

Backpack Paralysis 3

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– Abstract –

Backpack Paralysis - A Report of 3 Cases -

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Upper extremity numbness, weakness and atrophy associated with the use of a heavy backpack have been reported in military personnel and termed pack palsy. The following characteristics should lead one to suspect this diagnosis. A previously well individual who has used a pack for hours first complains of pain or sensory symptoms in the shoulder or arm. The pain is frequently followed by gradual weakness and atrophy mainly in the shoulder girdle. Physical examination will reveal decreased strength in the deltoid, supraspinatous, infraspinatous and, occasionally, in the wrist extensors. Sensory loss may be present but is less common than the motor weakness. Compression of the upper trunk of the brachial plexus or peripheral nerve supply to the shoulder girdle by backpack straps is implicated as the causative mechanism. But many mechanisms and electrodiagnostic findings are proposed. We report 3 cases of backpack paralysis with history, physical examination and electrodiagnostic study.

Key Words : Backpack paralysis, Brachial plexus injury

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backpack paralysis 3

Backpack paralysis

2
paralysis

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backpack paralysis

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Table 1. Findings of Nerve Conduction Study of 3 Cases

Motor Nerve	Case 1		Case 2		Case 3	
	Amplitude (mV) Right/Left	Latency (msec) Right/Left	Amplitude (mV) Right/Left	Latency (msec) Right/Left	Amplitude (mV) Right/Left	Latency (msec) Right/Left
Median	16.9/16.7	3.0/2.6	13.6/9.8	3.2/3.5	11.1/6.4	3.5/3.3
Ulnar	11.2/11.0	3.2/2.8	12.1/11.8	2.9/2.8	9.9/14.5	3.0/3.0
Radial	5.6/5.3	1.8/1.8	2.3/1.8	1.3/0.8		
Axillary	11.2/10.3	3.0/3.5	5.2/2.3	3.5/3.3	5.2/NR	4.0/NR
Musculocutaneous	11.9/10.4	4.1/4.2	4.0/5.8	4.5/4.6		
Suprascapular			2.6/2.7	2.5/2.7		
Long thoracic					5.5/5.0	3.9/3.9

Sensory Nerve	Case 1		Case 2		Case 3	
	Amplitude (µV) Right/Left	Latency (msec) Right/Left	Amplitude (µV) Right/Left	Latency (msec) Right/Left	Amplitude (µV) Right/Left	Latency (msec) Right/Left
Median	52.9/58.9	2.2/2.3	41.3/59.8	2.6/2.9	19.8/25.8	2.6/2.6
Ulnar	30.5/30.7	2.1/2.0	39.8/42.8	2.4/2.5	15.2/17.2	2.6/2.8
Superficial radial	58.3/62.5	1.3/1.3	59.8/29.7	1.5/1.8	34.5/41.6	1.9/2.0
MAC			14.4/NR	2.0/NR		
LAC			NR/28.5	NR/28.5	16.8/NR	1.1/NR

MAC: Medial antecubital cutaneous; LAC: Lateral antecubital cutaneous; NR: No response

2 13 가 가 가 (scapular winging) 가 가 (Table 2). 가 2 19 가 5 5 45 kg 2~3 가 (Table 1). 가 25.5 cm, 24 cm Tinel (Table 2). : 20 가 가

Table 2. Initial Needle EMG Study and Follow up Study of Case 1

Muscles	Insertional Activity	Initial Study				Follow up Study			
		Spontaneous Activity		MUAP		Spontaneous Activity		MUAP	
		PSWs	Fibs	Phasicity	Rec.	PSWs	Fibs	Phasicity	Rec.
Lt. Extensor carpi radialis		o	o	N/P	R	++	o	N	R/C
Lt. Biceps brachii		o	o	N	C	o	o	N	R/C
Lt. Extensor indicis profundus	Increased	+	+	P	R/S	++	o	N	R/C
Lt. Serratus anterior	Increased	o	o	N/P	R	+++	+++		o
Lt. Triceps brachii	Increased	o	o	N	R/S	+	o	N	R/C
Lt. Flexor carpi ulnaris	Increased	o	o	N	C	o	o	N	R/C
Lt. Flexor carpi radialis		o	o	N	C				
Lt. First dorsal interosseous		o	o	N	R	o	o	N	C
Lt. Supraspinatus		o	o	N	R/S				
Lt. Infraspinatus		o	o	N	R				
Lt. Pronator teres		o	o	N	C	o	o	N	C
Lt. Deltoid		o	o	N	C	o	o	N	R/C
Lt. Latissimus dorsi		o	o	N	C				
Lt. C7 paraspinal muscle		o	o						
Lt. C8 paraspinal muscle		o	o						

PSWs: Positive sharp waves; Fibs: Fibrillations; MUAP: Motor unit action potential; Rec.: Recruitment; N: Normal; P: Polyphasic; R: Reduced; C: Complete; S: Single; Lt: Left

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3:

Backpack paralysis

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Backpack paralysis

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Table 3. Needle EMG Studies of Case 2 and Case 3

Muscles	Case 2				Case 3			
	Spontaneous Activity		MUAP		Spontaneous Activity		MUAP	
	PSWs	Fibs	Phasicity	Rec.	PSWs	Fibs	Phasicity	Rec.
Lt. Biceps brachii	++	++	N/P	R	o	o	N	R/C
Lt. Pronator teres	++	++	N	R/C				
Lt. Deltoid	+++	o	N/P	R/S	+++	+++	P	S
Lt. Extensor carpi radialis	++	o	N/P	R/S	++	++	N/P	R
Lt. Flexor carpi radialis	++	o	N	R/C	o	o	N	C
Lt. Flexor carpi ulnaris	++	o	N	R/C	o	o	N	C
Lt. Pectoralis major	++	o	N	o	o	N	C	
Lt. Triceps brachii	o	o	N	R/C	o	o	N/P	R
Lt. Extensor indicis profundus	+	+	N	R/C	o	o	N	C
Lt. First dorsal interosseous	o	o	N	R/C	o	o	N	R
Lt. Serratus anterior	o	o	N	C	o	+	N	R/C
Lt. Abductor pollicis brevis	o	o	N	C	o	o	N	C
Lt. Infraspinatus	o	o	N	R/C	o	+	N	R/C
Lt. Supraspinatus	o	o	N	R/C				
Lt. Rhomboid					o	o	N	R/C
Rt. Infraspinatus	o	o	N	R/C	o	o	N	C
Rt. Biceps brachii	++	++	P	R				
Rt. Flexor carpi radialis	+++	o	P	R				
Rt. Flexor carpi ulnaris	+	o	N	R/C				
Rt. Pronator teres	++	++	N	R/C				
Rt. Triceps brachii	o	o	N	R/C				
Rt. Extensor carpi radialis	o	o	N	R/C				
Rt. Deltoid	o	o	N	R/C	o	o	N	C
Rt. Pectoralis major	o	o	N	R/C				
Rt. Extensor indicis profundus	o	o	N	R/C				
Rt. Supraspinatus	o	o	N	C				
Rt. First dorsal interosseous	o	o	N	R/C	o	o	N	R/C
Rt. Abductor pollicis brevis	o	o	N	R/C				
Rt. C7 paraspinal muscle	o	o						

PSWs: Positive sharp waves; Fibs: Fibrillations; MUAP: Motor unit action potential; Rec.: Recruitment; N: Normal; P: Polyphasic; R: Reduced; C: Complete; S: Single; Lt: Left; Rt: Right

backpack paralysis 17
 backpack paralysis (upper trunk) (traction)
 가 . Willson³ (pos-
 terior triangle) 5 6
 가 backpack paralysis가
 . White² 2 .
 4 . Goga⁴
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(posterior cord)

backpack paralysis

Backpack paralysis

Backpack paralysis

backpack paralysis

Daubé

Rothner ⁵

backpack paralysis

backpack paralysis

ALICE pack

Bessen ⁶

ALICE

Goga ⁴

Bessen ⁶ 8

pack backpack paralysis

ALICE pack

backpack

backpack paralysis

3

2

1

paralysis

(branch)

(cord)

(compression)

backpack paralysis

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Backpack paralysis

가

Daubé¹⁾ backpack paralysis

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Backpack paralysis

Trojaborg ³

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