

ANALES DE LA SOCIEDAD ANDALUZA DE OTORRINOLARINGOLOGÍA Y PATOLOGÍA CÉRVICO-FACIAL; 7: 55-61

Selective management of bullet injuries of the neck: to do or not to do?

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Resumen:

El tratamiento de las heridas de bala en el cuello supone un reto. La valoración clínica de la herida y la decisión de explorar o no el cuello ante la ausencia de lesiones viscerales o neurovasculares puede ser difícil. Hemos revisado la bibliografía reciente en relación con las posibles opciones y aportamos nuestras conclusiones. La decisión de explorar o no el cuello depende de la experiencia y de la infraestructura disponible. En un centro mal equipado y con poca experiencia, todos los casos deberían explorarse. En cambio, en una unidad con amplios servicios de traumatología y con personal especializado, puede realizarse una valoración cada 24 horas con apoyo de la radiología y de la endoscopia en los pacientes estables y seguir un determinado modelo selectivo de tratamiento. De este modo se ahorraría en el coste de hospitalización y se evitarían los riesgos de sucesivas exploraciones negativas, tal y como se constata en los estudios revisados, abogando por la intervención quirúrgica en todos los casos.

Abstract:

Management of bullet injuries of the neck can be quite challenging. Clinical assessment of the injury and the decision as to whether or not to explore the neck, in the absence of obvious visceral or neuro-vascular damage, can be difficult. We herein review the recent literature regarding options available and give our conclusions. The decision as to whether or not to explore would depend on the experience and the infrastructure at hand. In an ill-equipped centre with minimal expertise all cases should be explored. However, in a unit with extensive trauma

services and experienced personnel doing careful re-evaluation with 24- hour backup radiology and endoscopic modalities, there could be a role for selective management should the patient be stable. This could result in savings in the cost of hospitalisation and avoid risks of undergoing negative exploration as seen in studies advocating operative intervention in all cases.

Key words: Bullet injury, neck, conservative management

Introduction:

Bullet injuries of the neck are fortunately rare in England and Wales, although there has been an increasing incidence of late. Across the Atlantic, there are 200 million private firearms in the USA today, where gunshot injuries are the second leading cause of mortality for males between 1 and 40 years of age.¹

Knowledge of the path of a bullet and how it terminates is crucial for expeditious assessment and optimal management, which should always be multidisciplinary.

Clinical assessment of the injury and the decision whether or not to explore the neck, in the absence of obvious major visceral or neuro-vascular damage, can be difficult.² This is an area of intense debate amongst various authors. The pendulum of opinion swings from mandatory exploration in all instances, to a wait and watch policy, should the patient be clinically stable, corroborated by diagnostic radiology and endoscopy.

We herewith discuss a patient who presented with this scenario .We briefly review the recent literature regarding management options in this controversial area and give our conclusions.

Case history:

A 10 year-old boy was walking with his friends in a park. He suddenly felt a sting in the neck and blacked out, temporarily. He was promptly rushed to the A & E Department of this hospital. Upon arrival, he complained of pain in the right side of the neck. However he had no difficulty in breathing, feeding, change in voice or weakness of the limbs. General and systemic examination was normal. Local examination revealed a 4 mm penetrating wound with soft tissue oedema in the right anterior triangle of the neck, with localized tenderness. However, the laryngo-tracheal framework was intact, with no subcutaneous emphysema or haematoma. Rest of the ENT evaluation was unremarkable.

A plain radiograph of the neck revealed a pellet just to the left of the laryngo-tracheal framework, with no soft tissue opacity. The cervical spine was normal in contour. (Figs 1 and 2)

Re-assessment revealed no deterioration of the general condition or evidence of any neuro-vascular deficit. An emergency exploration was performed the same day. Intra-operatively, there was minimal superficial trauma. The pellet was found just behind the thyroid cartilage, deep to the strap muscles. There was no significant visceral or neuro-vascular injury. The post-operative course was uneventful. The neck wound healed well. The patient recovered from the episode, without any sequel a and was discharged back to the care of his GP.

Discussion:

Bullet wounds are a rare occurrence during times of peace, though there has been an increasing incidence in the number and severity of this kind of trauma in clinical practice. This could be attributed to the current wave of violence gripping the world. The possible types of wounds are distinct. Principally, one needs to distinguish ricocheting shots from the grazing ones, and those leaving bullets lodged in the body from those with perforating wounds. Gunshot trauma is characterized by an irregular path and can result in a multitude of clinical picture, that influences further management.³

A very significant factor that determines the degree of injury is the course and extent of the 'missile' tract. This in turn is affected more by velocity, than the bullet structure and size and can have distinct features in the civilian and military settings.⁴ Other factors having a bearing on the clinical picture would be internal lacerations, compression of the soft tissues and the temporary cavitation along the path of the projectile.³ Knowledge of these facts is critical for a judicious management of such injuries. However the greatest dilemma is whether or not to explore patients with isolated pellet injury without any major clinical symptoms or signs.

A high index of suspicion is needed while evaluating such patients, especially because clinical and radiological findings may evolve over a period of time.⁵ Assessment of the injury and the decision whether or not to explore the neck in the absence of obvious major visceral or vascular damage can be difficult. Sometimes a potentially fatal injury may not be suggested by the patient's initial condition. Therefore prompt exploration of all bullet wounds need be done.⁶ At other times, bullet impacted in the soft tissues of the neck can encroach eventually into the laryngo-tracheal framework, resulting in airway obstruction, dysphonia and dysphagia, resulting in a life threatening emergency.⁷ This was a distinct possibility in our patient where the pellet was found just behind the posterior border of the thyroid cartilage. Migration of the bullet fragments though rare, should be

included as one of the delayed complications. There has been an instance of intracranial to intra-spinal migration of a retained fragment over 4 years. Metallic foreign bodies should be removed to reduce the risk of infection and effects of dissolved metals.⁸

On the other hand, there have been advocates for conservative management in these circumstances. In a series of 110 patients, selective management resulted in 31 being explored. There was an overall mortality of 2 % comparing favourably with that reported in literature (2- 6 %). It was concluded that a great number of patients could be managed selectively depending on the clinical picture, the site and direction of the trajectory and whether the interval of time between injury and entrance to the hospital is < 6 hours. If initial assessment of the above factors was favourable, with lack of obvious major neck injury, corroborated by diagnostic radiology and endoscopy, a wait and watch policy could be followed.⁹ In a retrospective review of 28 patients with injury to the cervical spine, it was found that there was no advantage to routine exploration in improving neurological recovery.¹⁰ In a series of 6 patients with gunshot wounds without life threatening injuries, there was no difference in the eventual course of events between those explored and those managed conservatively.¹¹ Operative treatment should take place selectively, depending on the severity of the clinical picture.¹²

In our opinion, the decision as to whether or not to explore would depend on the experience and the infrastructure available. In an ill-equipped centre with minimal expertise it would be reasonable to advocate emergency exploration. Isolated pellet trauma like in our patient could be associated with potentially lethal injury, not obvious on clinical evaluation. Besides, there is a risk of delayed migration into the laryngo-tracheal framework or vascular sheath or into the oesophagus. In the present instance, it was difficult to locate the pellet initially. Use of an image intensifier would have mitigated this difficulty, especially because of the nature of the 'missile'. Thus, in a well staffed hospital, with extensive trauma services, experienced personnel doing careful re-evaluation with 24 hour backup radiology and endoscopic modalities, there could be a role for selective management, should the patient be clinically stable and no show signs of major visceral or neuro-vascular trauma. This could result in savings in the cost of hospitalisation and avoid risks of undergoing negative exploration as seen in studies advocating operative intervention in all cases.

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Figura 1: A-P view of Plain radiograph of the neck: Bullet seen embedded just to the left of midline

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Figura 2: Lateral view of plain radiograph of the neck: Bullet seen just anterior to the cervical spine at C₆ - C₇ level