Use of orthopedic metallic blocked plate for correction of unilateral jaw fracture in domestic dog: case report

Relato de caso: uso de placa metálica ortopédica bloqueada para correção de fratura unilateral de mandíbula em cão doméstico

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ABSTRACT
Mandible fractures are common in the routine of the clinical veterinary doctor of small animals, the treatment aims to immobilize the lesion to restore functional mobility of the bone as well as natural feeding and chewing. The determination of therapy is conditioned to some factors: type of fracture, location, presence of teeth, dental occlusion, race and age. There is no ideal technique of choice for all fractures, because each case has to be analyzed, taking into account the various factors, to use the most effective treatment for a given situation. New types of materials and digital technologies are current trends that will allow optimizing the treatment protocols of jaw fractures. There is no technique of choice, so the objective was to report a clinical surgical case of a dog, male 3 years old and with unilateral fracture of the horizontal branches of the right mandibular body. The methodology of choice for treatment was the use of blocked plaque and fixation by surgical osteosynthesis. After 90 days of clinical and surgical treatment, the animal was released from its treatment in perfect health.

Keywords: mandible fracture, orthopedics, osteosynthesis, veterinary traumatology.

RESUMO
As fraturas de mandíbula são comuns na rotina do médico veterinário clínico de pequenos animais, o tratamento visa imobilizar a lesão para restabelecer a mobilidade funcional do osso bem como a alimentação e mastigação natural. A determinação da terapêutica está condicionada a alguns fatores: tipo de fratura, localização, presença de dentes, oclusão dentária, raça e idade. Não há uma técnica de escolha ideal para todas fraturas, pois cada caso tem que ser analisado, levando em consideração os diversos fatores para utilizar o tratamento mais efetivo para determinada situação. Os novos tipos de materiais e tecnologias digitais são tendências atuais que permitirão otimizar os protocolos de tratamento de fraturas de mandíbula. Não há uma técnica de escolha, portanto, objetivou-se relatar um caso clínico cirúrgico de um cão, macho de 3 anos de idade e com fratura unilateral do ramo horizontal do corpo mandibular direito. A metodologia de escolha para o tratamento foi a utilização de placa bloqueada e fixação por osteossíntese cirúrgica. Após 90 dias de tratamento clínico e cirúrgico, o animal foi liberado de seu tratamento em perfeito estado de saúde.

Palavras-chave: fratura de mandíbula, ortopedia, osteossíntese, traumatologia veterinária.
1 INTRODUCTION

Mandibular fractures ordinarily result from direct trauma, occur within a fraction of a second and are unceasingly traumatic for the animal and its legal guardian. The mandible has the function of mastication, the first step in the process of food digestion, swallowing and maintenance of dental occlusion. Mandibular fractures can lead to facial deformities, such as bite changes or problems in the temporomandibular joint, due to displacement or bone loss. (UMPLET, 1990; MENDES et al., 2019).

In dogs, the mandibular body is the most affected, the small size of this region delimits which treatments must be offered in these lesions, with the objective of restoring the masticatory function with greater speed (PIGNONE & CORREA, 2007).

Clinically, mandibular fractures can be identified by palpation, imaging studies can complement the previous diagnosis. The patient is palpated under sedation, the fracture is identified, the area will present mobility, fragility and increased sensitivity. (JOHNSON, 2014). Traditional radiography, commonly used, is not the most effective method for diagnosis, as the overlapping of bones and tissues can obscure the detection of lesions, making it impossible to correctly visualize the fracture point (BAR-AM., 2008; HANSEN, 2008). This paper aims to report a clinical case of a patient taken with a unilateral fracture of the mandible associated with surgical treatment and the use of a locked orthopedic metal plate, not widely and commonly used in this orthopedic context.

2 CASE REPORT

An animal of the canine species, male, of no defined breed, 3 years old, weighing 10 Kg, presenting as main complaint, facial wounds (IMAGE 01), pain and a crooked mouth was treated at the Veterinary Hospital Fullpet Guarulhos/SP.

Image 01. Facial edema with small lesions along the face is noted. The animal was admitted to the hospital in the lateral position, poorly responsive to painful
stimuli, had hypothermia, absence of palmar reflex, deep and superficial pain reflex, nasal bleeding and horizontal nystagmus.

Immediate hospitalization was requested to stabilize the clinical picture, a radiographic study (IMAGE 02) of the skull was subsequently performed under chemical containment, to verify the type of injury or fracture, in order to complement the diagnosis.

Image 02 (A). Radiographic study of the skull in right lateral decubitus and lateral lateral projection shows discontinuity with the horizontal branch of the mandible, with evident loss of anatomical axis. (B) The patient's mandibular X-ray shows a complete simple transverse fracture of the middle third of the right mandibular body with significant deviation of the anatomical bone axis.

The therapeutic option for the stabilization of the animal focused on ringer lactate, metronidazole, dipyrrone, tramadol (2 mg/Kg), pethidine (2 mg/Kg), dexamethasone (0.5 mg/Kg), cyanocobalamin (0.5 mg/Kg) and phytomenadione (1.0 mg/Kg) and local cleansing with chlorhexidine gluconate-based mouthwash.

The radiographic study was carried out for a better evaluation, and a complete transverse simple fracture was found in the middle third of the body of the right mandible, with significant deviation of the anatomical bone axis. In view of the clinical and radiographic characteristics, the chosen treatment was surgical intervention under general anesthesia to reduce the fracture.

As pre-surgical medication, intramuscularly, acepromazine (0.05 mg/Kg) was used as a tranquilizer, as a means of promoting the desired relaxation, followed by subcutaneous atropine (0.04 mg/Kg), and as an analgesic tramadol chloride (4 mg/kg) was used intramuscularly. Anesthetic induction was performed with propofol (6 mg/Kg), and isoflurane used for the general anesthetic inhalation. To reduce the fracture, a surgical technique was used, and osteosynthesis was performed using screws and a metallic orthopedic plate with four stainless steel orthopedic screws, two caudal
screws and two rostral screws. The mandible treatment aims to establish dental occlusion and jaw’s function.

3 RESULTS

After treatment to minimize post-surgical pain, the animal was released from conservation treatment, pasty feeding Moon Petit Cherry, topical antibiotic treatment for surgical wound. After 30 days, a new radiographic study was carried out for postoperative follow-up (IMAGE 03). Over 90 days of treatment, the process of bone consolidation and total release of the animal was completed.

Image 03 (A). Presence of evident structure of characteristic radiopaque linear metal plate) parallel to the left mandibular horizontal branch. (B) It is noted the presence of four linear structures (screws), in transverse axis reaching two corticals of the horizontal branch of the mandible. Two rostrais and two flow rates are the fracture line. Fracture line is rounded in the process of consolidation.

4 CONCLUSION AND DISCUSSION

Mandibular fractures are a very common problem in veterinary practice, accounting for about 3% of all fractures in dogs (PIERMATTEI & FLO, 1997; BOFFANO et al., 2015; GADICHERLA et al., 2016). The cause of mandible fracture is more frequent in animals hit by motor vehicles, involvements in fights, kicks and falls, kicks are also common causes of jaw fractures (PEREIRA, 2008; PIMENTEL, 2021). The objective of fracture repair is to use rigid fixation to achieve functional reduction and fracture alignment to obtain bone consolidation of the entire fracture. Information including fracture location, number of fractures, direction of fracture line, affected teeth, oral lacerations, bone exposure, and the condition of surrounding oral tissues are important for planning fracture repair. In order to reduce the fracture, surgical technique was used, using stainless steel orthopedic screws and plates for osteosynthesis (SILVA et al., 2021).
According to Sauerbier et al. (2008), bone plates and screws are standard procedures in routine clinical practice. They also state that this system provides better handling, better stability and less bone pressure, in addition to easy adaptation and possibility of intraoral methods without exposing large bone extensions for surgical reduction.
REFERÊNCIAS


