



ISSN: 2456-2912

VET 2024; 9(2): 320-322

© 2024 VET

www.veterinarypaper.com

Received: 03-12-2023

Accepted: 16-02-2024

Puli Vishnu Vardhan Reddy
Ph.D. Scholar, Department of
Veterinary Surgery and
Radiology, Madras Veterinary
College, Chennai, TANUVAS,
Tamil Nadu, India

Pushkin Raj
Department of Veterinary
Surgery and Radiology, Madras
Veterinary College, Chennai,
TANUVAS, Tamil Nadu, India

Shiju Simon
Department of Veterinary
Surgery and Radiology, Madras
Veterinary College, Chennai,
TANUVAS, Tamil Nadu, India

Sindhu Ramasamy
Department of Veterinary
Surgery and Radiology, Madras
Veterinary College, Chennai,
TANUVAS, Tamil Nadu, India

Saran S
Department of Veterinary
Surgery and Radiology, Madras
Veterinary College, Chennai,
TANUVAS, Tamil Nadu, India

Thenmozhi Ratnam
Department of Veterinary
Surgery and Radiology, Madras
Veterinary College, Chennai,
TANUVAS, Tamil Nadu, India

Corresponding Author:

Puli Vishnu Vardhan Reddy
Ph.D. Scholar, Department of
Veterinary Surgery and
Radiology, Madras Veterinary
College, Chennai, TANUVAS,
Tamil Nadu, India

Novel approach in treating calf's rostral mandible fracture using interfragmentary wiring: A case study

Puli Vishnu Vardhan Reddy, Pushkin Raj, Shiju Simon, Sindhu Ramasamy, Saran S and Thenmozhi Ratnam

Abstract

A 15-day-old female Jersey calf, weighing 15 kilograms, was presented to the outpatient unit of the Madras Veterinary College Teaching Hospital with the history of dog bite. Upon examination, hanging of the rostral mandible with instability at the diastema was observed. Radiographic assessment revealed bilateral oblique fractures caudal to incisors, which were stabilized using 20 G orthopaedic wire via interfragmentary wiring. The calf exhibited the ability to suckle from the first day postoperatively and recovered without any complications.

Keywords: Rostral mandible fracture, interfragmentary wiring, diastema, calf

Introduction

Mandibular fractures are rare in cattle, they may occasionally involve the rostral portion of one or both mandibles in calves (Ducharme, 2004) [2]. The most common fracture sites of the mandible in calves are typically found in the interdental space (diastema), followed by the molar region, and then the symphysis (Yu *et al.*, 2020) [10]. The conservative approach to managing mandibular fractures in calves often yields unfavorable outcomes, as the animals struggle to suckle, leading to rapid weight loss (Rasekh *et al.*, 2011) [6]. Fractures that occur bilaterally in the rostral aspect of the mandible within the interdental space frequently result in significant displacement, causing the jaw to droop and requiring surgical stabilization (Susan and norm, 2003) [8]. Various surgical methods have been documented for treating rostral mandibular fractures in horses and cattle. These include techniques such as lag screw compression, intramedullary nailing, wiring around the teeth (Ducharme, 2004) [2], and external fixation using devices like the Kirschner-Ehmer apparatus or a pinless fixator (Taguchi and Hyakutake, 2012) [9].

Case report

A 15-day-old female Jersey calf, weighing 15 kilograms, was brought to the outpatient unit of the Madras Veterinary College Teaching Hospital due to a dog bite incident, accompanied by bleeding from the oral cavity. Upon examination, there was noticeable hanging of the rostral aspect of the mandible with blood-stained saliva, along with significant swelling in the lower aspect of the jaw and below the tongue region (Fig: 1). Oral inspection revealed crepitus at the diastema of the mandible. Despite having vital parameters within normal limits, the calf appeared dull. Initially, stabilization was performed with intravenous administration of 200ml of Ringer's lactate, 200mg of Amoxicillin plus Cloxacillin, and 3.5mg of Meloxicam. Following stabilization, the calf underwent radiography, including lateral and dorsoventral views of the skull, revealing bilateral oblique fractures in the diastema (Fig: 2). To alleviate discomfort and pain from the hanging of the rostral aspect of the mandible, a temporary tape muzzle was applied on the first day of presentation. By the second day, the edema had significantly reduced. The calf was sedated using intramuscular injection of xylazine @ 0.1mg/kg. Additionally, a bilateral mental nerve block was administered using 2ml of 2% Lignocaine hydrochloride.

The fracture site was thoroughly rinsed with a 0.1% chlorhexidine solution, and the animal was placed in sternal recumbency. A 2mm drill bit was used to create a hole in the caudal fragment, and another hole was drilled caudal to the incisor teeth in rostral fragment. A 20-gauge orthopedic wire was then passed through these holes and secured ventrally in the form of interfragmentary wiring. The same procedure was repeated on the opposite side after ensuring proper apposition and rigid fixation of the fracture fragments (Fig: 3 and 4).



Fig 1: Pre-operative image showing hanging of rostral mandible



Fig 2: X-ray image showing bilateral oblique fracture caudal to incisors



Fig 3: Post-operative radiograph showing bilateral interfragmentary wiring



Fig 4: Post-operative showing proper occlusion of oral cavity

Post operatively, advised rinsing the oral cavity with diluted potassium permanaganate solution and Inj. Meloxicam 0.2 mg/kg i/m, Inj. Amoxicillin plus Cloxacilin 12 mg/kg for 5days. Calf started suckling milk from 2nd post operative day. Healing was noted by 4weeks period and the orthopaedic wire was removed in the 5th week.

Discussion

The tension side of a rostral mandibular fracture consistently lies on the oral surface of the mandible, causing the front part of the fracture to displace ventrally so fixation using interfragmentary wiring gives rigid fixation. The primary objective of surgical intervention for mandibular fractures is to achieve temporary stabilization of the primary fragments, enabling pain-free mastication and rumination until adequate callus formation occurs to stabilize the fracture. While previous reports have cited dystocia-induced traction (Mahla *et al.*, 2002) [5], falls or impacts on hard surfaces, and kicks by other animals (Gosai *et al.*, 2022) [3] as common causes of mandibular fractures in calves, this particular case involved a mandibular fracture resulting from a dog bite.

Various methods have been employed to stabilize mandibular fractures: Taguchi and Hyakutake (2012) [9] utilized external coaptation with fiberglass casting tape, (Lischer *et al.*, 1997) [4] applied a pinless external fixator in a cow, resulting in osteomyelitis and bone sequestration at the fracture site, while (Gosai *et al.*, 2022) [3] opted for bilateral intramedullary pinning, which could damage alveolar roots and medullary blood supply. (Mahla *et al.*, 2002) [5] reported cases of osteomyelitis and osteoporosis treated with K-wires, while (Aksoy *et al.*, 2009) [1] successfully treated mandibular fractures using transfixation pinning and fiberglass cast. Sooryadas (2009) [7] utilized a tape muzzle followed by esophagotomy tube feeding. However, in this particular case, interfragmentary wiring was chosen due to its ease of performance, providing adequate stabilization, enabling early jaw usage, and minimizing complications. Mandibular fractures frequently extend into the oral cavity, which can result in common complications including osteomyelitis, alveolar periostitis, and bone sequestration (Lischer *et al.*, 1997) [4].

Conclusion

Mandibular fractures in calves, although rare, pose significant challenges due to their impact on feeding and overall animal well-being. Conservative management often leads to unfavorable outcomes, necessitating surgical intervention for proper stabilization and healing. Our case report illustrates successful management of a rostral mandibular fracture in a

calf using interfragmentary wiring, resulting in rapid recovery and functional restoration. This approach provides rigid fixation, allows early jaw usage, and minimizes complications associated with other surgical techniques. While various methods exist for treating mandibular fractures, careful consideration of the fracture type, location, and potential complications is essential for determining the most suitable approach.

References

1. Aksoy O, Ozaydin I, Kilic E, Ozturk S, Gungor E, Kurt B, *et al.* Evaluation of fractures in calves due to forced extraction during dystocia: 27 cases (2003-2008). *Kafkas Univ Vet Fak Derg.* 2009;15:339-344.
2. Ducharme NG. Surgical diseases of the oral cavity. In: Fubini SL, Ducharme NG, editors. *Farm Animal Surgery.* Saunders; 2004. p. 161-175.
3. Gosai RK, Patel AN, Patel JB, Patel AM, Sutaria PT, Desai MJ. Surgical immobilization of bilateral mandibular fracture in calves. *Pharma Innovation J.* 2022;SP-11(11):1995-1997.
4. Lischer CJ, Fluri E, Auer JA. Stabilisation of a mandibular fracture in a cow by means of a pinless external fixator. *Vet Rec.* 1997;140:226-229.
5. Mahla JK, Amin NR, Dabhi PB, Mecvan AR, Parikh PV. Management of dystocia induced mandibular fracture in new born calves: A review of 14 cases. *Pharma Innovation J.* 2022;SP-11(11):1156-1157.
6. Rasekh M, Devaux D, Steiner A. Surgical fixation of a symphyseal fracture of the mandible in a cow using cerclage wire. *Vet Rec.* 2011;169:252.
7. Sooryadas S. Traction Induced Mandibular Fracture in a Neonatal Calf and its Management with Tape Muzzle Immobilization. *Intas Polivet.* 2009;10(II):238-239.
8. Susan F, Norm D. Surgical Diseases of the Oral Cavity. In: Fubini SL, Ducharme NG, editors. *Farm Animal Surgery.* St. Louis: Elsevier Saunders; 2004. p. 161-175, 313.
9. Taguchi K, Hyakutake K. External coaptation of rostral mandibular fractures in calves. *Vet Rec.* 2012;170(23):598.
10. Yu Y, Kim N, Heo S. Application of Plate and Circumferential Wiring with Resin to Bilateral Mandibular Fractures in a Calf: Case Report. *J Vet Clinics.* 2020;37:363-366.