



MULTIPLE GUN SHOT INJURY IN AN ADULT: A STAGED MANAGEMENT AND LITERATURE REVIEW

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ABSTRACT The penetrating craniocerebral injuries with the bullets are known to cause major head injury but the injury and subsequent morbidity caused by small pellets cannot be taken as a “green tagged” while triaging. The literature review provides various management guidelines but the management should be individualised to every case which presents to the emergency room. This case report discusses multiple pellets injury in an adult male, with pain as the only symptom and its staged management over the period of six months.

KEYWORDS : Gun Shot, Pellets, Morbidity, Quality Of Life, Chronic Pain

INTRODUCTION:

Air weapon injuries incidence is highest in teenagers ⁽¹⁾. The deep penetration of the tissue by air gun is less frequently seen. So, the trauma or morbidity chances for an individual with an air weapon injury also reduces.

“An airgun can be a rifle, pistol or similar weapon / toy which fires projectiles by means of compressed air or gas. In contrast to this, a firearm burns gun powder or a similar propellant to fire its projectile device. Most airguns use metallic projectiles called as pellets. These are considered low velocity rifles and are generally regarded as safe. These are in wide use for hunting / sports / fun games or pest control and do not require a licence in many countries. However, sometimes these seemingly harmless weapons can cause severe, disabling and even fatal injuries. ⁽²⁻⁴⁾”

There are cases mentioned in the literature with penetrating gun-shot injury, gun-shot injury near the carotid, bullet injury penetrating the base of skull or vital structures which had to be managed as soon as possible after aggressive resuscitation .But, the impact of air weapon injuries (pellets) have often been considered safe and thus managed conservatively.

We present a rare case of adult air gun injury to different parts of body. The patient became symptomatic on admission day 2 and was managed surgically. The pellets were removed from skull and other pellets were left at their site, pertaining to the patient being asymptomatic. Although, the other pellets had to be removed over the period of next six months.

This one of its kind case, throws light on the importance of management of pellet injury with utmost priority , thus not adding to the morbidity of the patient and his/her quality of life .The pain as a symptom cannot be considered a factor lower down in the list while deciding about the management of the patient.

CASE HISTORY:

During a two-day long protest in an urban area, a 45-year-old gentleman was triaged to the green zone in the primary survey, during the mass casualty protocol. Patient was asymptomatic and was vitally stable. No external wound was seen. On the second day of hospital admission, patient started complaining of headache. CT Scan (Head) was done which was suggestive of metallic foreign bodies in frontal bone. X ray Skull was done subsequently.



Fig 1: Imperceptible injury to the scalp



Fig 2: Barely noticeable wound to the upper limb.



Fig 3 : Wound on the chest (on right side) and to the left lower limb



Fig 4: X ray Skull depicting opacities in the frontal bone .



Fig 5: Chest X ray showing tiny opacities in upper and lower zone on right side.

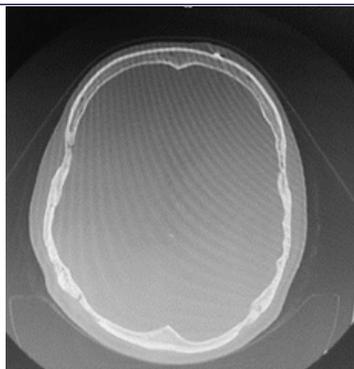


Fig 7 : CT Scan head showing pellet in the frontal bone



Fig 8 : CT Chest confirming the presence of trajectory of the bullet to the chest wall only.

Surgical management of debridement and removal of foreign body was planned. During preparing the patient for surgery, small abrasions and bruises were found on chest, right forearm, skull and left leg.

Chest X ray, X ray of upper limb and lower limb, was suggestive of foreign bodies. The foreign body was removed from the skull during the surgery. Post operatively patient was started on broad spectrum antibiotics and discharged after 5 days. The patient was followed up every 3 months. Patient presented to us after 6 months. There was swelling in the chest wall, around the pellet which was tender. The patient complained of pain, around the swelling in the chest, while lifting weight and doing day to day activities. The pellet had to be surgically removed.



Fig 9 : Wound debridement was done. One of the pellets was deeply impacted into the frontal bone and the other one in the deeper layers of scalp.



Fig 10: X ray skull of the patient (post operative)



Fig 11 : The retrieved pellets from skull and scalp

DISCUSSION:

"Injuries due to bullets / pellets / splinters and other projectiles are broadly divided into high energy and low energy missile injuries depending on the velocity at which the projectile travels. (5)

High energy missiles travel at a speed in excess of 2000 ft/s. These inflict damage on human tissues by the processes of shock wave, temporary cavitation and permanent cavitation. The result of this can be comminuted fractures or a hole formation due to perforative impact. Bone fragments can act as secondary missiles causing much more damage than the original projectile. (6)

Literature reveals that most such cases involve children below 16 years of age with boys more commonly affected than girls. (7,8)

Deep penetration in case of adults has been reported only in few cases. (9)

Our case is an adult with superficial injury to the skull and scalp, with a low energy missile.

All patients with Craniocerebral gunshot injury should undergo non contrast CT scan head irrespective of evidence of penetration of skull on clinical evaluation. (10)

In theory, intracranial bone and metallic fragments that are not removed might be associated with a higher rate of infection, however in a small group of 13 patients, there was no correlation between the presence of retained fragments and the subsequent development of intracranial infection or epilepsy. (11)

In the absence of significant mass effect, surgical debridement of projectile trajectory is not recommended based on evidence Class III. (12)

Many other researchers have also questioned retrieval of pellet and advocated conservative approach particularly where the risks are more than leaving the pellet in situ, reserving retrieval only if a nerve injury or life-threatening vascular injury is present. (13-15)

The case which presented to us, did not have injury to the vital structure but for the management of this case, only guidelines outlined by literature review, could not be taken into consideration as almost all were pointing towards conservative management of the pellets injury.

"Long term sequelae of retained foreign body in Head – Neck area include chronic sinusitis, rhinolith formation, meningitis, chronic pain syndrome and even malignancy. (16-18)

"A case study highlights that deep penetration by Low Energy Missiles is not necessarily limited to children and can occur even in adults. Tissue characteristics of the areas coming in the path of the projectile will decide the depth of penetration and damage. Further, results of thoughtfully decided conservative management may be more rewarding than hasty retrieval of the projectile. (19)

Our case had multiple injuries throughout the body by air gun. Though the injury was superficial, but symptomatic. The patient had severe pain during both the admissions and was adding to the morbidity.

Our case had following -

- a. Multiple pellets injury
- b. Different parts of body were involved
- c. Patient had only one symptom : Pain
- d. No involvement of vital structure

- e. The surgical management was planned as the only symptom (pain) was adding to the morbidity of the patient.

There are case reports on pellet injuries managed conservatively, pellets removed surgically due to proximity to the vital structure and likewise, but all the above factors were present in only one case uniquely which presented to us.

Being one of its kind case, the case was managed surgically in two stages, after patient became symptomatic.

On analysing the case study, we concluded that the air gun can cause deep or superficial injury which will produce symptoms in the patient; may be pain being the first and one of the severe symptom, amongst many others.

We recommend removal of the pellet/s followed by antibiotic coverage and follow up. The case highlights the role of a good triaging and early action along with the role of good clinical examination which can never substitute any investigation. The complication of chronic pain syndrome should be kept in mind in such cases. It should not be considered as a low risk factor while analysing risk benefit ratio. Chronic pain adds to the morbidity of the patient and subsequently to the quality of life.

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