Firearm Injury of the Spine; Clinical Experience and Surgical Outcome

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Abstract

Background: Occurrence of firearm injury in the civilian population has been increased in recent years, due to difficulties in management of firearm injuries to spine and debates make it a devastating injuries.

Aim of Study: To discusses the etiology, diagnosis and type of treatment in patients exposed to firearm injury to spine region.

Patients and Methods: This study include 3 male patients exposed to Firearm injury to spine.

1st one 17 year-old exposed to Firearm by assault from others the entrance of projectile from the back paraspinol area opposite S1 level, then it lodge to S1-S2 level left side radiologically.

2nd patient was 37 year-old exposed to Firearm, the bullet entrance from abdomen then lodge at level L5-S1 right side.

3rd case exposed to gunshot injury in ware the entrance was in the back para median opposite D12 and bullet demonstrated radiologically on D12.

All patients were admitted to hospital pre operation assessment, examination and investigation done, diagnostic imaging of spine by X-ray and computed CT-scan.

Results: Regarding the age distribution among 3 patients between 17-45 years, they are males) we see motor and sensory more affected than sphencter, back pain occur in one case only. All patients were surgically treated for extraction of firearm projectiles. No mortality in our study.

Conclusion: The ideal management of firearm injury to spine remains a matter of controversy.

We Recommend: Further studies with larger number of patients.

Key Words: Firearm injury of the spine – Infection – Bullet – Sciatica.

Introduction

OCCURANCE of firearm injury in the civilian population has been increased in recent years, due to difficulties in management of firearm injuries to spine and debates make it a devastating injuries.

Firearm injury to the spine was common matter in military population but now start to increase in civilians due to availability of firearms of low velocity either licensed or illegal representing about 13% to 17% of all spinal injuries [1].

Firearm injury of spine is the third most common cause of spine injuries after fall from height and road traffic accident [2].

Patients and Methods

This study include 3 male patients exposed to Firearm injury to spine, during 2016. Two of them at Hadramoot, Yemen and one patient at Assiut, Egypt.

1st one 17 year-old exposed to Firearm by assault from others the entrance of projectile from the back paraspinol area opposite S1 level, then it lodge to S1-S2 level left side radiologically.

2nd patient was 37 year-old exposed to Firearm, the bullet entrance from abdomen then lodge at level L5-S1 right side.

3rd case exposed to gunshot injury in ware the entrance was in the back para median opposite D12 and bullet demonstrated radiologically on D12.

All patients were admitted to hospital pre operation assessment, examination and investigation done, diagnostic imaging of spine by X-ray and computed CT-scan.
All patients underwent to surgery by general anesthesia.

1st case operated after 1 month post exposed to gunshot on prone position under general anesthesia midline back incision done at level of S 1-S2. Arm X-ray help us on determine the level of bullet to detected the bullet was difficult by several X-ray shots the level is detected but bullet not found we make partial laminectomy foraminotomy then exposed nerve root and catch it by pionit non tooth forceps.

Then imaging by C-R done the bullet appear between the limbs of forceps engulf by tissue adhesion with nerve root, we use small needle of syringe to feeling it, and hearing the sound of needle on bullet, then wide the incision and take it by non-tooth forceps.

2nd case after exposed to Firearm in abdomen goes to general surgery specialist and underwent to laparotomy after 6 months he came complaint of right sciatica under general anesthesia on prone position laminectomy of L5 done then bullet found in neural canal beside the nerve root and compressed it medially and up word after protected the nerve root and retracted it by dissector remove the bullet.

3rd case underwent to operation for reach to the bullet inside the body we use the screw until the reach to it, then pushed bullet to disc space after that catch it by artery forceps then remove it, after that filling the tract by bone ships and fixation one level above and below.

Fig. (1): Show bullet on X-ray.

Fig. (2): (A) Forceps catch nerve and small bullet inside its sheet. (B) Bullet after removed.

Fig. (3): Demonstrate pre and post removed bullet.
Results

Regarding the age distribution among 3 patients between 17-45 years, they are males.

From anatomical localization seen sacral region is the most common site for firearm injury.

In Table (3) we see motor and sensory more affected than sphincter, back pain occur in one case only.

Table (1): The demographic data of patients.

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Sex</th>
</tr>
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<tbody>
<tr>
<td>1st</td>
<td>17 years</td>
<td>Male</td>
</tr>
<tr>
<td>2nd</td>
<td>37 years</td>
<td>Male</td>
</tr>
<tr>
<td>3rd</td>
<td>45 years</td>
<td>Male</td>
</tr>
</tbody>
</table>

Table (2): Anatomical localization of bullet.

<table>
<thead>
<tr>
<th></th>
<th>1st case</th>
<th>2nd case</th>
<th>3rd case</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st case</td>
<td>S1-S2</td>
<td>L5-S1</td>
<td>D12</td>
</tr>
</tbody>
</table>

Table (3): Clinical presentation.

<table>
<thead>
<tr>
<th></th>
<th>1st case</th>
<th>2nd case</th>
<th>3rd case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back pain</td>
<td>Negative</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>Leg pain (sciatica)</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Motor deficit  | Positive | Positive | Negative
Sensory  | Positive | Positive | Negative
Sphincter  | Negative | Negative | Negative

Discussion

Post traumatic infection in firearm injuries commonly occur in the lumbar spine followed by the thoracic and cervical spines in frequency [3].

Lumbar spine is more susceptible to infection in firearm injuries due to bullet pass through gastrointestinal tract [4].

But in our study 2nd case of abdominal injury and laparotomy no seen septic complication not similar to results were reported by waters, Kihtir and Venger, et al. [5,6,7].

Inspite of potential contamination from a perforated organ or hollow viscous, neurosurgical attempt for bullet removal may carry higher risk of complication.

Cerebrospinal fluid leak and dural tear are risk for meningitis.

Broad-spectrum antibiotics should be started immediately, regardless of injury location and the results of wound culture which has limited utility in this setting [8,9].

Avoidance lack of efficacy and steroids should be included in the management plan for patients exposed to spinal firearm injuries [8-10].

To locate the fragments of the bullet and to detect fractures plain radiographic should be done.

This should be followed by computed tomography (CT) must be done after X-ray as it investigation of choice to precisely locate bullet fragment and fractures within spinal canal [8], this similar to plan of treatment of our cases.
References


