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Management of maxillofacial injury in a 12-year-old due to exploding firecracker - A case report

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Type of Publication: Case Report

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# Abstract

**Rationale:** Firework injury can be hazardous and lead to serious injury with long term defects. If such injury encompasses the maxillofacial region it can lead to serious incapacitation. Early and apt treatment of such injuries are important to limit degree of damage.

**Patient concerns:** A 12year old boy suffered Maxillofacial injury due to explosion of a firecracker while playing with it without any adult supervision.

**Diagnosis:** The patient had three shrapnel lodged in his soft tissues due to explosion of a firecracker.

**Treatment:** The projectiles were removed under local anesthesia and the entry wound as well as the projectile pathway were debrided and sutured.

**Outcome:** The healing of the wounds was uneventful. Patient had no further concerns on follow up visit. **Take away message:** Use of firecrackers by children should be strictly under adult supervision; though banning the use of firecrackers would be more prudent. Furthermore, other, safer means of celebration should be encouraged in lieu of fireworks.

**Keywords:** Trauma, Maxillofacial injury, Firecracker, Projectile

## Introduction

Firecracker injury in children can lead to extensive burn and damage to the body. The impact can result in a debilitated state for life. An enormous damage can occur when the oral and maxillofacial region is involved. With vital structures like eyes, nose, ears and oral cavity present in close vicinity, the extent of damage cannot be overemphasized. The annual incidence of firecracker related injuries in India is 7 in every 100,000 Dr. Surya Singh, et al. International Journal of Dental Science and Innovative Research (IJDSIR)

population.<sup>[1]</sup> This paper highlights a case where a 12year old boy reported with a complaint of injury to his face. Child had suffered trauma due to explosion of firecracker on lower jaw.

#### **Case report**

A 12-year-old male patient came to our hospital with complaint of trauma to his face. Patient was conscious and well oriented to time, place and person. He gave history of playing with firecrackers without any adult supervision. He had placed the firecracker into a hollow rubber tire tube which had air valves. These valves got projected towards his face when the cracker exploded inside the tube leading the shrapnel to enter his tissues in relation to mandible, at two distinct sites. Immediately following trauma, he was taken to a local hospital and was managed conservatively; along with that basic radiographs were taken. Later he was referred to our maxillofacial unit.

On examination, approximately 1 to 1.5 cm lacerated wound was present below right corner of mouth, another one of similar size near left corner of mouth; one more over the left upper eyelid region. The first two lacerations depicted suspected entry wound. On palpation, firm, smooth, round lump could be noted near right parasymphysis region and left body region with slight edema. Intraorally no laceration was seen. No disturbances to occlusion were noted. The child had no other systemic injuries.

#### **Radiographic Examination**

PA mandible and lateral cephalic view, taken at primary center depicted two radiopaque foreign bodies in right mandibular parasymphysis and left mandibular body region.

3D CT scan of face revealed, two radiopaque foreign bodies lodged in soft tissue drape near right mandibular

parasymphysis region and left mandibular body region. The maxillofacial bones were intact (Figure 1).

### Treatment

The child was operated under local anesthesia. All the residual explosive powder sticking on the skin was cleared using 0.9% Normal Saline followed by spirit. Betadine painting and draping was done. On right side submandibular incision was given. On blunt dissection one shrapnel was exposed and removed (Figure 2). Entry wound debridement was carried on same side. Curettage was done for entire tract of travel pathway of projectile from entry wound to incision site. Lastly, two-layer suture was taken. Similar incision and dissection were repeated on the left side. Two shrapnel were removed (Figure 3). Again, curettage was done for entire tract of travel pathway of projectile from entry wound to incision site and subcuticular suture was taken. Both entry wounds were sutured after refreshing the margins. Patient was kept on antibiotics and postoperative healing after a week was satisfactory with no complications.

#### Discussion

In India on occasions like festivals, social celebrations, weddings and sport events; firecrackers are an important part of celebrations. During these events or festivals, burn injuries are common. When children suffer from such accidents the challenges regarding treatment increase. The injury can lead to scars and distorted facial appearance hence having impact on child's physical and psychological growth.<sup>[2]</sup> We were presented with projectile injury due to firecracker in a child, which could be equally devastating.

Maxillofacial injuries in children always present a challenge in respect of their management.<sup>[3]</sup> These wounds exhibit, a multirange soft tissue trauma, from burns to foreign bodies, fractures and concomitant trauma. Stepwise management is mandatory in such

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cases. Thorough debridement to remove all residual explosive powder, foreign body and nonvital tissue is important, followed by immediate reconstructive procedures and adequate management of soft tissue.<sup>[3]</sup> According to literature, male pediatric patients are the most likely to suffer firework-related injury. Moore et al found the highest rates of injury in predominantly males ages 10 to 19 (7.28 per 100,000) and 0 to 9 (5.45 per 100,000), with head and neck trauma (42%) and shoulder and upper extremity trauma (39.1%) comprising the majority of injuries.<sup>[4]</sup>

Children aged <5 years were commonly injured by personal failure (delayed withdrawal from ignited firework) and device failure (early or late blast). The age group 5-14 years showed all types of misuse behavior, as well as personal failure (delayed withdrawal). Misuse behavior was rampant in the age group 5-24 years using flare/fountains and crackers (particularly string bombs).<sup>[5]</sup> Hence fireworks-related injuries are most common in boys and children more than 10 years of age.<sup>[6]</sup>

The word shrapnel is derived from the name of Major-General Henry Shrapnel, an English artillery officer, who developed a new type of artillery shell. The term originally referred only to the spherical shot or musket balls dispersed when a shrapnel shell bursts, and this is still the strict technical definition of the term. However, "shrapnel" is now commonly used to describe all types of high-velocity fragments thrown out from an explosion and does not differentiate among the processes that create them. When a fragment has low velocity or meets high resistance, it will stop in the body at some point of its trajectory.<sup>[7,8]</sup>

Such was the scenario in our patient. The projectile had low velocity. This is the possible reason that the shrapnel in our patient did not fracture the bones or exit the soft tissues.

Nevertheless, the use of fireworks by children has to be strictly monitored by an adult. The best advice would be to not use fireworks at all but that's not practical as using fireworks to celebrate has become an integral part of our culture.

#### Conclusion

Firework related injuries are mostly avoidable. Safe handling of fireworks with proper safety measures should be educated in schools and children should be prohibited from handling fireworks. Fireworks should be subject to strict standardization, and only standardized fireworks should be marketed. Strict enforcement of the existing laws is quite essential to avoid such fatal injury to children and young adults.

#### References

- Sethy A, Saha S, Hazra D, Abhilash KP. A retrospective study on clinical profile of patients with firecracker-related injury presenting to the emergency department of a tertiary care center in South India. Curr Med Issues 2020;18:1-6.
- Sanjeev Kumar Singh, Mohammad Muneeb Mubashir, Nagarajan Sirini, Khushboo Bhalla, Aditi Kapur. Firecracker Maxillofacial Injury in a 6-Year-Old Child- A Case Report.Journal of Clinical Pediatric Dentistry,2022,46(3):188-191 DOI:10.17796/1053-4625-46.3.3
- Yadav S, Rai S, Rattan V. Management of Maxillofacial Injury due to Firecracker in a Child. J Postgrad Med Edu Res 2014;48(2):98-99.
- Mehta NK, Cowan B, Hojjat H, Johnson J, Chung MT, Carron M. Sparking the Debate: Facial Injury Patterns from Fireworks. Facial Plast Surg. 2020 Oct;36(5):659-664. doi: 10.1055/s-0040-1714116. Epub 2020 Jul 27. PMID: 32717762.

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- Puri, Vinita et al. "Firework injuries: a ten-year study." Journal of plastic, reconstructive & aesthetic surgery : JPRAS vol. 62,9 (2009): 1103-11. doi:10.1016/j.bjps.2007.12.080
- Bagri N, Saha A, Chandelia S, Dubey NK, Bhatt A, Rai A, Bhattacharya S, Makhija LK. Fireworks injuries in children: A prospective study during the festival of lights. Emerg Med Australas. 2013 Oct;25(5):452-6. doi: 10.1111/1742-6723.12114. Epub 2013 Aug 12. PMID: 24099375.
- Brook OR, Eran A, Engel A. CT multiplanar reconstructions (MPR) for shrapnel injury trajectory. Emerg Radiol. 2012 Jan;19(1):43-51. doi: 10.1007/s10140-011-0988-x. Epub 2011 Oct 14. PMID: 21996752.
- Ebert LC, Franckenberg S, Sieberth T, Schweitzer W, Thali M, Ford J, Decker S. A review of visualization techniques of post-mortem computed tomography data for forensic death investigations. Int J Legal Med. 2021 Sep;135(5):1855-1867. doi: 10.1007/s00414-021-02581-4. Epub 2021 Apr 30. PMID: 33931808; PMCID: PMC8354982.

**Legend Figures** 



Figure 1: (a) PA mandible and lateral cephalic View radiographs (b) 3D CT scan showing radiopaque foreign bodies



Figure 2: Right side. (a) Entry wound (b) foreign body removed. (c) Sutures taken



Figure 3: Left side. (a) Entry wound (b) Incision made and foreign body seen after dissection. (c) foreign bodies removed. (d) Sutures taken.