

Surgical Management of Gunshot Wound at Level-II Hospital in Central African Republic in 2019/2020

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Abstract

Background: Gunshot wounds (GSW) are common in Central African Republic (CAR). There are about eighteen rebel groups in Central Africa. Arms are available among the rebel groups and also the civilians. For the very simple region they open the fire against the opponent. The aim of this study is outcome of surgical management of gunshot wounds at Bangladeshi Level-II hospital in the CAR during our tenure.

Methods: This was a prospective study of 14 patients with gunshot wounds who were treated at level-II hospital, Kagabandoro, CAR from Dec 2019 to Nov 2020 for a period of 12 months. Wound debridement and removal of bullets were done in 8 (57.14%) cases, keep bullets in situ position in 2(14.29%) cases and surgical toileting followed by primary closure of wound were done in 3 (21.42%) cases and one female patient transferred to level-III hospital in Bangui.

Results: Out of 14 patients there were 13 male and 1 female patients. Mean age of the patients was 32.21 (18-55 years). High velocity injuries were common in 10 (71.43%). Injuries involved the limbs in 10 (71.43%), chest in 2 (14.29%), abdomen in 1 (7.14%) and external genitalia in 1(7.14%). Most of the patients 12 (85.71%) presented to the hospital within 12 hours of the injury. The average length of stay in the hospital was 14 days (Range 2- 60 days). Fractures of the long bone were in 5 (35.71%) cases. Open reduction and internal fixation was done in 3 (21.43%) cases. One female patient was transferred to level-III hospital in Bangui due to fracture neck of femur following gunshot injuries with 9 months of pregnancy. Mean follow-up was 5 months (Range 1-12 months). Post trauma pain developed in 3 (21.43%) cases, deformities of the extremities was found in 2 (14.29%) cases.

Conclusion: Outcome of surgical management of the gunshot wounds were depends on the nature of tissue injury and availability of the resources with promptness of intervention.

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Key words: Gunshot wound (GSW), High velocity injuries, rebel group, open reduction and internal fixation.

Introduction

The Central African Republic has a long history of political turbulence with a succession of weak governments attempting to assert their authority beyond the capital city Bangui.¹ Due to regional, political and ethno-religious conflicts and also availability of the firearm increasing the number of gunshot injuries. These firearms are either locally fabricated or imported from other countries.² Improving the survival rate of casualties from the battle field is a primary goal for all military doctors.³ The nature of injuries varies from burns due to gun powder to varying degrees of musculoskeletal and organ injuries. Numerous medical challenges exist in the remote and contested environment of the battlefield where the clinical evidence base

is sparse, particularly in the pre-hospital arena.^{4,5}

Bangladeshi level-II hospital in Kagabandoro, Central African Republic has started their activities since 2014 and still it

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is ongoing with the facing of so many surgical challenges for the unconventional war among the arm groups. Gunshot injuries can be fatal and may be associated with lifelong disability. Management will involve rapid assessment, timely resuscitation, adequate and efficient treatment of injuries and effective rehabilitation where appropriate.²

Material and Methods:

This prospective study was conducted on 14 patients with gunshot wound at level-II hospital in Kagabandoro, Central African Republic from Dec 2019 to Nov 2020. Patients with major vascular and severe head trauma associated with GSW were excluded from the study. Patient from 18 years and above were included. Mean age of the patient was 32.21. Amongst them youngest patient was 18 years while oldest was 55 years. 13 male and 1 female cases were treated. Male and female ratio 13:1. High velocity injuries were common in 10 (71.43%). Injuries involves the limbs in 10 (71.43%), Chest in 2 (14.29%), abdomen in 1(7.14%) case and external genitalia in 1(7.14%) case.

Initial management was done on the basis of Advanced Trauma Life Support (ATLS) protocol. Therapeutic antibiotics and tetanus prophylactic was given for all patients. After the secondary survey of the patients, information on bio data, source of injury, nature of injury, region of body involved, type of gun used, injury arrival time, pre-hospital care, identity of those who brought the patient to hospital, treatment given in the hospital like wound debridement and removal of bullet were done in 8 (57.14%), keep the bullet in situ in 2 (14.29%), surgical toileting followed by primary closure of wound were done in 3 (21.42%).



Fig-3: Per-op findings



Fig-4: Entry wound at left buttock



Fig-5: Exit wound



Fig-6: Per operative



Fig-1: Entry wound right back of thigh



Fig-2: Pre-op x-ray



Fig-7: During follow-up



Fig-8: Bullet kept in situ Lt axilla



Fig-9: Entry wound in chest wall

Fig-10: Bullet kept in mediastinum

Open reduction and internal fixation were done in 3 (21.42%), one patient with lacerated external genitalia injury was managed with wound debridement and reconstruction of genitalia, and one female patient was transferred to level-III hospital due to fracture neck of femur with 9 months pregnancy and outcome of treatment at the time of leaving the hospital were documented and analyzed.

Results

Total 14 patients were treated during our study period.

Table-I: Distribution of patients according to age group (n=14)

Age(years)	No.	%
18-20	1	7.14
20-30	3	21.42
30-40	6	42.86
40-50	3	21.42
50-55	1	7.14
Total	14	100

Table-I shows that the mean age of the patient was 32.21 years (range from 18 to 55 years).

Table-II: Distribution of patients according to sex (n=14)

Sex	No.	%
Male	13	92.86
Female	1	7.14
Total	14	100

Table-II shows 13 patients (92.86%) male and 1 patient (7.14%) was female.

Table-III: Distribution of patients according to mode of injury (n=14)

Mode of injury	No.	%
High velocity injury	10	71.43
Low velocity injury	4	28.57
Total	14	100

Table-III shows that mode of injury due to high velocity trauma 10 (71.43%) patients Low velocity trauma 4 (28.57%) patients.

Table-IV: Distribution of region of the body injured by firearms (n=14)

Region of the body	No.	%
Limbs	10	71.43
Chest	2	14.29
Abdomen	1	7.14
External genitalia	1	7.14
Total	14	100

Table-IV shows common site of the injuries were limbs 10 (71.43%) patients where as chest in 2 (14.29) patients, abdomen in 1 (7.14%) patient and external genitalia in 1(7.14%) patient.

Table-V: Complications

Complications	No.	%
Post trauma pain	3	21.42
Deformity of extremity	2	14.29

Table-V shows that post trauma pain developed in 3 (21.42%) patients and deformity of extremity in 2 (14.29%) patients.

Table-VI: Surgical outcome

Rating	No.	%
Discharge with full recovery	9	64.28
Post trauma pain	3	21.43
Deformity of extremity	2	14.29

Table-VI shows that full recovery in 9 (64.28%) patients, post trauma pain developed in 3 (21.42%) patients and deformity of extremity in 2 (14.29%) patients.

Discussion

Gunshot wounds are common in Central African Republic among the armed groups. Day by day increasing the number due to unrest political situation in CAR. It is more common in males as was noted in this study, this is in tandem with previous report by earlier researchers.⁶ Males are more common due to they are more adventurous, prone to taking risks and perhaps more aggressive in bullying or defence.^{6,7} About 71% of victims were less than 40 years old, and almost 93% were less than 50 years of age. Our finding is similar to that reported in Ibadan, Nigeria.⁸ This age groups represents the productive workforce in CAR, thus injuries from gunshot is expected to have some socioeconomic import on the victims, their relations and by extension the country. These costs are not just for treatment but also the man-hours lost during care or in event of death or permanent disability.^{9,10} Vulnerability of these age groups was also noted in the review autopsy reports from ballistic missiles by Seleye-Fubara *et al.*¹¹

In our study, use of high velocity guns were very common 71.43% in compared with low velocity guns that was 28.57%. Similar study done by A.C. Etonyeaku *et al.*² in Nigeria during 2007-2011.

Common cause of gunshot wounds due to political unrest, robbery. Accidental GSW also found during festivals and celebrations that was similar to that reported Ogunlusi *et al.*¹² In our study there was no case of gunshot injury from suicidal attempt as was case in the study by Balci Y *et al.*¹³

Limbs are the common involved site of GSW which is similar, study done by Obalum *et al.* in Lagos, Nigeria.¹⁴

Soft tissue injury without any bony, viscera or viscus injury was managed by wound debridement followed by primary closure, delayed primary closure or by secondary intension. Limb injuries with fracture had wound excision with stabilization of fracture fragment, while chest injuries had wound debridement and primary closure of wound with bullet kept in situ as the patient was stable and position of bullet in safe site. One abdominal GSW was managed by exploratory laparotomy with drainage of blood, closure of perforated gut, one patient with lacerated external genitalia injury was managed with wound debridement and reconstruction genitalia.

Our most of the patient presented to Level-II hospital as soon as possible after gunshot injury which had been noted in the previous publication.¹⁵⁻¹⁷ Most of the patients brought directly to the Level-II hospital by the PAK-BATT and PAK-Eng. Coy from the incidence within short possible period of time. That was the main cause of early hospital presentation of the patient after GSW.

In our study all the patients survived and were discharge with post trauma pain in 3 (21.42%) cases and limb deformity in 2 (14.29%) cases which is similar, study done by A.C. Etonyeaku *et al.* in Nigeria.² In our study treatment was depended base on the wound not the velocity or type of the gun. Early surgical intervention formed the determinants of favourable outcome in our study.

Conclusion

Management of gunshot wound depends upon the nature of injuries, damage of tissues not on the nature of the firearms used. Early definitive management will provide the excellent outcome. Large scale studies could be assessed for better reflection of the impact of GSW.

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