SUNTEXT REVIEWS

SunText Review of Medical & Clinical Research
ISSN: 2766-4813

Open Access
Case Report
Volume 4:1

Abdominal Trauma by Firearm in a Malnourished Patient: Clinical Case

Castro-Vargas JM[1], Ramirez-Franco CA[1], Ramos-Jimenez LA[1], Baltazar-Herrera E[1], Castro-Vargas JM[1], Pinzon-Oregon O[1], Yepez-Vallejo S[2], Arredondo GP[2,*] and Fernandez FE[2]

[1]*General Surgery Residents, General Surgery Service of the General Hospital of Playa Del Carmen, Mexico*
[2]*General Surgeons, General Surgery Service of the General Hospital of Playa Del Carmen, Mexico*

[*]**Corresponding author:** Arredondo GP, General Surgery Service of the General Hospital of Playa Del Carmen, Av. Constituyentes, Ejidal Suburb, Solidaridad, Playa Del Carmen, Q. Roo, México; Tel: +52-984-876-2267; E-mail: gpadronarredondo@hotmail.com

Received date: 17 December 2022; **Accepted date:** 25 December 2022; **Published date:** 01 January 2023

Citation: Castro-Vargas JM, Ramirez-Franco CA, Ramos-Jimenez LA, Baltazar-Herrera E, Castro-Vargas JM, Pinzon-Oregon O, et al. (2023). Abdominal Trauma by Firearm in a Malnourished Patient: Clinical Case. SunText Rev Med Clin Res 4(1): 169.

DOI: https://doi.org/10.51737/2766-4813.2023.069

Abstract

Introduction: The use of firearms is a common cause of traumatic injuries, and an average of 120,232 firearm injuries are estimated to have occurred annually between 2009 and 2017. Despite the prevalence of firearm injuries, treatment decisions are still largely based on beliefs.

Clinical case: A 30-year-old male presented with penetrating abdominal trauma from a firearm projectile at the left flank, subcostal level in the mid-axillary line without active bleeding (entrance orifice). Exploratory laparotomy is performed. Intraoperative findings: multiple lesions of the small intestine. He also presented large intestine lesions, three of the transverse colon from the middle third to the splenic angle. Resection of that area was performed with distal closure in two planes and exteriorization of the transverse colon the ostomy was matured. During her postoperative period, she required parenteral nutrition. He was discharged with an ostomy, and after one year in colostomy status, bowel restitution was performed. Post-surgical stay with five days of fasting without complications and data of anastomosis dehiscence.

Discussion: Regardless of prevalence, malnutrition negatively affects clinical outcomes and increases hospital costs in addition to other factors. Patients are regularly admitted malnourished, and pre-admission factors associated with this may be underlying diseases, aging, and adverse socioeconomic conditions.

Conclusions: Penetrating abdominal wounds by firearms involve several organs, mainly hollow organs, and their treatment will depend on different variables inherent to the case.

Keywords: *Abdominal gunshot wound; Penetrating injury; Surgery; Trauma; Malnutrition*

Introduction

The use of firearms is a common cause of traumatic injuries, and an average of 120,232 firearm injuries are estimated to have occurred annually between 2009 and 2017. Despite the prevalence of firearm injuries, especially in centers in high-volume trauma, treatment decisions are still largely based on anecdotal beliefs. A common myth is that the heat produced by the ignition of the powder during the discharge of the firearm is sufficient to sterilize the bullet. Wolf et al refuted this idea by coating the bullets with a small amount of S. aureus, shooting into sterile ballistic blocks, and culturing the same from the bullet tracts. A penetrating injury creates an open pathway of entry into which projectiles and their components can carry bacteria and debris from the skin, clothing, environment, or other intermediate targets directly into a wound. Despite evolving understanding regarding possible infection, historical misconceptions likely played a role in the lack of lucid consensus on the use of

antibiotics in gunshot wounds [1,2]. In patients with penetrating injuries, it is important to assess their nutritional status to support them in their post-surgical recovery in the shortest possible time, and the diagnosis of malnutrition should be based on a low BMI (<18.5 kg/m^2) or on the combined finding of weight loss together with a low (age-specific) BMI or low FFMI using sex-specific cutoffs [3].

Clinical Case

A 30-year-old male patient presented with penetrating abdominal trauma from a firearm projectile at the left flank, subcostal level in the mid-axillary line without active bleeding (entrance orifice). At the level of the right hypochondrium, he presented rounded ecchymosis. He was consulted by the surgery department requesting surgical time to perform the exploratory laparotomy. Intraoperative findings: double lesion 1 cm approximately in the greater curvature of the stomach, multiple small intestine lesions at 15 cm the angle of Treitz grade III; to 20 cm grade IV; at 35 and 45 cm degree V; grade II a lesion 50 cm, for which resection of injured tissues and primary anastomosis, are performed in two planes. He also presented large intestine lesions, three of the transverse colon from the middle third to the splenic angle. Resection of this area was performed with distal closure in two planes, and exteriorization of the transverse colon towards the right flank the ostomy was matured. During her postoperative period, she required parenteral nutrition after evaluation by the hospital nutrition service indicating 2131 kcal/day and continuing with nutritional support at 79% with 1700 kcal in 2430 ml with osmolality of 830 mOsm through a central catheter. He was discharged with an ostomy, and after one year in colostomy status, he was scheduled for bowel restitution. The stoma was disassembled with the usual technique, the distal end was identified at the level of the descending colon, it was dissected and a manual end-to-end anastomosis was performed in two planes, and patency was identified. Post-surgical stay with five days of fasting without complications and data of anastomosis dehiscence (Figures 1 and 2). Your discharge at home is decided.

Discussion

The prevalence of hospital malnutrition varies between 15 and 70% depending on the type of institution and nutritional measurements. Regardless of prevalence, malnutrition negatively affects clinical outcomes and increases hospital costs regardless of other factors. Patients are frequently admitted malnourished, and factors before admission associated with this may be underlying diseases, aging, and socioeconomic situations [4]. Hospital malnutrition results in the deterioration of multiple systems. This cumulative nutritional deficit is often underestimated as its initial symptoms. Malnutrition manifests clinically as anorexia, dysphagia, and an inability to digest and absorb nutrients.

Figure 1: *Colon by enema prior to colostomy closure where a 17x8 mm metallic artifact (projectile) is observed.*

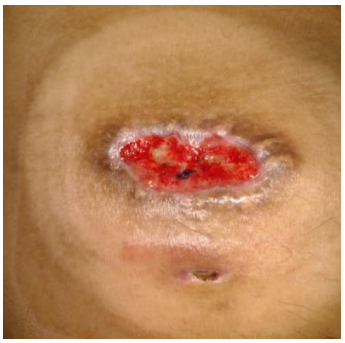

Figure 2: *Abdominal wall healing after ostomy closure.*

Nutritional deficiency is related to the loss of nutrients, increased nutritional requirements, and lack of consumption to meet these requirements, due to medications, prescription of restrictive diets, prolonged fasting, inability to eat without help, and disorganization of hospital nutrition services [5]. A study conducted found that there has been a marked resurgence in firearm injury submissions to the emergency department in 2016, in line with the Metropolitan Police firearms crime statistics [6]. The victims are young. Gunshot injuries place a burden on hospital resources and often require the expertise of multiple surgical specialties or a designated trauma surgeon with extensive capabilities. The introduction of the acute surgery and trauma department and the implementation of the major trauma network in 2010 have improved the management and outcomes of gunshot injuries at the South-East London trauma center. On the other hand, report in their study that abdominal trauma predominantly affects men and economically productive age [7]. Traffic accidents, stab wounds, and firearms were the main causes of abdominal injuries, which are why research studies are required on the correct use of weapons and sharp objects, as well as public awareness of traffic prevention. Accidents. In Germany, gunshot and stab wounds have a low incidence, and are mostly caused by violent crimes or suicide attempts. However, they account for more than half of all penetrating injuries. Depending on the

affected region, they are associated with a high mortality rate. The injuries often lead to considerable blood loss requiring early transfusion. Injuries to the chest or abdomen are two-chamber injuries. Due to the low incidence of these types of injuries, more data must be collected, and analyzed to assess and improve the quality of long-term care for patients with gunshot and stab wounds, special attention should be paid to focus on treatments that provide a survival advantage [8]. Reports that penetrating trauma is more common than blunt trauma and that the intestines are the most affected by penetrating and blunt trauma. For blunt trauma, the liver is most affected, followed by the spleen. The liver, as the largest organ, is prone to injury [9]. Abdominopelvic trauma is usually due to cavity violation from a gunshot or stab wound and is the leading cause of morbidity and mortality from traumatic injuries. Penetrating trauma can have subtle or complex imaging findings, posing a diagnostic challenge for radiologists. Contrast-enhanced CT is the choice to evaluate penetrating injuries, with good sensitivity and specificity for solid and hollow organs [10]. It would appear that stab wounds to the colon and gunshot wounds to the colon are different in terms of the severity of the injury and terms of outcome. This means that while the primary repair is almost always in stab wounds to the colon, the same cannot be said for gunshot wounds to the same organ because in gunshot wounds dehiscence of anastomosis and have higher mortality [11]. When feasible, intestinal continuity should be preserved as often as possible in the management of intestinal trauma, regardless of the site of injury. Anastomoses and sutures are safe in most cases, with a 2% fistula rate. Stoma creation is a risk factor for postoperative morbidity, which must be weighed against the hypothetical risk of anastomotic leakage [12]. Report that in their experience more than 90% of all combined penetrating intestinal injuries can be managed through the primary or delayed anastomosis, even in the most severe cases that require the application of the principles of control of damage. By applying this strategy, the overall need for an ostomy (primary or delayed) could be reduced to less than 10%. Hollow visceral injuries account for a significant portion of injuries sustained during penetrating trauma [13]. Currently, isolated lesions of the small or large intestine are commonly treated through primary anastomosis in patients undergoing definitive laparotomy or delayed anastomosis in patients requiring damage control surgery. The traditional ostomy surgical dogma has proven unnecessary and, in many cases, increases morbidity. Selective non-operative management (SNOM) is a feasible management method in the treatment of abdominal gunshot wounds, especially in patients with solid organ injuries only. It is not possible to predict the success of SNOM in advance. The most sensitive point in adopting this approach is the selection of the appropriate patients. To decrease morbidity and mortality in SNOM, patient selection and management must be performed carefully. In the presence of alarming symptoms, laparotomy should always be considered. Decision-making about the selection of patients for selective non-surgical management is essential to guarantee favorable results. It is not possible to predict the success of selective non-surgical management in advance. Careful clinical examination and close monitoring of these patients are vital; however, emergency laparotomy should be performed in case of changes in vital signs and positive symptoms related to peritonitis [14].

Conclusions

Penetrating abdominal wounds by firearms generally involve several organs, mainly hollow organs, and their treatment will depend on different variables inherent to the caliber of the projectile, the region involved, the distance between the attacker and the victim, the age of the patient, their nutritional status. And if he presents a state of hypovolemic shock at the time of being treated, in such a way that each case is unique and its immediate surgical management will depend on the variables present.

Conflict of Interest

None

Financial Support

This work did not receive any funding.

References

1. Wolf AW, Benson DR, Shoji H, Hoeprich P, Gilmore A. Auto sterilization in low-velocity bullets. J Trauma. 1978; 18: 63.
2. Baum GR, Baum JT, Hayward D, MacKay BJ. Gunshot Wounds: Ballistics, Pathology, and Treatment Recommendations, with a Focus on Retained Bullets. Orthop Res Rev. 2022; 14: 293-317.
3. Cederholm T, Bosaeus I, Barazzoni R, Bauer J, Van Gossum A, Klek S, et al. Diagnostic criteria for malnutrition and An ESPEN Consensus Statement. Clin Nutr. 2015; 34: 335e340.
4. Allard JP, Keller H, Teterina A, Jeejeebhoy KN, Laporte M, Duerksen DR, et al. Factors associated with nutritional decline in hospitalized medical and surgical patients admitted for 7 days or more: a prospective cohort study. BJ Nutr. 2015; 114: 1612-1622.
5. Bucay AJ, Machiavelo MA, Altamirano KA, Alarcón A, Ripoll F, Tarlovsky VF. Hospital Malnutrition: Food Services need to be improved in México. Int J Clin Nutr. 2017; 5: 13-17.
6. Norton J, Whittaker G, Kennedy DS, Jenkins JM, Bew D. Shooting up? Analysis of 182 gunshot injuries presenting to a London major trauma center over a seven-year period. Ann R Coll Surg Engl. 2018; 100: 464-474.
7. Demeke Altaye K, Zewdie Tadesse A, Bekele Crutch M, Wagenew W. Assessment of Pattern of Abdominal Injury over a Two-Year Period at St Paul's Hospital Millennium Medical College and AaBET Hospital, Addis Ababa, Ethiopia: A Retrospective Study Hindawi Emerg Med Int. 2022.
8. Bieler D, Kollig E, Hackenberg L, Rathjen JH, Lefering R, Franke A, et al. penetrating injuries in Germany epidemiology,

management and outcome an analysis based on the Trauma Register DGU®. Scand J Trauma, Resuscit Emerg Med. 2021; 29: 80.

9. Naeem BK, Perveen S, Naeem N, Ahmed T, Khan I, Khan I, et al. Visceral Injuries in Patients with Blunt and Penetrating Abdominal Trauma Presenting to a Tertiary Care Facility in Karachi, Pakistan. Cureus. 2018; 10: e3604.
10. Naeem M, Hoegger MJ, Petraglia III FW, Ballard DH, Zulfiqar M, Patlas, MN, et al. CT of Penetrating Abdominopelvic Trauma. Radiographics. 2021; 41: 1064-1081.
11. Oosthuizen GV, Kong VY, Estherhuizen T, Bruce JL, Laing GL, Odendaal JJ, et al. The impact of mechanism on the management and outcome of penetrating colonic trauma. Ann R Coll Surg Engl. 2018; 100: 152-156.
12. Tantardini C, Godiris-Petit G, Noullet S, Raux M, Menegaux F, Chereau N. Management of the injured bowel: preserving bowel continuity as a gold standard. BMC Surg. 2021; 21: 339.
13. Ordoñez CA, Parra MW, Caicedo Y, Padilla N, Angamarca E, Serna JJ, et al. Damage control surgical management of combined small and large bowel injuries in penetrating trauma: Are ostomies still pertinent? Colomb Med (Cali). 2021; 52: e4114425.
14. İflazoğlu N, Üreyen O, Öner OZ, Meral UM, Yülüklü M. Non-operative management of abdominal gunshot injuries: Is it safe in all cases? Turk J Surg. 2018; 34: 38-42.