MANDIBULAR FRACTURE AND ITS SURGICAL MANAGEMENT IN A DOG

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A 3 years old male Spitz dog weighing 8 kg body weight was presented at the Department of Veterinary Surgery and Radiology with complaint of hanging of anterior part of lower jaw after automobile accident. Examination confirmed complete and open left side mandible fracture. The fracture was corrected surgically using Steinman's pinning. Proper post-operative care was taken and clinical union was seen after 5th weeks. Then the pin was removed and the animal recovered successfully.
Keywords: Automobile accident, dog, mandibular fracture, Steinman's pinning.

Introduction

Fractures of the mandible are very common in dog and cat (Newton and Nunamaker, 1985) and fractures particularly in the premolar region are most common in the dog accounting with 31% of all types of mandibular fractures. Automobile trauma being the most common cause and most patients are young, having a mean age of 3 years (Umphlet and Johnson, 1990) and almost 50% of the affected dogs are less than one year of age (Goeggerle *et al.,* 1996). Mandibular fractures are usually bilateral; result from trauma, severe periodontitis or neoplasia (Fossum, 2002) and invariably involve the mandibular symphysis (Singh *et al.,* 1993). Oral trauma, dropped jaw, ptyalism, oedema and pain on palpation at mandible are the diagnostic clinical signs of the condition (Roux, 2007). The configuration of fracture and extent of damage to bony tissue can only be ruled out after radiographic examination (Dabas and Chaudhari, 2013). The healing of most mandibular fractures is rapid enough and generally heal without a large callus (Owen *et al.,* 2004). The present paper puts on record of a case of unilateral mandibular fracture in Spitz dog and its successful surgical management with Steinmann's pin.

Case history and Clinical Observations

A 3 years old male Spitz dog weighing 8 kg body weight was presented at the Department of Veterinary Surgery and Radiology, C.V.Sc. and AH, OUAT, Bhubaneswar with complaint of hanging of anterior part of lower jaw after automobile accident since 3 days (Fig.1). There was difficulty in taking both liquid and solid food and drooling of blood stained saliva and halitosis. Palpation of the area elicited pain and there was open and complete fracture of left mandible just before the canine teeth. The left side of lip was injured with development of maggoted wound. On clinical examination the temperature, heart rate and respiration were within normal range. Radiographic examination was done by C-arm which revealed single transverse fracture of left mandible without involving other part. Basing on case history, physical and radiographic examination the case was diagnosed as unilateral mandibular fracture and hence decided for surgical correction by intramedullary pinning.

Surgical procedure

On the day of presentation the wound was dressed properly with antiseptic and maggacide lotion along with parenteral antibiotics and anti-inflammatory agents. Oral cavity was cleaned with chlorhexidine solution mouth wash. It was followed for 3 consecutive days and at the time of wound healing it was planned for surgical

interference. Under fasting for 16 hours it was premedicated with atropine sulphate @ 0.04 mg/kg body weight intramuscularly before 20 minutes of operation. Then Xylazine @ 1 mg/kg intramuscularly and Ketamine @ 8 mg/kg body weight intravenously was administered. Fluid therapy was maintained with Ketamine in "top-up" form until the end of surgery. The mouth cavity was washed and cleaned properly with chlorhexidine solution. The fractured fragments of the mandible were immobilized using Steinman's pin of suitable size via normograde fashion by means of electrically operated orthopaedic drill. Drilling procedure was conducted under guidance of C-arm examination (Fig.2). The extra portion of the pin was cut by pin cutter. Post-operatively the dog was treated with inj. of Ceftriaxone @ 10 mg/kg body weight for 7 days and inj. Meloxicam @ 0.2 mg/kg bodyweight for 3 days. Inj. B-complex was administered for 3 days along with regular mouth wash was carried out with chlorhexidine. The owner was advised to provide only liquid food and to use muzzle regularly. After 5th week there was clinical bony union observed. So the pin was removed. The patient showed mild jaw movement which was gradually improved. There were no post operative complications marked and animal recovered well.

Fig.1. Mandibular fracture

Fig.2. C-arm examination after intramedullary pinning

Results and Discussion

Approximately, 1.5 to 2% of fractures in dogs involve mandible (Umphlet and Johnson, 1990 and Goeggerle *et al.,* 1996) and 70% of them are open fractures. Most jaw fractures are open with varying degrees of contamination and infection. The complications use to occur in jaw fractures is as high as 34% of cases. Nearly 2/3 of those complications involved dental malocclusion or osteomyelitis (Piermattei *et al.,* 2006). Fractures of Mandible that progresses to osteomyelitis, necrosis or nonunion may require a partial mandibulectomy. However, animal can function adequately with a fibrous union of the fracture fragments (Olmstead, 2010). In the present case it was not required to go for mandibulectomy as it was a clear positive fracture and the intramedullary pinning was able to correct the condition. In general healing is rapid in roastal mandible but more delayed in the caudal region (Gonul *et al.,* 2009). Many cases are functionally healed up within 2–3 weeks, with a reported average healing time between 5.5 and 6.3 weeks (Owen *et al.,* 2004). Here the fracture was rostral and required 5 weeks time period for complete healing.

The principle of immobilizing these fractures in young animals and potential complications arising from jaw

fracture needs attention. Fractures of body of mandible are readily handled by a number of methods including external skeletal fixation, plates and screws and also with intramedullary pins (Leach, 1974). Marshall *et al.* (2010) used circular external skeletal fixation for repair of bilateral mandibular fracture in a dog. Voss *et al.* (2009) used unilock mandible locking system. Mandibular fractures in dogs were immobilized by tape muzzles (Umphlet and Johnson, 1990), miniplate fixation (Boudrieau and Kudisch, 1996), circular external skeletal fixation (Marshall *et al.,* 2010). Snyder *et al.* (2009) used interfragmentary wire surgical technique to repair a caudal mandibular fracture in a 15 week old Labrador Retriever dog. Hoelzler and Holmberg (2001) reported that standard fixation technique like intramedullary pinning would not be the best method for mandibular fixation as the pins becomes loose post-operatively due to grasping of objects by the dog with an intolerable force. Here only intramedullary pinning was successful as there was single fracture and during post-operative period the owner was advised to be conscious in regular using muzzle, feeding liquid diet and to avoid manipulation by the patient. Fractures of horizontal ramus often next to the root of an adjacent tooth and care must be taken to ensure that there is enough bone on both sides of the fracture to allow bone-to-bone union. Bone will not heal to an adjacent tooth and non-union will result (Newton and Nunamaker, 1985). In the present case the fracture was away from canine teeth and there was sufficient bone adjacent to fracture line. Complications of gingivitis can be controlled by rinsing the mouth using chlorhexidine after meals (Niemiec, 2003). Here regular mouth wash with chlorhexidine solution was advised till healing of the fracture. During post-operative period by maintaining all these measures no complication was found and the dog recovered.

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