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กรณีศึกษา : การจัดการปัญหาตัวและรากฟันแตกแบบซับซ้อนในม้า

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บทคัดย่อ: โรคฟันในม้ามีหลายแบบที่สามารถพบเจอได้ตัวอย่างเช่น ปัญหาฟันแตก ซึ่งต้องการวิธีการตรวจรักษาที่ถูกต้องและอุปกรณ์ที่เหมาะสมเพื่อที่จะให้ผลลัพธ์ออกมาดีที่สุด จากการศึกษาม้าวอมบลัด (Warmblood) อายุ 16 ปี เพศผู้ตอน พบว่าม้ามีความอยากกินอาหารลดน้อยลงและมีพฤติกรรมในการขี่เปลี่ยนแปลงไป โดยการตรวจฟันจะใช้กล้องส่องตรวจในช่องปากและรังสีวินิจฉัย ร่วมกับการวางยาซึมแบบยืนโดยใช้ Detomidine hydrochloride และ Butorphanol tritate วินิจฉัยได้ว่าฟันกรามซี่ที่ 109 มีปัญหาตัวและรากฟันแตกแบบซับซ้อน (CCRF) การรักษาจะทำการถอนออกโดยใช้ Steinmann pin repulsion technique หลังถอนด้วยวิธีอื่นไม่สำเร็จ หลังจากถอนฟันไปแล้ว 1 เดือน ไม่พบว่าม้ามีปัญหาเรื่องโพรงไซนัสอักเสบ ซึ่งปกติแล้ว Steinmann pin repulsion technique จะเป็นทางเลือกสุดท้ายที่จะใช้ในการถอนฟันกรามในม้า เนื่องจากมีความเสี่ยงที่จะทำให้เกิดโพรงไซนัสอักเสบได้สูงหรือเกิดรากฟันค้างได้ นอกเหนือจากปกติในกรณีนี้ยังมีการให้ยาชาเฉพาะที่ร่วมด้วย (Infraorbital nerve block) และมีการยืนยันตำแหน่งของปลายหมุดด้วยการเอกซเรย์ก่อนที่จะตอก การดูแลหลังจากการถอนฟันนอกจากจะมีการให้ยาฆ่าเชื้อ (long-term broad-spectrum antibiotic) และยาลดอักเสบ (nonsteroidal anti-inflammatory drug) แล้วยังมีการใช้ยา Chlorhexidine gluconate ล้างปากด้วย

คำสำคัญ: : ตัวและรากฟันแตกแบบซับซ้อน Steinmann pin repulsion technique การส่องกล้องผ่านปาก

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The Management of Complicated Crown Root Fracture in Equine Molar: A Case Report

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Abstract: Equine dental disease such fracture tooth required correct technique and right equipment to achieve the best outcome. A sixteen years old warmblood gelding presented with loss of appetize and change of riding behavior. The oral examination using oral endoscope and radiographic image was carried out under standing sedation using combination of Detomidine hydrochloride and Butorphanol tritate. The diagnosis was complicated crown and root fracture of 109, the tooth was successfully removed using Steinmann pin repulsion technique (SPR) after failure of others technique. After one month post-operatively, the horse recovered well without any sign of sinusitis. SPR should be the last resort for removing equine tooth due to high rate of complication such recurrent sinusitis, remaining of root fragment, and extraction of non-disease tooth. In order to minimize complication, the horse must be under heavy sedation with local anesthesia (infraorbital nerve block for this case) then the disease tooth was located, and pins guided using radiograph. Post-operative care includes oral rinse with Chlorhexidine gluconate, oral medication of long-term broad-spectrum antibiotic, and nonsteroidal anti-inflammatory drug.

Keywords: Complicated crown root fracture, Steinmann pin repulsion, Oral-endoscope, Horse

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Introduction

Horse have various types of complication associated with their teeth such as sharp teeth, malocclusion, periodontal disease, pulpitis, and fracture. Many of these complications causing severe pain lead to weight loss and behavior changes which may require extraction of disease tooth. Common

indications for extraction include severe periodontal disease, pulp exposure, fracture of teeth, fracture of mandible, periapical tooth root abscess, sinusitis, and neoplasia. (Chinkangsadarn *et al*., 2015) Complicated crown root fracture (CCRF) is the fracture of crown and root that exposes the pulp, which can be found in all age (Stephen, 2010). The keys of identify CCRF consists of a through oral examination with good sedation, light source and oral endoscope, radiographic image for confirming the tooth and type of lesion. After confirming the disease tooth, there are three methods to perform molar extraction. Firstly, conventional intraoral extraction is the most effective and less complication method. Second, minimal invasive buccotomy and screw extraction (MTE) which require special skill and equipment. Lastly, Steinmann pin repulsion which has the most complication and considered the final way to extraction. (Thomas, 2013) Complication rate after tooth repulsion is as high as 47% in maxillary tooth. The post-operative complication such as infection of second tooth, bone sequestration, chronic sinusitis, training tracts, retained dental packing, feed impaction of alveolus or sinus, suture line dehiscence or skin flap sloughs. (Prichaed *et al*., 1992)

Case detail

In this case, a sixteen years old warmblood gelding presented with loss of appetize, quidding, weight loss and riding misbehavior. The initial oral examination was performed in June, 2017 using Detomidine hydrochloride (Dozadine®) 0.02mg/kg IV for standing examination in crush. The diagnosis was CCRF of upper right first molar (109, according to modify trident system). The radiographic image indicated periapical lesion require extraction of disease tooth. Intraoral extraction technique was attempted, however, 109 has shallow crown due to type of fracture which molar forceps could not place with firm grip. Only partial piece of crown was removed, second technique as Minimal invasive Transbuccal Extraction (MTE) was advice for the owner. As requested from owner to postpone and reschedule the surgery on December 2018.

On second visit horse was sedated with Detomidine hydrochloride (Dozadine®) 0.02 mg/kg IV for a through oral examination with aids of intraoral endoscopic camera and radiograph shown remaining of fractured 109 with multiple pulp exposure (Figure 1 and 2). The additional sedation of Detomidine hydrochloride (Dozadine®) continuous rate infusion (CRI), Butorphanol tritate 0.02mg/kg IV and Infra-orbital nerve block with Lidocaine HCL were given 15 minutes before MTE was

carried out (Lyon, 2016). The attempt was unsuccessful as we cannot properly place tabs and screw on the disease tooth due to size and less integrity of tooth structure.

The third technique, Steinmann pin repulsion, was again advise to the owner in order to successfully remove all fracture pieces of disease tooth. The customs made 6mm. stainless-steel pins design for tooth repulsion was use with surgical staple and radiographic image guided as shown on Figure 3. The disease tooth was successfully removed with confirmation of radiographic image (Figure 4).

It has been used for extraction cheek teeth without crown or small crown. Although, this technique needs trocar and cannula put through the cheek then loose teeth with elevator and drilled the effected teeth pass buccal cannula, tap pin screw into the teeth (David, 2016), this technique is not success because of multiple comminuted fracture. It impossible to drill into every pieces of fracture teeth.

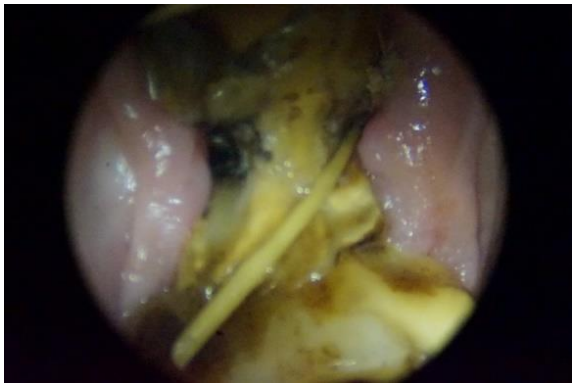

Figure 1 image of fracture 109 from intraoral camera

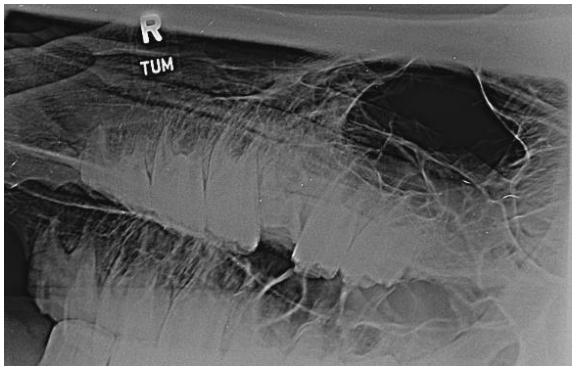

Figure 2 Radiographic image of upper right arcade

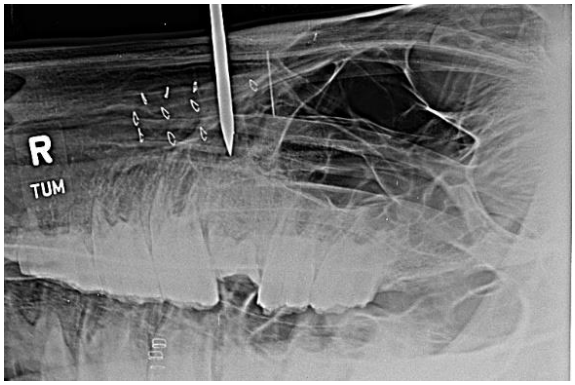

Figure 3 Staple and radiographic image for pin placement

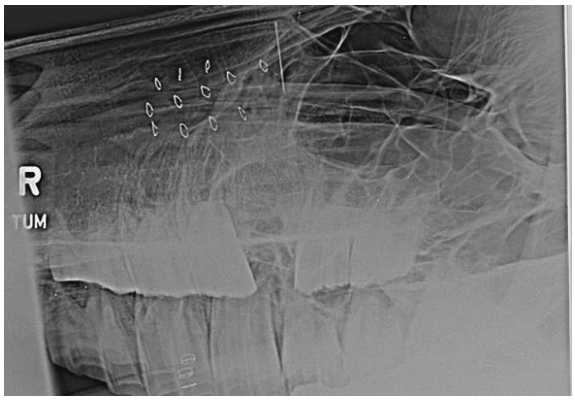

Figure 4 post-operative radiographic image

Finally, minimal invasive trephine and Steinmann pin repulsion technique has used to extract this tooth. Repulsion usually become the treatment of last resort in most

cases although it has risk to be sinusitis. It is reserved for patients that resent loosening by intraoral and trans buccal had failed (David, 2016).

Post-operative care, tetanus toxoid vaccination was given soon after the horse have fully recover from sedation and intramuscular injection Procaine Penicillin G , Benzathine Penicillin G and Dihydrostreptomycin sulfate (Pendistrep L.A.®) dose 22000 IU/Kg Procaine Penicillin G twice a day for 7 days and Phenylbutazone (Butasyl®) dose 4.4 mg/kg daily for 5 days (Boutros and Koenig, 2001). Wound dressing and make oral rinse with chlorhexidine every day in first week after surgery.

Follow up in first month after extraction with oral examination and radiograph. For oral examination, we found a good healing of gingiva with remaining of a small sinus track [Figure5]. The horse can eat well and return to normal work. There are not sign of sinusitis.

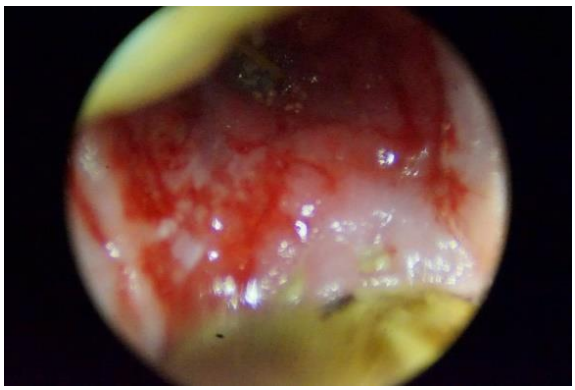

Figure 5 intraoral image 3 months post-operative

Discussion

Diagnostic technique for this CCRF require complete oral examination with oral radiographic image. Complete oral examination using oral-endoscopic camera found to be very useful for diagnosis and record of dental disease progression along extraction forceps (Allison and Robert, 2017). Radiographic imaging is undeniable as diagnostic techniques and confirm location of dental disease, in this case extra-oral radiography was used for diagnosis and guidance of pin placement. However, intra-oral technique for horse has been discussed to be advantageous for apical areas of molar and sinuses. However, intra-oral may not be benefit for this case on treatment planning on locating of Steinmann pin placement due to small size plate.

Standing sedation for oral surgery in horse is recommended over general anesthesia as it provide upright position of horse head, less risk on recovery phase of general anesthesia and less bleeding from surgical site as the head is rise above the heart. The standard sedation protocol for equine standing surgery are combination of α- 2 agonist and opioid analgesic, in this case we choose to use Detomidine hydrochloride (Dozadine®) and Butorphanol tritate as they provide good patient control with long duration by using CRI technique. Additional

of pain control using local anesthesia or nerve block also crucial. Nerve block for surgical of 109 in this case was infra-orbital nerve block as it very easy to perform with low risk of penetrating to maxillary artery and providing adequate effect.

Steinmann pin repulsion technique, it can extraction cheek teeth without crown and complicated fracture cheek teeth. This method is clearly to extraction all part of fracture, but it risks to be sinusitis. This case has no any problem with sinusitis because of sterile equipment and technique in surgery. Although one study has been reports 47% complicated rate of horses after tooth repulsion (Prichaed *et al*., 1992). The most important thing to use in repulsion methods are external marking external guided line [Figure2] and radiographs. It helps to locate a point to placement trephine and Steinmann pin. Our external marking guide is medical staples. The tip off Steinmann pin should be on apex of root or fragment [Figure3]. Pin position should be confirmed frequently with radiographs in external oblique view. After tooth or fragment have pushed into the mouth, radiographs are recommended for every extraction procedure to ensure any dental fragments have been left in mouth. In this case, 6 mm self-made Steinmann pin had chosen for extraction. After clear CCRF completely [Figure4], close external wound with medical staple. The advantage of this technique is the horse can be performed in standing position.

In post-operative care, should control pain and infection carefully. The surgical sites should be rinsed with antimicrobial rinse (0.12% chlorhexidine) twice a day in first week or until wound healing. After surgery, this case is very good result, horse has good healing and there are not sign of sinusitis. The horse can eat well and return to normal work in one month after surgery. Some older horses can not eat much enough may need another supplement and senior pelted feed to maintain weight.

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