Case Report

Bullet in the Pharynx: Endoscopic Management

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Abstract Gunshot wounds of the neck are diagnostically and therapeutically challenging cases and treatment should be individualized and multidisciplinary. We present an unusual case of bullet injury to the neck. A fourteen-year-old male patient sustained an accidental bullet injury to the submental area of the neck, with no serious injuries to the vital structures. The bullet was found close to the epiglottis, embedded in the pharynx between the base of the tongue and the lower pole of the left tonsil. The patient underwent a successful endoscopic removal with no serious postoperative complications. In this paper, this case is discussed, its presentation and management, together with literature review.

Keywords bullet; pharynx

1. Introduction

The high density of vital structures in the neck makes injury to this region highly morbid and often fatal. It is indeed a rare finding that a bullet’s trajectory passes through the neck region and does not damage any vital structures [6]. Gunshot wounds cause damage both from the bullet itself and from the blast effect. In addition, the path of the bullet is unpredictable [2]. In penetrating trauma the neck is divided into 3 anatomical zones for evaluation and therapeutic strategy purposes. Zone I comprises the area between the clavicle and the cricoid cartilage. Zone II comprises the area between the cricoid cartilage and the angle of the mandible. Zone III extends between the angle of the mandible and the base of the skull. Overall, zone II is the most commonly injured area, and contains the carotid and vertebral arteries, the internal jugular vein, trachea, and esophagus, and this zone is more accessible to clinical examination and surgical exploration than the other zones [5].

Here we present a case who sustained a low-velocity missile injury to the neck affecting zone II. The inlet site is in the submental area, and the bullet was stuck in the lateral side of the pharynx, embedded in the area bounded by the base of the tongue, the lower pole of the left tonsil, and the posterior pharyngeal wall. It was removed under general anesthesia by direct pharyngolaryngoscopy.

2. Case Report

A 14-year-old male patient had an accidental bullet injury into the neck. The nature of the weapon was a low velocity gun used for hunting purpose, as was revealed by the parents. He was admitted to a nearby local hospital, where he received the primary care. He was assessed by the general surgeon who decided to explore the neck. This urgent attempt failed to find the bullet which was only evident by plain X-ray radiograph. He was referred to the author about one week after the first operation. On examination, the inlet site was found in the submental area about 2 cm from the edge of the mandible just to the left of midline, with two incision sites of the previous operation in the left submandibular space which appeared to be slightly swollen (Figure 1). The patient had a feeling of foreign body sensation in the throat and something moving during swallowing. There was no voice change or breathing difficulty. On examination, tongue movement and the throat were normal. Indirect laryngoscopy was suspicious of abnormal bulge in the area of left tongue base, close to the epiglottis. Fiberoptic laryngoscopy showed a mucosal bulge in the pharynx close to the left margin of the epiglottis with some pooling of saliva. Vocal cord movement was normal. Full clinical neurological and vascular assessment was done and no abnormal findings were detected. Plain X-ray of the
neck was not informative to the exact location of the bullet, and computerized tomography (CT) scan was requested. The CT showed the metallic density of the bullet in the area opposite to the third cervical vertebra. It was seen lying transversely, partly in the base of the tongue. It was close to the left margin of the epiglottis and to the lumen of the pharynx (Figure 2).

3. Operative procedure

The patient was subjected to rigid endoscopic examination of the pharynx and larynx under general endotracheal anesthesia. A rigid endoscope was inserted, first a Chevalier Jackson’s laryngoscope adult size was used to have full assessment of the hypopharynx and larynx. Then an anterior commissure speculum 10 mm × 17 cm was inserted to localize the site of the bullet. The bullet was found lodged in the area bounded by the left edge of the epiglottis, left tongue base, lower pole of the left tonsil, and the posterior pharyngeal wall, and photo documentation was done using a rigid Hopkins rod 4 mm 0 degree sinuscope through the lumen of the laryngoscope; see Figures 3 and 4. The bullet was manipulated with the aid of a sucker (Willard Parker Laryngeal suction tube), to release it from the overlying mucosa, and was removed with forceps (Chevalier Jackson’s laryngeal grasping forceps) with no much difficulty; see Figure 5. The patient was kept in hospital for observation under antibiotic cover (ceftriaxone (Mesporin/Mepha) 1 gm/day), and normal saline nebulizer. He was discharged the next day on oral antibiotics (cefuroxime, zinnat/GSK) for one week. The patient was seen one week after surgery and fiberoptic laryngoscopy was done which revealed normal findings.
Figure 4: Further endoscopic examination showing the bullet end exits from the lymphoid tissue of tongue base on the left side of the epiglottis.

Figure 5: The bullet after extraction.

4. Discussion

Gunshot wounds are diagnostically and therapeutically challenging cases and treatment should be individualized and multidisciplinary [9].

Increased suspicion should accompany the examination of patients who have sustained a penetrating neck injuries, and such injuries demand examination by an experienced laryngoscopist [10]. Proper evaluation and treatment of patients with penetrating neck trauma requires a thorough knowledge of cervical anatomy, with nonoperative studies to supplement the physical examination [4]. Gunshot wounds cause injury by three mechanisms: direct tissue injury, temporary cavitation and transmission of shock waves [6].

In our case, there was low velocity bullet injury which affected zone II neck. Controversy surrounds the management of stable zone II injuries, and evaluation should routinely include vascular and esophageal evaluation [2]. In such injuries, exploration of the neck is selective, and physical examination alone may dictate surgical exploration [9].

When the patient was seen in the otolaryngology department, about one week following the incidence, no evidence of neurovascular injury was seen, and fiberoptic laryngoscopy showed the suspected area of the bullet. This was ascertained by a CT scan of the neck that showed with no doubt the exact position of the bullet in the pharynx, in close contact with the supraglottic larynx. Esophagogram or esophagoscopy was unnecessary, as the bullet was situated above the esophageal inlet. Angiography was not requested for the reason that the path of the bullet and the final residence in the pharynx did not affect the major vessels of the neck, which are situated more laterally; besides there were no signs of vascular injury.

Low velocity bullets have a more erratic trajectory; besides, bullets have rotational characteristics that increase the possibility of an unusual and unpredictable course after impact. The rotation and tumbling of the projectile causes increased direct tissue damage [6].
Our patient was exposed to a low velocity bullet injury which entered the submental area in a horizontal direction slightly to the left. It was resisted by the musculature in the submental area, the floor of the mouth and tongue, and finally it came in contact with the posterior pharyngeal wall where further resistance was faced. This made the bullet divert to a more horizontal position in the area bounded by the tongue base, lower pole of the left tonsil, epiglottis, and posterior pharyngeal wall.

We do not know the circumstances that lead to the first exploration, it was better to complete the work-up of the patient including radiology, and consulting the otolaryngologist before embarking to surgery. This explains the failure of the first exploration, which the author believes it was not necessary.

The importance of CT is well ascertained in this case as it showed the exact position of the bullet and made planning for management more precise. Thus nonoperative studies supplement the physical examination in the evaluation of these patients and assist in the operative approach [4].

A search on similar cases was done, and there were some case reports that were reviewed. Most reported cases entailed affection of the larynx by this type of injury. In one case, a 40-year-old man with a gunshot wound in the neck, a piece of bullet was removed from the right supraglottic part of the larynx via direct laryngoscopy [8]. Another reported case entailed a bullet injury to the mouth and face with impaction and migration to the supralaryngeal area where it was removed by forceps from the right pyriform sinus about 6 months after the injury [7].

In one case there was a direct penetration of the larynx by an air gun pellet which was removed via endoscope [11]. Other studies entailed affection of the larynx with bullet injury [1, 3]. None of the above-mentioned studies is similar to our case, bullet in the pharynx.

5. Conclusion

We conclude that the behavior of bullet injury of the neck is unpredictable with many possibilities of outcome. Thorough medical examination, other specialty consultation, and proper work-up of those patients are needed to have the best results.

References