

INTRODUCTION

Taser, a type of Conductive Electrical Weapon (CEW), is an electronic immobilization and defense weapon that has been used by law enforcement since 1974 and is used yearly on officers during training so that they understand the power of their instrument. CEWs are battery-operated devices that incapacitate by delivering a series of brief electrical pulses that produce pain and muscular tetany. The most commonly used CEW, the X26 (Figure 1), produces 19 pulses per second. Each 100-ms pulse contains approximately 0.36 J of energy at up to 50000 V.¹⁻³

When officers are tased, the length of shock is typically for a 5 second duration. To prevent falling or trauma, these officers are either kneeling on knees over mats or being held from both arms by fellow officers (Figure 2). The appropriate area for targeting is the posterior mid to low torso.

As part of the police academy indoctrination, recruits are required to undergo specialized training including taser training. Per the literature, CEW's have been associated with several medical complications including contusions, abrasions, lacerations, rhabdomyolysis, ocular injuries, miscarriages, cardiovascular complications and testicular torsion.² We present a unique case of acute lumbar disc herniation resulting in paraplegia, neurogenic bowel, neurogenic bladder and sexual dysfunction as a result of a CEW with no associated fall or trauma and how good athletic premorbid physical condition helped achieve functional and self care independence after completing a comprehensive acute inpatient rehabilitation stay.

FIGURES



Figure 1: Police issue X26 Taser



Figure 2: Controlled Taser Demo

CASE DESCRIPTION



40 year old male presented to the Emergency Department with chief complaint of bilateral lower extremity weakness, saddle anesthesia and urinary retention approximately 2 hours after he was tased during CEW training in the police academy. Lumbar MRI demonstrated a disc herniation with disc extrusion at L4-L5 level extending inferiorly in the spinal canal (similar to the image above). Patient underwent L4-L5 laminectomy, discectomy and fusion prior to admission to our acute inpatient rehabilitation facility. Initial physical exam revealed asymmetric weakness involving L4, L5 and S1 innervated muscles, absent sensation to both soft touch and pinprick symmetrically in L4-S5 dermatomes as well as absent patellar and Achilles tendon reflexes. Rectal exam revealed a flaccid rectal tone with absent deep anal pressure, absent voluntary anal contraction and absent anal wink. With the support of orthotics and assistive devices the patient exhibited functional improvement following the completion of his comprehensive inpatient rehabilitation program, however residual neurogenic bowel and bladder, along with saddle anesthesia persisted. Muscle strength testing progression below.

PROGRESSION OF STRENGTH

	Base RT	Base LT	Admit RT 8/16	Admit LT 8/16	DC RT 9/1	DC LT 9/1	F/u RT 10/7	F/u LT 10/7	F/u RT 1/11	F/u LT 1/11
HF	5	5	5	5	5	5	4	5	5	5
HE	5	5	5	5	1	2	NT	NT	3	3
KE	5	5	5	5	5	5	5	5	5	5
KF	5	5	5	5	3	4	NT	NT	3	4
DF	5	5	1	4	1	5	2	5	2	4
PF	5	5	1	1	0	2	1	1	3	3
EHL	5	5	2	2	0	1	0	3	1	2

DISCUSSION

Use of these devices has been phased into US police forces for obvious reasons. The use of “less than lethal” force is rightfully requested from many citizens across the world and especially from those who have lost family in accidental or intentional shootings when a CEW may have been alternatively utilized. A two thirds reduction in fatal shootings has been shown when CEW usage is not overly restricted.³

An analysis of actual tased criminal suspects, was completed to determine the safety and injury profiles of CEW's. The study demonstrated that significant injuries occurred in 0.25% of cases or 3 of 1201 subjects. Two of the cases were injuries from falls and one from rhabdomyolysis. This further exemplifies the uniqueness of this case of Cauda Equina Syndrome in a controlled tasing officer training demonstration.²

Currently in literature, there are far fewer cases of officers with injury from tasing in training even though this ordinary practice occurs annually in many departments. In 2017 there was a third reported case of traumatic injury from a CEW on a 23 year old male officer with multiple thoracic compression fractures from a CEW demonstration. Similarly, he had no history of seizures, back trauma, or fall either prior to or after the event. It was noted all 3 previous cases were caused by CEW's, had no associated trauma and required no surgical intervention.¹

Currently, literature demonstrates officers are more prone to serious injury than criminals. Our case study demonstrates how use of a taser can cause permanent and devastating neurological deficits, and this fact may warrant further investigation into whether officer tasing is worth the risk of such consequences.

CONCLUSION AND FOLLOW UP

In conclusion this case brings awareness of additional medical complications associated with the use of an conductive electrical weapon including neurological injuries, and the implications these injuries can have on the victim's quality of life and future performance especially when it is used during training sessions.

REFERENCES

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