CASE REPORT

Delayed Cauda Equina Syndrome due to a Migratory Bullet
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ABSTRACT
A 35 years old man presented with Cauda Equina syndrome caused by a bullet migrating down the spinal canal. The patient initially showed no neurological deficits after the gunshot injury but after 15 months he presented again with urinary and fecal incontinence. Lumbo-sacral X-ray showed a bullet at the level of L5-S1 so he was operated under fluoroscopic guidance. Patient's neurological deficits improved after the operation. In authors' opinion it is vital to do follow-up after a gunshot injury to detect migrating bullet. Decompression of Cauda Equina should be done as soon as the neurological deficits occur.


INTRODUCTION
Cauda Equina syndrome is a critical neurological situation which is most often caused by a disc herniation.1 However, it can also be caused by a bullet migrating down the spinal canal. Occurrence of gunshot injuries remaining in the spinal canal is very low and migration of bullets down the spinal canal has been seldom reported in the literature.2

The authors present a unique case of spinal gunshot injury which led to a Cauda Equina syndrome 15 months after the accident due to a migratory bullet.

CASE REPORT
A 35 years old man presented to the department in December 2011 with a gunshot injury on the back. His vital signs were stable with a blood pressure of 120/70 mmHg and a pulse of 100 beats/minute. He was afebrile and the entry wound was found at the level of T12-L1 vertebrae in the midline. No exit wound was seen. Abdominal and per rectal examination were unremarkable. His Glasgow coma scale was intact with a score of 15/15. He was managed with Advance Trauma Life Support protocol. X-ray of the lumbosacral spine showed a bullet at the level of T12-L1. On CT scan, bullet was found to be in the spinal canal. The patient was managed conservatively as he showed no neurological symptoms and was discharged with regular follow-up suggestions.

In March 2012, that same patient presented to the department again with chief complaints of urinary and fecal incontinence. The associated symptoms were saddle anesthesia, bilateral leg pain and paraesthesia. Neurological examination revealed reduced muscle power of anterior tibial muscle (4/5) and bilateral quadriceps (4/5) along with absent ankle reflexes and anal sphincter tone. All these symptoms indicated that the patient was suffering from Cauda Equina syndrome. Lumbosacral X-ray showed the bullet at the level of L5-S1 (Figure 1) and the CT scan confirmed the bullet to be in the spinal canal.

Surgery was undertaken the next day. A midline lumbar incision was done with the patient in prone position on bolsters. The foreign body was identified at L5-S1 level under fluoroscopic guidance. L5 laminectomy and durotomy was done under general anesthesia with controlled ventilation. The bullet was found in the dura and hematoma was seen between spinal roots. Both hematoma and bullets were removed and the skin was sutured with vicryl 2/0. An antibiotic was prescribed for 2 weeks and physiotherapy was recommended. After the surgical intervention, the patient was relieved of saddle anesthesia, and bilateral leg pain was considerably reduced. The patient also showed improvement in urinary and fecal compliance. After 4 weeks, the neurological examination revealed improved power in bilateral quadriceps and anterior tibial muscles.

DISCUSSION
Cauda Equina syndrome consists of a combination of urinary and fecal incontinence along with bilateral leg
weakness and saddle anesthesia. The clinical presentation of Cauda Equina syndrome can be chronic back pain with sciatica or an acute trauma. Intra-dural bullet migration can also cause this syndrome.\(^3\) Bullet movement is associated with many factors such as mass and shape of bullet and time period of injury. MRI is not preferred if the bullet contains ferromagnetic material such as steel. However, MRI is the choice of investigation if it is confirmed that the bullet is of non-ferromagnetic material such as copper.\(^4\) In this case, MRI was not used as a precaution because there was no certainty regarding the material of the bullet.

It has been reported that deaths due to gunshot injuries have augmented immensely throughout the globe.\(^5\) It is also reported that in 2011, target killing occurred almost daily in Sindh, a province of Pakistan. For instance, in August 2011, 213 people were killed and 24 injured due to gunshot injuries.\(^6\) It is also stated that gunshots are a major cause of mortality in committing murders in Pakistan.\(^7\) One of the major etiologies of spinal cord injury is gunshot wound, accounting to 13% to 43% of such injuries. Previous studies also highlight the fact that spinal injuries due to gunshot have higher chances of complete injury than those caused by blunt trauma.\(^8\)

Clinical prognosis of Cauda Equina syndrome improves with early decompression. However, the management of Cauda Equina syndrome still remains controversial. Some support that conservative therapy should be done if there are no neurological symptoms while others believe that early surgical intervention should be done immediately as the foreign body can migrate down the spinal canal resulting in worsening of neurological condition or may lead to infection.\(^3\) Tanguy et al. has reported that conservative therapy improves neurological deficits.\(^9\) However, Moon et al. reported that surgery is the best choice in treating this condition.\(^10\)

In this case, immediate surgery was done as soon as Cauda Equina syndrome was diagnosed. However, the authors opted for conservative therapy initially when the patient was not showing any symptoms relating to Cauda Equina syndrome. Experience suggests that surgery should only be done when patient experiences symptoms. For this, it is recommended that regular follow-ups should be done to detect any neurological deficits as soon as possible. This emphasizes that patient should be compliant to their follow-ups after spinal injuries and should go to neurology department as soon as they experience problems. Hence, doctors counselling can play a pivotal role in the patient presenting early and therefore, leading to early decompression of Cauda Equina syndrome.

This is the first case of intradural bullet migration resulting in Cauda Equina syndrome after a gunshot injury in the setting. The patient developed neurological symptoms 15 months after the initial gunshot injury. Such late presentation of compression of spinal roots by a migratory bullet is very rare in the literature. Hence, this report emphasizes that retained bullet can lead to symptoms years after, so serial imaging must be done.

**REFERENCES**