

Dental Trauma following Animal Attack: A Case Report

MEETKUMAR DEDANIA¹, NIMISHA SHAH², SANKALP MAHAJAN³, RIDDI THAKKAR⁴

ABSTRACT

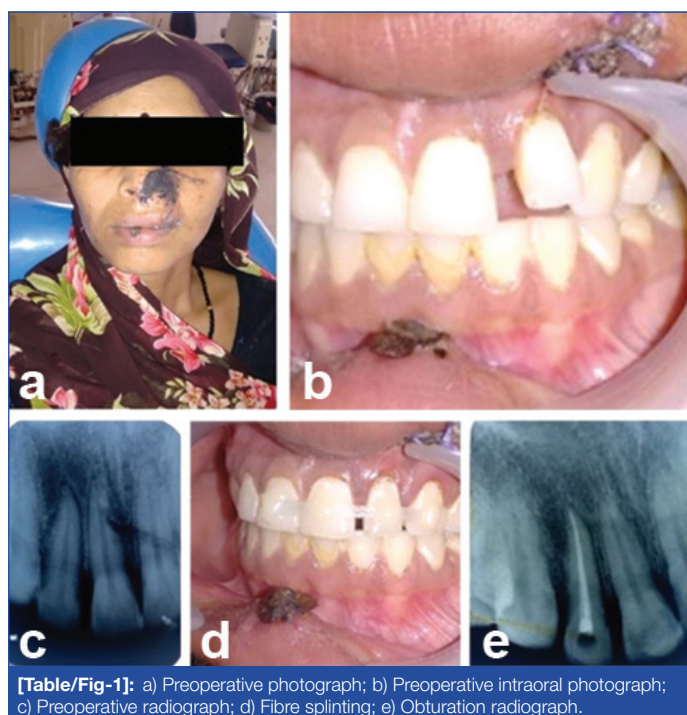
Animal attacks are a common cause of human injuries worldwide, with human-leopard encounters frequently reported in India. Animal attack injuries are increasingly common in trauma centres due to human encroachment into wildlife habitats, leading to more human-animal interactions. These attacks, especially to the face, can cause significant functional, cosmetic, and structural damage. A 40-year-old woman was attacked by a leopard, resulting in tooth mobility, pain, and orofacial lacerations. Initial treatment and primary wound closure were performed in Ratlam, Madhya Pradesh, India. On further examination, necrosis with blackish discolouration of the left ala of the nose was observed, along with scarring on the lips. Tooth 22 exhibited luxation without alveolar bone involvement, leading to proclination. A multidisciplinary treatment approach was adopted, beginning with manual manipulation and repositioning of tooth 22, followed by stabilisation and endodontic treatment. For extraoral management, plastic surgery was performed, involving a paramedian forehead flap and alar cartilage remodelling using left auricular cartilage. The patient underwent follow-ups at one, three, six months and one year. In conclusion, managing dental trauma from animal attacks requires a multidisciplinary approach and ongoing follow-up. By fostering collaboration among healthcare professionals and ensuring vigilant care, we can significantly improve patient outcomes and recovery.

Keywords: Flap, Luxation, Panthera, Splinting

CASE REPORT

A 40-year-old housewife reported to the department with a history of Leopard attack leading to tooth mobility and pain in upper left anterior tooth region. She was attacked by a leopard while working in the field one morning. The patient was unconscious for about three hours. Laceration of tissues was found in the orofacial region and nail marks on elbow of the right-side. Primary closure and preliminary treatment were done in a private hospital in Ratlam, Madhya Pradesh, India. Upon arrival, the patient's condition was addressed according to the ideal treatment protocol; however, there remains an opportunity for improvement to enhance care in the future. A delay of more than 6-12 hours increases the chances of infection, patient only reported to us after 20 days of the incident. On extraoral examination, necrosis of the flap with blackish discolouration of skin on left ala of nose involving nasal bridge [Table/Fig-1a] and lower third of nose along with facial asymmetry was noted. Overlying the necrosed skin, intact sutures were found with scar/laceration on the lips. According to classification of facial bite injuries by Lackmann [1], the diagnosis of IIA deep injury with muscle involvement was made. Luxation injury without involvement of alveolar bone resulted in proclination i.r.t 22 [Table/Fig-1b]. Tenderness on percussion was positive with a negative response on Electric Pulp Testing (EPT). Radiographic examination revealed, luxated tooth with radicular radiolucency surrounding the whole root i.r.t 22 with periodontal ligament space widening [Table/Fig-1c]. It was diagnosed as necrotic tooth i.r.t 22 with extrusive luxation (peripheral dislocation partial avulsion -N873.66). Partial displacement of the tooth out of its socket {Classification by Andreasen (1981)} [2].

Thus, considering the time elapsed since the incident and the severity, a multidisciplinary approach comprising of dental (Department of Conservative Dentistry and Endodontics) management and soft tissue (Department of Plastic surgery) management was planned. Firstly, manual manipulation and repositioning of the tooth was done followed by stabilisation with Fiber splint (Angelus Interlig Fiber Splint, Angelus, Brazil) [Table/Fig-1d] and flowable composite (Dtech Compo Flo, India). Occlusal adjustment was performed. For the necrosed tooth (22), Root canal treatment was



[Table/Fig-1]: a) Preoperative photograph; b) Preoperative intraoral photograph; c) Preoperative radiograph; d) Fibre splinting; e) Obturation radiograph.

initiated with access opening, Working Length (WL) determination (WL-19 mm) with electronic apex locator (Root ZX mini, Japan). Biomechanical preparation was done till Master Apical File (MAF)- 35 K and step back preparation till 60 K file. Interim calcium hydroxide dressing (RC Cal, Prime Dental, India) was changed thrice with an interval of 10 days each. Following this, the endodontic treatment was concluded with obturation with gutta percha (Dia-dent, South Korea) and resin sealer (AH Plus, Dentsply, USA) with lateral compaction technique [Table/Fig-1e] followed by a composite (Solare-X Nanohybrid Composite, GC South East Asia) post-endodontic restoration of 22. Spacing was present between 21 and 22, thus the space closure was planned with an aesthetic composite restoration [Table/Fig-2f] (Solare-X Nanohybrid Composite, GC South East Asia).

During the endodontic interappointment period, the extraoral management was implemented with a help of plastic surgeon. A paramedian forehead flap was performed to re-establish the defect. This flap was the usual interpolated flap taken from the face and it is very useful for reconstruction of the facial defect. Earlier, the flap that had been placed back in its original position had necrosed, so it had to be removed. Followed by this, the alar cartilage was remodelled with left auricular cartilage [Table/Fig-2g]. Following suturing, periodic aesthetic and endodontic check-up was done for one, six months [Table/Fig-2h] and one year [Table/Fig-2i,j]. Over the months, the aesthetics was found to be acceptable and suture marks disappeared. The endodontically treated tooth did not show any signs of infection, pus drainage, sinus tract or swelling.



[Table/Fig-2]: f) After space closure with composite restoration (intraoral clinical photograph); g- One month follow-up; h- Six months follow-up; i) One year follow-up; j) 1 year follow-up (Intraoral Clinical photograph).

DISCUSSION

Animal attacks are a major cause of orofacial trauma worldwide, including India. Human-leopard encounters often occur near dense forests, where medical facilities are inadequate. Severely injured patients may need to travel hundreds of kilometres for treatment. The clinical presentation and management of infected wounds depend on the lesion's location. These injuries are complex due to the unique polymicrobial inoculum involved, necessitating specialised care for infection management and functional restoration [3].

The cervicofacial region is the most affected area in animal attacks (36%), followed by the lower extremities (31%), upper extremities (19%), and chest (14%) [4]. Trauma to supporting tissues- such as extrusive, lateral, and intrusive luxation, as well as tooth avulsion- constitutes 15% to 61% of cases and is among the most severe injuries [5]. There are various case report and case series found which showed the maxillofacial injuries due to animal attack [4,5]. Notably, no cases of animal attacks with endodontic findings have been reported. Here, in this case endodontic finding as well as maxillofacial injury was also found in which, plastic surgery was required for aesthetic correction. This case report highlights a rare instance of a leopard attack resulting in traumatic dental injury and examines the treatment modalities employed.

Genus *Panthera* consists of five big cats and the leopard (*Panthera pardus*) is one of them. The leopard has muscular and short limbs and a broad head. The spots present all over the body are arranged in rosette pattern. Invasion of animal territory by humans has increased interaction between animals and humans, hence causing injuries to humans [3]. The final treatment depends upon the type and depth of the lesion, time elapsed since attack, site of the lesion and amount of tissue loss, if any [6]. Meticulous and

thorough cleaning of the lesion by irrigation of necrosed tissues and primary closure of the wound are the principle treatment options. Appropriate antibiotic therapy and tetanus and rabies immunisation are advocated wherever indicated for Post-Exposure Prophylaxis (PEP) [7,8].

Facial bite lesions typically have a lower infection rate due to the rich blood supply from facial arteries. In contrast, cat bites are more prone to contamination, as they harbour virulent organisms. Infection risk increases significantly if medical treatment is delayed beyond 6-12 hours, potentially affecting antibiotic efficacy. Animal bite infections are often multifactorial, with *Pasteurella multocida* being the most common. In large cat bite injuries, these Gram-negative coccobacilli are frequently isolated. Anaerobic species are also significant, found in 56%-70% of infected wounds. The recommended antimicrobial prophylaxis is a combination of amoxicillin and clavulanic acid, typically prescribed for 3-5 days, extending to 10-14 days in cases of cellulitis [8]. In this case, the initial treatment was inadequate, and the patient sought help 20 days later. A coordinated team of an endodontist, oral and maxillofacial surgeon, and plastic surgeon developed a comprehensive plan for endodontic intervention and aesthetic rehabilitation.

Pulp necrosis is mostly present in luxated teeth with closed apex and quite rare in open apex cases [9-11]. Two types of pulp necrosis are related to traumatic injuries: an ischemic sterile necrosis is caused by disruption of the blood supply at the apical foramen and infection-related liquefactive necrosis [9,10,12]. The reported prevalence of pulp necrosis in luxated teeth varies from 17 to 100% in accordance with severity of trauma type [10,13]. The luxated tooth in this case was repositioned with finger pressure and stabilised with fibre splint [14]. Root canal treatment was performed using a standardised technique, followed by obturation with the cold lateral condensation method. Given the importance of aesthetics, the spacing was restored with composite resin. During the multiple endodontic visits, surgical treatment was also conducted. For reconstructing nasal defects, paramedian forehead flaps were utilised, particularly suitable for larger defects (greater than 2 cm in width) due to their superficial axial blood supply, which reduces the risk of flap necrosis [15-17]. The use of cartilage autografts was considered over alloplastic graft to avoid the most dreaded complication of infection and rejection. Thus, an auricular cartilage autograft was used to reconstruct the nasal cartilage [17]. Follow-up assessments were conducted for both the endodontic treatment and plastic surgery to evaluate healing and aesthetic outcomes. In this case report, a delayed traumatic injury was addressed, successfully restoring the patient's aesthetic and functional needs. After one year, the left lateral incisor was asymptomatic, showing no signs of resorption or infection on radiographs, and overall aesthetics were satisfactory.

CONCLUSION(S)

In conclusion, animal bites represent a significant healthcare challenge, contributing to a widespread incidence of maxillofacial trauma globally. The severity of these injuries is determined by various factors, including the animal's characteristics and the bite's anatomical location. Beyond the immediate physical and psychological impact, the risk of infection further complicates the recovery process. Socio-economic barriers and a lack of awareness can hinder timely treatment, leaving many individuals vulnerable to the long-term consequences of these injuries. Effective management requires a coordinated, multidisciplinary approach to address the complex nature of bite trauma, ensuring that patients receive comprehensive care from multiple specialties. Furthermore, the necessity of long-term follow-up cannot be overstated, as complications can emerge years after the initial injury. By enhancing public awareness and improving access to care, the individuals can be better protected from the devastating effects of animal bites and ensure a pathway to recovery that emphasises both immediate and ongoing health needs.

Declaration: This case was selected as the "Case of the Month" in 2020 by the Indian Association of Conservative Dentistry and Endodontics (IACDE) in recognition of its rarity and clinical significance.

REFERENCES

- [1] Chhabra S, Chhabra N, Gaba S. Maxillofacial injuries due to animal bites. *J Maxillofac Oral Surg.* 2015;14:142-53.
- [2] Sharma B, Kaushal A. An overview of classification of traumatic injuries to tooth and its supporting structure. *Glob J Res Anal.* 2020;9(6):212-14.
- [3] Raut P, Pawar S, Kshirsagar R, Patankar A. Maxillofacial injury from a leopard attack. *Natl J Maxillofac Surg.* 2018;9(1):96-99.
- [4] Vijapur M, Ram B, Chalathadka M, Naganagoudar A, Ulasandra S, Parthasarathy P. Maxillofacial injuries due to animal attacks: A case series. *Oral Surgery.* 2022;15(4):630-36.
- [5] Mazumdar D, Roy P, Kumar P. Management of intrusive luxation with immediate surgical repositioning. *J Conserv Dent.* 2009;12:69-72.
- [6] Ram R. Maxillofacial injuries due to bear mauling. *J Maxillofac Oral Surg.* 2011;10:85-89.
- [7] Natarajan S, Galinde JS, Asnani U, Sidana S, Ramaswami R. Facial dog bite injury. *J Contemp Dent.* 2012;2:34-38.
- [8] Stefanopoulos PK, Tarantzopoulou AD. Facial bite wounds: Management update. *Int J Oral Maxillofac Surg.* 2005;34:464-72.
- [9] Lee R, Barrett EJ, Kenny DJ. Clinical outcomes for permanent incisor luxations in a pediatric population. II. Extrusions. *Dent Traumatol.* 2003;19:274-79.
- [10] Nikoui M, Kenny DJ, Barrett EJ. Clinical outcomes for permanent incisor luxations in a pediatric population. III. Lateral luxations. *Dent Traumatol.* 2003;19:280-85.
- [11] Ferrazzini Pozzi EC, von Arx T. Pulp and periodontal healing of laterally luxated permanent teeth: Results after 4 years. *Dent Traumatol.* 2008;24:658-62.
- [12] Love RM. Effects of dental trauma on the pulp. *Pract Periodontics Aesthet Dent.* 1997;9:427-36.
- [13] Humphrey JM, Kenny DJ, Barrett EJ. Clinical outcomes for permanent incisor luxations in a pediatric population. I Intrusions. *Dent Traumatol.* 2003;19:266-73.
- [14] Sule K, Malik A, Kothari A, Rao V. Management of luxation injuries in line with International Association of Dental Traumatology guidelines- Two case reports. *J Conserv Dent Endod.* 2024;27(5):561-63.
- [15] Mattox AR, McGuinness A, Ambrecht E, Maher IA. Comparison of ipsilateral and contralateral paramedian forehead flaps to reconstruct lateral nasal subunits. *Dermatol Surg.* 2018;44(12):1639-41.
- [16] Ni HC, Wang JC, Sun JM, Guo NQ. Expanded paramedian forehead flaps for nasal defects: Beyond aesthetic subunits. *Ann Plast Surg.* 2018;81(6S Suppl 1):S54-S58.
- [17] Padaki P, Wilson A, Johnston C. New technique to contour the paramedian forehead flap in nasal reconstruction. *Br J Oral Maxillofac Surg.* 2018;56(1):78-79.

PARTICULARS OF CONTRIBUTORS:

1. Reader, Department of Conservative Dentistry and Endodontics, K.M. Shah Dental College and Hospital, Sumandeep Vidyapeeth Deemed to be University, Vadodara, Gujarat, India.
2. Professor and Head, Department of Conservative Dentistry and Endodontics, K.M. Shah Dental College and Hospital, Sumandeep Vidyapeeth Deemed to be University, Vadodara, Gujarat, India.
3. Senior Lecturer, Department of Conservative Dentistry and Endodontics, K.M. Shah Dental College and Hospital, Sumandeep Vidyapeeth Deemed to be University, Vadodara, Gujarat, India.
4. Senior Lecturer, Department of Conservative Dentistry and Endodontics, K.M. Shah Dental College and Hospital, Sumandeep Vidyapeeth Deemed to be University, Vadodara, Gujarat, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Meetkumar Dedania,
Reader, Department of Conservative Dentistry and Endodontics, K.M. Shah Dental College and Hospital, Sumandeep Vidyapeeth Deemed to be University, Vadodara, Gujarat, India.
E-mail: meet97247da@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Oct 02, 2024
- Manual Googling: Nov 09, 2024
- iThenticate Software: Nov 16, 2024 (13%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Oct 01, 2024**

Date of Peer Review: **Oct 24, 2024**

Date of Acceptance: **Nov 19, 2024**

Date of Publishing: **Jan 01, 2025**