International Surgery Journal
Rani APR et al. Int Surg J. 2019 Nov;6(11):4117-4120
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20194635

Case Report

Laparoscopic extirpation of an intra-abdominal compressed air firearm pellet in a grownup: a rare case report

Arun Prasanth Raveendran Rani[1]*, Prathapan V. Nayar[2], Bichu Xavier[3], Balaji Manohar[4]

[1]Consultant General Surgeon, [2]Consultant Emergency Physician, [3]Consultant Radiologist, [4]Consultant Anaesthesiologist, PRS Hospital, Trivandrum, Kerala, India

Received: 22 September 2019
Accepted: 19 September 2019

***Correspondence:**
Dr. Arun Prasanth R. R.,
E-mail: arunprasanth1991@gmail.com

ABSTRACT

With expanded automation of life, abdomino-thoracic wounds have progressively gone in a new direction. Penetrating wounds would now be able to be brought about by inadvertent impaction of directed items joined toward machines or different structures. Emergency health care professionals frequently belittle the potential for pellet and ball bearing firearms to incur dangerous penetrating wounds. Here we will talk about a 37 year elderly person arrived in emergency division with grievances of unintentional pellet (air gun) damage to the abdomen. He then underwent extirpation of compressed air firearm pellet laparoscopically around the same time and sent home on the third day after complete recuperation. We further examine about the compressed air firearm related wounds.

Keywords: Air gun injury, Penetrating wounds, Laparoscopic foreign body removal, Pellet gun injury

INTRODUCTION

A pellet is a non-circular projectile intended to be shot from a compressed air firearm, and a firearm that shoots such pellets is regularly known as a pellet gun. Compressed air firearm pellets vary from bullets and shots utilized in guns as far as the pressures experienced: air firearms work at pressures as low as 50 atmospheres.[1] Gun wounds cause significant damage during warfare. It is along these lines seen that the method of encountering abdominal and thoracic wounds have experienced a change through the span of history. One can presumably finish the sum, if harm and organ included the greater part of the occasions by physical assessment, which is absurd if there, should arise an occurrence of shot damage. The wounds brought about by these shots rely upon their physical cosmetics, the speed, the range and the distinctive of their flight and nature of the tissue affected. As the shot infiltrates the body, the exchange of the vitality extends the tissues and powers them off the beaten path, making an impermanent cavity, which at that point crumples on itself. The tissues uprooted to shape a hole might be devitalized and may require broad debridement.[2]

This was the first case to be reported in India about laparoscopic retrieval of an intra-abdominal compressed air firearm pellet.

CASE REPORT

A 37 year elderly person, exhibited to the emergency division with a wound in abdomen after an inadvertent compressed air firearm pellet damage. He unintentionally fired himself while cleaning the airgun. He gave gentle uneasiness around the entry site of the pellet in his left hypochondrium. However he was mobilizing serenely. Assessment uncovered a soft abdomen with superficial tenderness at the pellet entry site. The pellet was not tangible in the parietal wall of abdomen. There was no proof of an exit site of wound. Blood investigations were all inside ordinary range.

Investigations

An anteroposterior view plain-film abdominal radiograph demonstrated the position of the foreign body (Figure 1) and also plain computed tomography (CT) study of abdomen shows the exact location of foreign body, which is in left upper abdomen, posterior to splenic flexure of colon and anterior to stomach without piercing it (Figure 2).

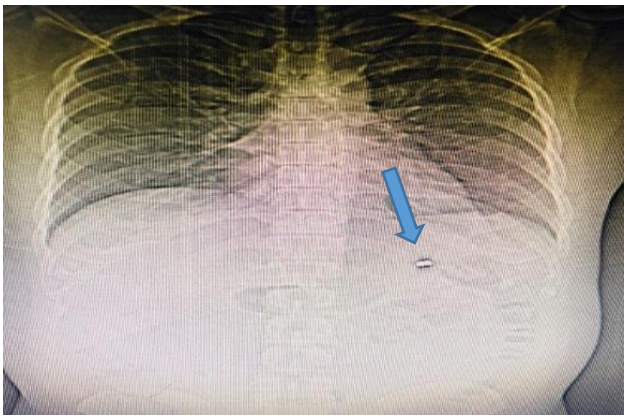

Figure 1: An anteroposterior view plain-film abdominal radiograph demonstrated the position of the foreign body (large hollow blue arrow).

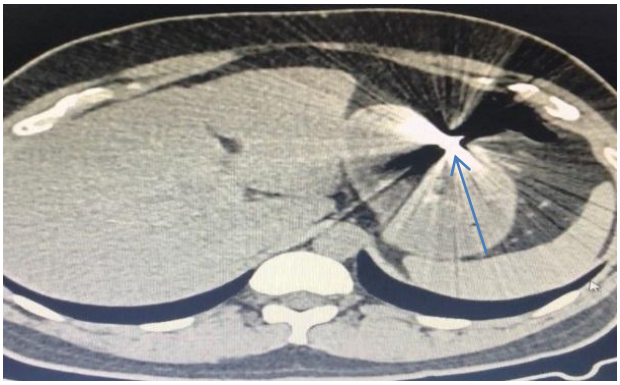

Figure 2: Plaint CT study shows the exact location of foreign body, which is in left upper abdomen, posterior to splenic flexure of colon and anterior to stomach without piercing it (small blue arrow).

Treatment

Under general anaesthesia, entry site of the pellet wound was examined and washed thoroughly. There was no proof of the pellet stopped in front of parietal wall or subcutaneous layers. Laparoscopy was at first embraced to check the uprightness of the peritoneum, and a pneumoperitoneum was made utilizing a Hassan chop down strategy at the umbilicus with a 10 mm port. Two further 5 mm ports were set in the Left iliac fossa and left lumbar area. A small defect was noted in the parietal peritoneum at the left hypochondrium. The gut was analysed deliberately along its length, uncovering the pellet embedded in the visceral peritoneum of the greater curvature of the stomach (Figure 3). Bowel was completely unblemished. The pellet (Figure 4) was extirpated utilizing laparoscopic spoon forceps by means of the 10 mm port. Employable time was 45 min. Post operation period was uneventful.

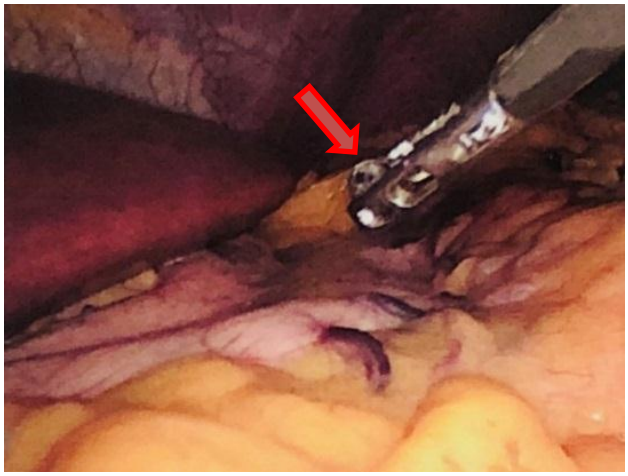

Figure 3: Laparoscopic picture showing air gun pellet near the greater curvature of stomach (large hollow red arrow).

Figure 4: Extirpated air gun pellet from abdomen.

Outcome and follow up

Patient recovered completely on the 3rd day and discharged without any complications.

DISCUSSION

A compressed air firearm (or airgun) is any sort of weapon that dispatches shots pneumatically with compacted air or different gases that are pressurized precisely without including any concoction responses, as opposed to a gun, which pressurizes gases synthetically by means of an exothermic oxidation (deflagration) of ignitable charges, which creates propulsive vitality by breaking sub-atomic bonds. Both the long weapon and handgun structures (air rifle and air gun) typically propel

metallic shots, that are either diabolo-shaped pellets or circular shots called BBs. Particular kinds of compressed air firearms (generally rifles) may likewise impel darts or bolts. The first compressed air firearms were created as right on time as the 1500s. They have been utilized in chasing, brandishing and fighting. Present day compressed air firearms utilize one of three kinds of intensity source contingent upon the plan: spring-cylinder, pneumatic, and packaged compacted gas (most commonly carbon dioxide).[3]

In India the utilization of weapons are managed by the Indian Arm Act, 1959 that proposed to amend and according to the proposal a new draft has been made on 2015. According to the new Arm Regulation Draft, 2015, securing of airguns with gag vitality under 20 Jules/15 feet or 0.177 mm will not require an arm permit. In any case, any compressed air firearm having gag vitality in overabundance of 20 joules would be dealt like guns. To utilize an airgun without a permit, it must pass the "Deal wood test".[4]

Various compressed air firearm related fatalities have happened with damage to the head, face and neck.[5-7] There have additionally been recorded lethal wounds to the thorax and major vessels, including an instance of suicide, wherein an air rifle pellet entered the right ventricle.[8] Intra-abdominal damage has likewise been accounted for in the writing and has been overseen both operatively and non-operatively. A case series report mentioned five kids with enteric perforation required laparotomy because of the accidental injury by air gun pellet.[9] Likewise, another case series reports four kids who underwent laparotomy, in which three kids had enteric perforation and further one kid had liver laceration and gallbladder perforation.[10]

A writing review recognized an aggregate of 16 instances of compressed air firearm related abdominal wounds in children.[10] Fifteen of the youngsters had plain stomach radiograph films, and the shot was distinguished as intraperitoneal in 14 of the cases; one film was uncertain. The 15 youngsters experienced exploratory laparotomies, incorporating the kid with uncertain radiograph discoveries. In that specific case, the entry was not investigated and on exploratory laparotomy, the pellet was seen as extraperitoneally. Thirteen youngsters had at least one or more bowel injuries. Interestingly, a hefty grown-up man with uncomplicated colonic damage was treated conservatively, and the pellet unexpectantly passed per rectum 12 hour after injury.[11]

Only two other case of laparoscopic removal of an air gun pellet has been previously reported globally. In the primary case, CT study shows pellet near the inferior vena cava in retro peritoneum and in the subsequent case, AP view and lateral view of X-ray demonstrates the pellet is 7cm deep to anterior abdominal wall. Using three port laparoscopic approach, pellet was retrieved in both cases. Both patients had an uneventful recovery during their postoperative period.[12,13]

CONCLUSION

Indian law doesn't require a permit to possess a compressed air firearm which has been related with extensive morbidity and mortality. Plain radiograph and CT study will reveal the position of the pellet, whether it is located intraperitoneally or extraperitoneally and about injury to the solid organs. Prior to any exploration procedure, entry site of the wound should be thoroughly examined. In a case of accidental air gun pellet injury, if the patient is stable, laparoscopic approach should be the first line management to reduce associated morbidity of laparotomy.

ACKNOWLEDGEMENTS

In a deeply appreciated manner, the authors acknowledge their thanks to the entire Emergency and Operation theatre staff of PRS Hospital, Trivandrum, for their selfless help.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Jim H. Hunting with airguns, Chapter 6. Available at: crosman.com. Crosman. Accessed on 10 December 2014.
2. Dodia H, Sansiya K. A study of penetrating thoracic and abdominal injuries. IOSR J Med Dent Sci. 2015;14(8):64-95.
3. Philip S. The Airgun of Meriwether Lewis, 2011. American Rifleman. Accessed on 23 December 2013.
4. Furtado R. Legal and illegal use of pellet guns In India. Available at: https://blog.ipleaders.in/legal-illegal-use-pellet-guns-india/. Accessed on 10 September 2016.
5. Bruce-Chwatt RM. Air gun wounding and current UK laws controlling air weapons. J Forensic Leg Med. 2010;17:123-6.
6. Radojevic N, Cukic D, Curovic I. Fatal laryngeal oedema in an adult from an air rifle injury, and related ballistics. Med Sci Law. 2015;55:54-7.
7. O'Neill PJ, Lumpkin MF, Clapp B. Significant pediatric morbidity and mortality from intracranial ballistic injuries caused by nonpowder gunshot wounds. A case series. Pediatr Neurosurg. 2009;45:205-9.
8. Bakovic M, Petrovecki V, Strinovic D. Shot through the heart–firepower and potential lethality of air weapons. J Forensic Sci. 2014;59:1658-61.
9. Bond SJ, Schnier GC, Miller FB. Air-powered guns: too much firepower to be a toy. J Trauma. 1996;41:674-8.

10. DiGuilio GA, Kulick RM, Garcia VF. Penetrating abdominal air gun injuries: pitfalls in recognition and management. Ann Emerg Med. 1995;26:224-8.
11. Oshodi TO, Bowrey D. Uncomplicated penetrating colonic injury. J Accid Emerg Med. 1996;13:296-7.
12. Muranyi M, Jozsa T, Benjo M. Laparoscopic removal of a paracaval air gun bullet in a child. Urol Int. 2012;89:246-8.
13. Oliphant Z, Tudor E, Bamford R, Mahon D. Laparoscopic retrieval of an intra-abdominal air gun pellet. BMJ Case Rep. 2015;2015:bcr2014208552.

Cite this article as: Rani APR, Nayar PV, Xavier B, Manohar B. Laparoscopic extirpation of an intra-abdominal compressed air firearm pellet in a grownup: a rare case report. Int Surg J 2019;6:4117-20.