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Spontaneous Bullet Migration from Cervical to Lumbosacral Spine. Case Report

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ABSTRACT

The spontaneous migration of projectiles in the spinal canal due to gunshot wound are a rare entity, and may be associated with multiple complications in the evolution.

Given the low prevalence, there are no large series registered, so there is no standardized therapeutic protocol.

We made a review of the subject on purpose and presented the case of a 22-year-old patient who suffered a HAF in the cervical spine lodging the projectile at the level of C6-C7, installing a quadriplegia, and in the evolution we observed how the projectile migrated at the lumbosacral level L5-S. The diagnosis, clinical and surgical treatment performed were evaluated.

KEYWORDS: Intraspinal bullet migration, bullet spinal canal, surgical removal.

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INTRODUCTION

The incidence of spinal cord injuries from gunshot wounds in certain geographical areas continues to increase with the natural violence of society. (1,3,9). It is estimated that 17% of spinal cord traumas are caused by this mechanism; being the second most frequent cause of trauma after automobile injuries. (9)

Many patients experience a complete spinal cord injury and the prognosis will depend in part on the initial neurology. (2,3)

Reported cases where the projectile or fragments migrate spontaneously are rare and infrequent. (2,4,5,7) The presence of new neurological symptoms in evolution often leads to suspicion of such migration. (6,8); This is often associated with a progressive worsening of neurological functions. Many times the surgery of extraction of the projectile reverses this symptomatology. (2)

Sometimes the projectile loses energy when it is in free fall, migrating, depending on other forces such as: gravity, increased internal pressure, deglusion, peristalsis and CSF flow. (10)

One of the indications for projectile extraction surgery is the presence of the projectile within the spinal canal, at the level of the horsetail area. (1)

The purpose of this article is to present the case of a patient injured by a firearm with an entrance door at the level of the cervical spine C5, lodging the projectile in the cervical canal at level C6-C7, which migrated spontaneously to the lumbosacral column L5-S1 and inclined us to its subsequent surgical extraction.

CASE REPORT

Presentation of the case of a 22-year-old male patient from Montevideo who works as delivery, treated in the trauma service of the Banco de Seguros Hospital.

In 2023 he suffers a HAF in the cervical spine when delivering an order, entry of the projectile at the C5 level being lodged in the spinal canal at the C6-C7 level with intracanal bone shrapnel. Generating small wound in skin and soft tissues. He was immobilized with rigid collar.

The corresponding imaging Rx, CT, blood analysis was performed in the first instance. Where the location of the projectile is verified.

It is consulted by realization of magnetic nuclear resonance (MRI) which is authorized.

The MRI reported: Soft tissue edema of the left posterolateral sector with a slightly oblique path from back to front and from outside to inside, in relation to the trajectory of the projectile. It is lodged inside the spinal canal in contact with the left lateral margin of the medullary cord at the level of C7. Fracture of the left apophyseal massif of C6, with adjacent osseous edema.

Slight thickening of the medullary cord proximal to the projectile from C4 to C6 is observed, where edema is associated.

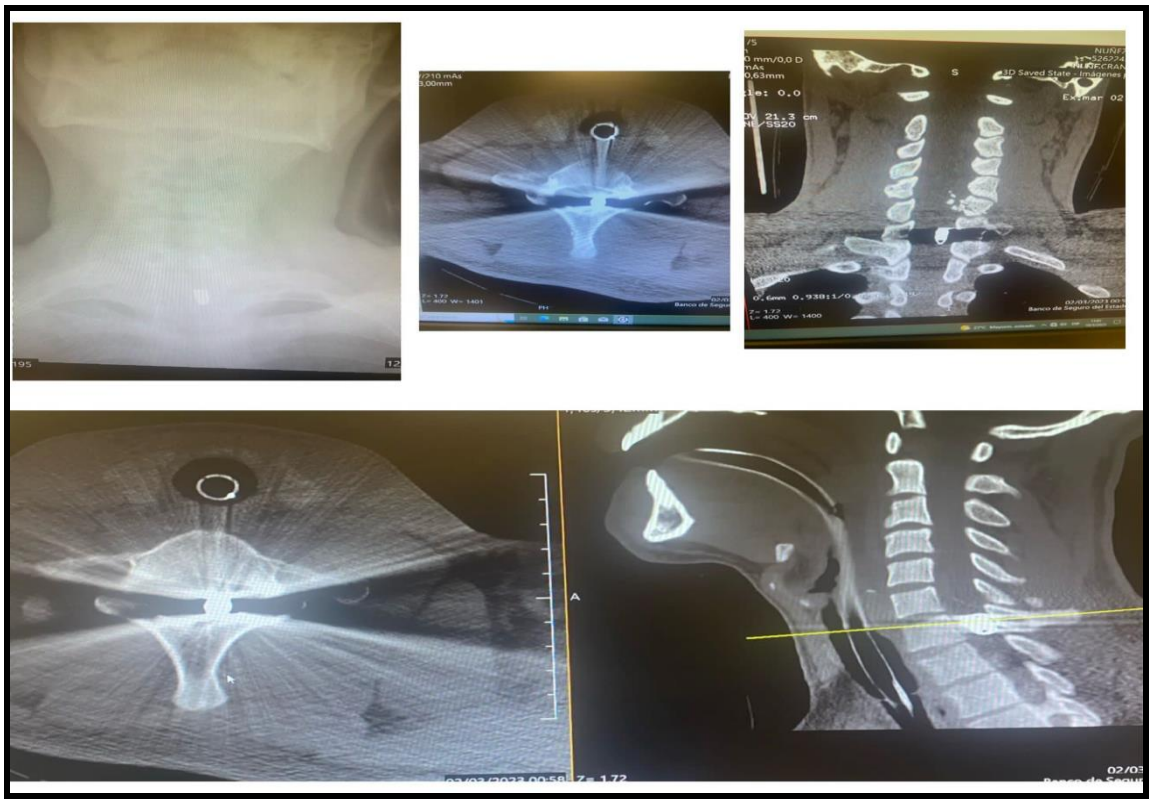

Fig 1: Projectile a. cervical X-rays b. CT cervical spine.
Source: self-made.

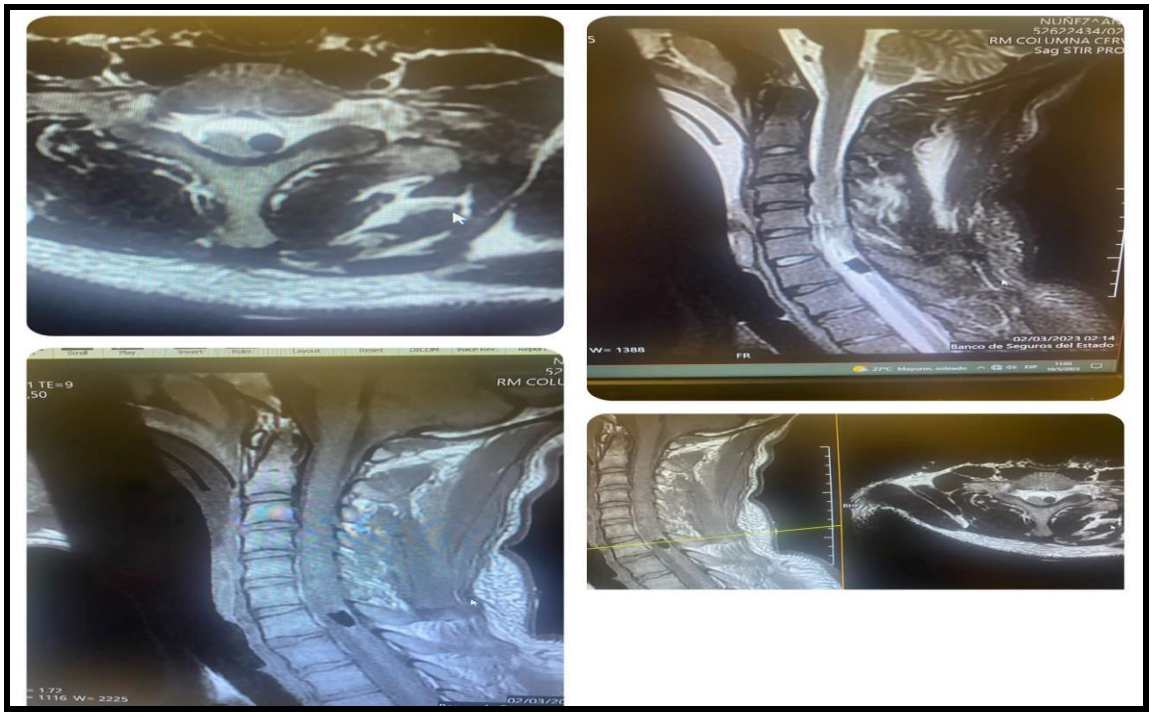

Fig 2: a. MRI Projectile in cervical canal.
Source: Self-made.

TREATMENT

The neurological balance highlights complete spinal cord injury level C4, sensory alteration with anesthesia from T3. He remains 40 days hospitalized in intensive care unit. Where it stabilizes and passes to the general room.

In evolution, the migration of the projectile to the lumbosacral spinal canal is observed. Where it generates the discussion about the withdrawal of the same by: - contact with the cerebrospinal fluid, - possibility of migration again towards proximal high, - pain due to meningeal irritation

and eventual muscle spasms suffered by these patients and high levels of lead in the CSF, it is decided to surgical extraction of the projectile.

Knowing that this is a virgin area of the injury.

A conventional posterior lumbosacral approach was performed.

The level at which L5-S1 could be accessed was visualized radioscopically and was marked or on the skin by means of a dermo graphic pencil. It is made and incision in the midline over the spinous processes. Is dissected the fascia on the spinous. The paraspinal muscles of the spinous processes were dissected subperiosteal to avoid bleeding from the musculature as much as possible. The dissection was carried up to the portion of the vertebra that was observed necessary. We use self-static separators. We proceeded to perform the osteotomy of the posterior arch of L5, respecting the joints, the dural sac was recognized, new radiological control was performed prior to the durotomy, it was cut longitudinally recognizing inside the projectile which was extracted. We proceeded to the hermetic closure of the dural sac, with prolene 6.0, a dura mater sealant was left, Valsalva test was performed to mislead CSF leaks.

A closure was made by planes.

The patient course a postoperative without complications, the discharge was granted continuing the rehabilitation, he was closely controlled in polyclinic with multidisciplinary team, without observing neurological changes in the evolution after 6 months of operating.

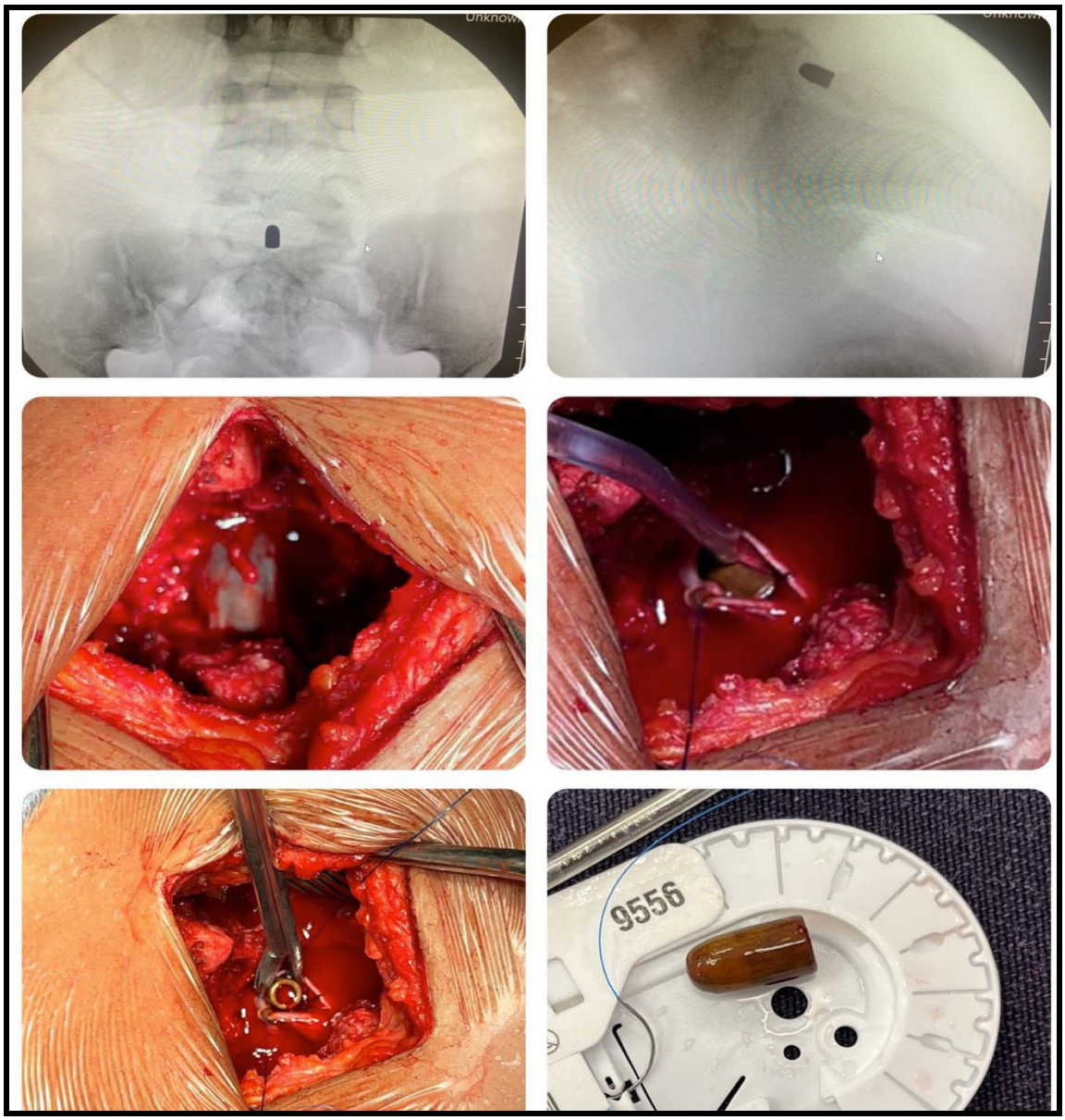

Fig3: a. X-ray Projectile in lumbosacral spine. b. Intraoperatory / projectile.
Source: Self-made.

DISCUSSION

The intraspinal migration to the lumbosacral channel of a projectile although it is rare, its nature is due to factors such as gravity (mainly), magnetism, peristalsis, respiratory dynamics, CSF circulation, among others.

At the time of performing a surgical intervention, intraoperative radiological control is very important since movements of the projectile have been seen with the changes in position of the patient. (3;5)

The handling of projectiles migrating into the spinal canal is controversial. Some authors focus on conservative treatment and others on surgery. (5;7)

Another important aspect when removing a projectile is the risk of infection. Several authors recommend the removal of projectiles made of copper or nickel, which can make abscesses or granulomas after penetrating the CNS. (5)

Lead toxicity is another of the complications reported in the literature, however the little report of cases and evidence does not justify an indication of removal of the projectile and / or shrapnel as soon as possible.

Toxicity when it occurs is typically chronic and insidious. These patients should be closely monitored by monitoring the occurrence of symptoms and quantifying blood copper values. (3;7)

If the values exceed the minimum acceptable of 10 mcg / dl or 25 mcg / dl that constitute the minimum concentration when the toxicity begins to manifest the authors believe reasonable its extraction.

The absorption potential of copper particles from intrasynovial or intradiscal fragments has become a recommendation for routine surgical removal to avoid toxicity for several authors. (11)

Surgical treatment for HFH in the spine is discussed. It should focus on maintaining vertebral stability, reducing neurological deficit, as well as preventing future complications. The vast majority of injuries do not compromise the stability of the spine.

The progression of neurological deficit with spinal compression is one of the few absolute indications of surgery, in these cases early surgery is recommended, improving the prognosis of a cauda equina syndrome and thus prevents the worsening or appearance of new neurological symptoms due to the migration of the projectile, as well as other complications described in the literature: Meningitis, reactionary epidural fibrosis, long-term toxic effects, and the risk of dystrophic intramedullary calcifications (2;3;7)

Surgical management can be individualized to each patient taking into account several factors: hemodynamics, associated lesions, degree of neurological injury, location of the projectile, better clinical control of the hospitalized patient, among others. (7)

I think the interesting thing about this publication is to contribute one more case to the literature on a rare complication such as the migration of a projectile at the level of the spinal canal from the cervical spine to the lumbosacral region.

There is a need for more publications and new quality studies as well as protocols to unify and simplify therapeutic decisions in this type of injury. (9)

CONCLUSION

HFA is a prevalent injury on the rise. At the level of the spine they can cause irreversible neurological damage.

We see different management in these patients according to several variables.

The migration of the projectile or fragments through the intraspinal canal tends to worsen the neurological function which can be reversed many times when it is removed.

Intraoperative radiology as well as the position of the patient help locate the projectile to facilitate its extraction.

Clearly this is a single case and no generalized conclusions can be made based on it.

According to our case and what has been seen in the literature once the projectile shows intracanal migratory characteristics, this could be considered as a relative surgical indication knowing in the future the predisposition to the development of symptoms accordingly.

Author Contribution Note: All the authors listed accept the participation in the paper and they contribute in equal proportions.

REFERENCES

I. Spakauskas, B., Ambrozaitis, K. V., & Kontautas, E. (2007). The bullet in the dural sac. How to catch it? A report of two cases. *Medicina (Kaunas, Lithuania)*, *43*(6), 478–481. https://doi.org/10.3390/medicina43060059

II. Siddiqui, M. I., Hawksworth, S. A., & Sun, D. Y. (2019). Removal of Migrating Lumbar Spine Bullet: Case Report and Surgical Video. *World Neurosurgery*, *131*, 62–64. https://doi.org/10.1016/j.wneu.2019.07.151

III. de los Cobos, D., Powers, A., Behrens, J. P., Mattei, T. A., & Salari, P. (2021). Surgical removal of a migrating intraspinal bullet: illustrative case. *Journal of Neurosurgery: Case Lessons*, *1*(22), 2–6. https://doi.org/10.3171/case21132

IV. Farrugia, A., Raul, J. S., Géraut, A., & Ludes, B. (2010). Ricochet of a bullet in the spinal canal: A case report and review of the literature on bullet migration. *Journal of Forensic Sciences*, *55*(5), 1371–1374. https://doi.org/10.1111/j.1556-4029.2010.01439.x

V. Öktem, I. S., Selçuklu, A., Kurtsoy, A., Kavuncu, I. A., & Paşaoğlu, A. (1995). Migration of bullet in the spinal canal: A case report. *Surgical Neurology*, *44*(6), 548–550. https://doi.org/10.1016/0090-3019(95)00212-X

VI. Rowlinson, S., & Capper, S. (2007). Descent of a bullet in the spinal canal. *Emergency Medicine Journal*, *24*(7), 519. https://doi.org/10.1136/emj.2006.038711

VII. Baldawa, S., & Shivpuje, V. (2017). Migratory low velocity intradural lumbosacral spinal bullet causing cauda equina syndrome: Report of a case

and review of literature. *European Spine Journal*, *26*, S128–S135. https://doi.org/10.1007/s00586-016-4913-6

VIII. Avci SB, Acikgoz B, Gundogdu S. Delayed neurological symptoms from the spontaneous migration of a bullet in the lumbosacral spinal canal. Case report. Paraplegia 1995;33(9):541–2.

IX. Kulcheski, Á. L., Graells, X. S. I., Sebben, A. L., Benato, M. L., & del Santoro, P. G. (2021). Management of spinal gunshot wound injuries. *Coluna/ Columna*, *20*(3), 217–223. https://doi.org/10.1590/S1808-185120212003242926

X. Ben-Galim, P., & Reitman, C. A. (2008). Intrathecal migratory foreign body without neurological deficit after a gunshot wound. *Spine Journal*, *8*(2), 404–407. https://doi.org/10.1016/j.spinee.2006.10.025

XI. Bellabarba, C. (2013). Expert's comment concerning grand rounds case entitled "lead toxicity and management of gunshot wounds in the lumbar spine" (by B. Rentfrow, R. Vaidya, C. Elia, A. Sethi doi:10.1007/s00586-013-2805-6). *European Spine Journal*, *22*(11), 2358–2359. https://doi.org/10.1007/s00586-013-2807-4