axial view with bone marrow depletion and fatty changes in the vertebral bodies with subcutaneous atrophy.