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BULLET INJURY FACE WITH BULLET SWALLOWED IN TO GASTROINTESTINAL TRACT: A RARE PRESENTATION OF 'WANDERING BULLET'

General Surgery

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ABSTRACT

Gunshot injuries are common but the embolization of the bullet is a rare entity[1]. In this condition there is potential lack of early symptoms causing significant delay in diagnosis and treatment. In this paper, we describe a rare case of gastrointestinal bullet embolism where a bullet entered the oral cavity and was swallowed from there in to the GI system. It migrated distally, and eventually lodged in the ascending colon, but there were no signs and symptoms of injury to bowel and patient is doing well. After failure to pass spontaneously it was removed endoscopically.

KEYWORDS

BACKGROUND

Gunshot injuries are common, but embolization of the bullet is very rare.[1]. In case of embolization, there is potential lack of early symptoms leading to a significant delay in diagnosis and treatment of the problem. If such injuries are missed, they cause devastating consequences and may cause death of the patient. The incidence of gun violence has increased in recent times, leading to increased cases of bullet embolism [2]. So in cases where the bullet cannot be found in the vicinity of the entry wound and also the exit wound is not there, should have a high index of bullet embolism.

In this paper, we describe a rare case of gastrointestinal bullet embolism where a bullet entered the oral cavity and was swallowed in to the GI system. The bullet migrated distally, and eventually lodged in the ascending colon, but there were no signs and symptoms of injury to bowel and patient is doing well

CASE

A 45 year old male presented with penetrating injury on the right side of the face just in front of the ear. On examination patient had injury just over the angle of right mandible and patient has difficulty his opening mouth. There was no exit wound present on examination of the patient. Patient`s GCS is 15/15 and the general condition of the patient was stable. Patient was evaluated clinicoradiologically. When no evidence of bullet was found in the head and neck region, the patient was further evaluated for the location of the bullet. Bullet was traced to the right lower abdomen near right iliac fossa.

INVESTIGATIONS

CT scan of face with 3D reconstruction showed the fracture of the right side of the mandible

CT scan of the patient was suggestive of the lodgment of the bullet in the ascending colon.

Upper GI endoscopy showed no significant abnormality.

TREATMENT

Patient was managed conservatively, no abdominal signs were present. Patient was passing flatus and faeces. Patient was orally allowed and observed for spontaneous passage of bullet but it could not pass. Foreign body was removed using colonoscopy

DISCUSSION

Embolism by definition refers to the migration solid, liquid or gas from its point of origin to a distant site. Among the solid particle can be missile, thrombus, or even a medical device can embolise. When a bullet penetrates the body, its movement is stalled and it is carried far away from the location where it would have been had it followed its initial trajectory.

Bullet embolization is rare phenomenon.[3] The kinetic energy of the bullet penetrating the person varies. Sometime it may perforate the intestines and stop after striking the structures in the abdominal wall, Also at times it may come out from the other side.[3, 4, 5]. Movements of GIT(Gastrointestinal Tract) along with the movements of the person contribute to the movement of emboli. The first case of bullet embolism was reported by Thomas Davis in 1834. This case was subsequently cited later, in 1919, by Bland-Sutton [6]. Most of the reports published in English literature are in the form of isolated case reports.

Bullet embolises mostly in the arterial system. Twenty percent of these patients with arterial bullet embolism were asymptomatic, while 66.7% had peripheral ischemia [7,8] The incidence of foreign body emboli in the Vietnam War was 0.3% of cases. [9] Thoracic and abdominal part of aorta accounts for more than 70% of missiles that enter into arterial circulation [10].

In odd events, missile emboli have even been reported to enter arterial circulation through the heart [11–16]. Isolated reports of distal arterial embolization from peripheral arteries have also been published [17, 18]. The embolism is anterograde in the majority of cases. Rare cases of retrograde (venovenous) [19-21] and paradoxical [22] emboli have also been reported.

Cases of delayed embolization has been also reported. The embolization may be delayed up to weeks [23-25]. Bullet in the heart commonly shows delayed embolization, a case of a right ventricular bullet embolism that manifested clinically 4 years after initial insult has been reported in the literature.[26, 27, 28],

In cases where the type and calibre of the gun was known it was found that the bullet with smaller calibre showed majority of emboli [28].

Among the conditions needed for the bullet embolization of the bullet two important ones are low kinetic energy and the diameter of the bullet should be less than that of structure. Embolism is rarely caused by high velocity bullets, as evidenced by its low incidence in war literature [29].

Bullet may also embolise to the urethra leading to obstruction of the urinary tract. There are few cases describing acute urinary retention after late migration of the bullet [30,31] [32]. Case of gunshot in which the bullet caused esophageal injury and got lodged in the stomach and also there are cases of bullets that entered through back and chest and were expelled through the oral and anal orifice[33]. Among the rare cases, a case of bullet migration from the stomach to the intestines. [34]. The “lost” bullets may be considerd to have actually passed uneventfully through the gastrointestinal tract or it may have been coughed out. [35].

As the kinetic energy of the bullet is very high a bullet it is very rare event that it becomes lodged in the intestine although bullet injuries constitute the majority of perforating abdominal trauma and a large part of penetrating trauma [36,37,38]. Although rarely reported, gastrointestinal embolization should be taken into consideration when searching for a missile in the abdomen during an exploratory

laparotomy. In a case in which a bullet halts within the intestines, lack of awareness of the spatial location may result in futile seeking of the missile in the abdominal cavity.

However, in some rare cases of low-velocity ammunition, the bullet course ends within hollow viscus such as the small or large intestine. Such cases are extremely rare and seldom reported.

In the present case, the bullet had penetrated through the right cheek region as shown in the figure 1 and exit wound was not found and on further evaluation the bullet was found in the abdominal wall region without any clinical evidence of abdominal injury . The bullet was never expelled from the body by defecation, probably due to decreased bowel movement as a component of the ileus. Patient did not have any abdominal complaints and was further evaluated by oesophagogastroduodenoscopy and colonoscopy but no abnormality was detected.

Along with low-velocity, small-caliber bullets, bullet fragments or pellets are also prone to embolization. The bullet's movement compounded the initial problem of missed location. Therefore, in rare instances where a bullet is not immediately located, it is important to determine the initial bullet trajectory before its path was possibly changed in the body. To determine this, first the relation of the location of the victim to the shooter must be determined. Thereafter, the axis of the gun barrel must be ascertained. Factors postulated to be responsible for determining distant lodgement sites are (I) power of the missile, (II) caliber and shape, (III) site of penetration into the vascular bed, (IV) effect of gravity especially in the low-pressure venous system, (V) respiratory activity, (VI) force of blood flow, (VII) position of the victim at the moment of penetration of the embolus into the circulation, and (VIII) relative size and angle of the arterial branches [39, 40].

Any foreign body that enter as projectiles can lead to serious infections. A unique case of Clostridium difficile subacute bacterial endocarditis was reported after a bullet injury.[41] [42]. The argument for bullet extraction after bowel injury includes a decreased risk of sepsis. Sarmiento et al. [43] found that in case of abdominal Gunshot wound, if colonic injury with retained bullet caused more shock when compared to the cases in bullet was removed and tissue was debrided. It was also documented that in cases of spontaneous exit of bullet after injuring colon (in this study the exit was not via embolism in any of the cases, but rather through-and through penetration), the internal tract created by the bullet should thoroughly washed and tissue is to be debrided.

Another consideration, which Sari et al. [44] discuss, is elevated blood lead from gunshot injuries that result in ingestion. In cases in which the bullet was present in the gastrointestinal tract from where lead was absorbed in blood and it resulted in the increased level of lead in blood even after 3 years after injury.

A very high index of suspicion is of utmost importance to identify a missile embolus. Accounting for all bullets and all bullet wounds allows for a basic reconstruction of each bullet's trajectory, thus identifying organs and tissues at risk of damage. If the number of entry wounds does not equal the number of exit wounds or the clinical signs or symptoms and radiologic imaging do not correlate with the injury, the possibility of bullet embolism should be entertained. Unexplained clinical findings should also trigger the suspicion of missile embolism. Although the bullet rule is a helpful concept, there are well-documented exceptions to the rule. Two bullets fired in unison as tandem bullets from a handgun entering the body through the same entrance wound, but leaving two bullets in situ, although exceedingly unusual, have been documented [45]. There are case reports in which the bullets and exits through same wound after it ricochets in calvarium[46].



Fig. 1 entry wound

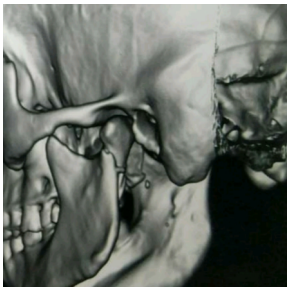


Fig.2 CT face showing mandibular fracture



Fig. 3 CT showing metallic foreign body in ascending colon

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