

## Surgical treatment of a penetrated metallic foreign body in the oral cavity wall of a mare

Alireza Rahmani Shahraki<sup>1</sup>, Abbas Raisi<sup>2\*</sup>

<sup>1</sup> Private Veterinary Practitioner, Shahrekord, Iran; <sup>2</sup> Department of Clinical Sciences, Faculty of Veterinary Medicine, Lorestan University, Khorramabad, Iran.

Article Info	Abstract
<p><b>Article history:</b></p> <p>Received: 23 May 2018 Accepted: 25 September 2018 Available online: 15 June 2019</p> <p><b>Key words:</b></p> <p>Mare Metallic foreign body Oral cavity wall Surgical management</p>	<p>One of the reasons of weight loss and poor performance in horses is decrease in food intake. Oral cavity problems can cause malfunctions in prehension and deglutition resulting in dysphagia. There are few published reports about a metallic foreign body disorders in the oral cavity of horses due to an important role of their flexible lip and incisor teeth in food selection and prehension. This report describes the history, clinical, hematological and radiographic findings and surgical management of a left oral wall fistula formation due to a piece of wire penetration in a pregnant mare. The wire was removed through surgical intervention in a standing position of the horse under mild sedation and local anesthesia. One-month follow-up examination showed that the mare had regained her previous work performance with no post-operative complication. Precise oral examination and using an ancillary diagnostic device such as radiography can be suggested for oral cavity pathologies detection and accurate diagnosis in horses.</p>

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### درمان جراحی یک جسم خارجی فلزی متنفذه در دیواره حفره دهانی یک رأس مادبان

#### چکیده

یکی از دلایل کاهش وزن و عملکرد ضعیف در اسب ها کاهش دریافت غذا می باشد. مشکلات حفره دهانی می توانند باعث اختلال در گرفتن و جویدن شوند که سختی بلع غذا را در پی خواهد داشت. گزارش های اندکی در مورد اختلالات جسم خارجی فلزی در حفره دهانی اسب ها به سبب نقش مهم لب های قابل انعطاف و دندانهای نیش آنها در انتخاب و اخذ غذا وجود دارند. این گزارش تاریخچه، یافته های بالینی، خون شناسی، پرتونگاری و مدیریت جراحی شکل گیری فیستول در سمت چپ دیواره دهان ناشی از نفوذ یک قطعه سیم را در یک رأس مادبان آبتن شرح می دهد. سیم به واسطه مداخله جراحی در موقعیت ایستاده اسب تحت آرام بخشی و بی حسی موضعی برداشته شد. پیگیری به عمل آمده پس از یک ماه از عمل نشان داد که مادبان عملکرد قبلی خود را بدون هیچ گونه عوارض جراحی به دست آورده بود. معاینه دقیق دهانی و استفاده از وسیله تشخیصی کمکی مانند رادیوگرافی جهت ردیابی و تشخیص دقیق آسیب شناسی های حفره دهانی در اسب ها می تواند پیشنهاد شود.

**واژه های کلیدی:** جسم خارجی فلزی، دیواره حفره دهانی، مادبان، مدیریت جراحی

#### \*Correspondence:

Abbas Raisi. DVM, DVSc  
Department of Clinical Sciences, Faculty of Veterinary Medicine, Lorestan University, Khorramabad, Iran  
E-mail: raisi.a@lu.ac.ir



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## Introduction

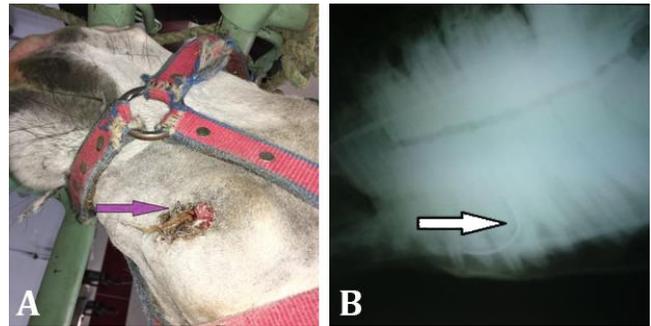
Decrease in food intake causes weight loss and poor performance in horses. Oral cavity disorders can cause prehension and deglutition malfunctions resulting in dysphagia. Dysphagia can result from a number of disorders affecting any part of the upper gastrointestinal system including oral cavity.<sup>1,4</sup> Clinical signs of dysphagia depend on the cause of disease including oral cavity abnormalities and obstruction or inflammatory conditions.<sup>3</sup> Due to the grazing habit of the horses, the probability of foreign bodies penetration in oral cavity is uncommon.<sup>4</sup> Although there are a few reports regarding metal foreign bodies penetration in tongue, pharynx and sub-mandibular region,<sup>5</sup> some foreign bodies can wedge between the molar teeth or under the tongue. Metallic foreign body might be penetrated into the deep soft tissues of the oral cavity, therefore, they could be overlooked in routine oral examinations. Radiography can be used as a valuable diagnostic tool to identify the metallic foreign body and can help the examiner in differential diagnosis and to choose the best approach for surgery.<sup>5,6</sup> Ultrasonography is another useful technique to detect the position of the object and to evaluate the affected soft tissue abnormality.<sup>7</sup> This case report describes the history, clinical signs, hematological and radiographic findings and surgical management of a left buccal cavity fistula formation due to a piece of wire penetration in a pregnant mare.

## Case Description

A 12-year-old Kurd breed mare at the sixth month of her pregnancy was referred to the Veterinary Teaching Hospital of Lorestan University, Khorramabad, Iran in September 2017 with a chronic discharging open wound located on the left mandible area between first and third premolar teeth (Fig. 1A). In the history of the mare, there was a difficulty in foods chewing due to oral wall swelling for 15 days. The mare had firstly received penicillin G procaine and dihydrostreptomycin (1.00 mL per 25 kg, IM; Norbrook, Newry, Northern Ireland), daily for seven days and phenylbutazone (2.00 mg kg<sup>-1</sup>, IV; Aburaihan Pharma Co. Tehran, Iran) for three days. Two weeks after the above treatment, the jaw swelling was markedly subsided due to the skin tearing down; though open wound tract was cleaned daily with povidone iodine (0.50% aqueous solution) for 10 days. Two weeks after the local soft tissue irrigation, suddenly the solution was spilled out into the mouth. Therefore, the mare was referred to the University Teaching Hospital for more accurate clinical and diagnostic interventions by local veterinarian.

Upon admission, routine clinical examinations were performed and cardiovascular, respiratory and gastrointestinal parameters were in normal ranges except for inappetence, but there was a small bulging mass

containing a narrow opening and a little granulation tissue growth in the mid-left mandible. On palpation, the mass was firm and painful. Blood sample was taken from jugular vein and leukocytosis was remarkable (total white blood cell: 17,000 per  $\mu$ L; neutrophil: 55.00%; band cell: 13.00%; monocyte: 2.00%; lymphocyte: 29.00%; PCV: 39.00%). Head radiography was taken in a lateral position (10 mA, 60 Kv) with a diagnostic X-Ray device (PXP-20HF; Poskom, Goyang, Korea). There was a semi-circular radiopaque foreign body on the left mandible seemed to be a metal object and some soft tissue swelling was detected (Fig. 1B). No other abnormality was seen and neither abnormal opacity nor structural displacement was detected.

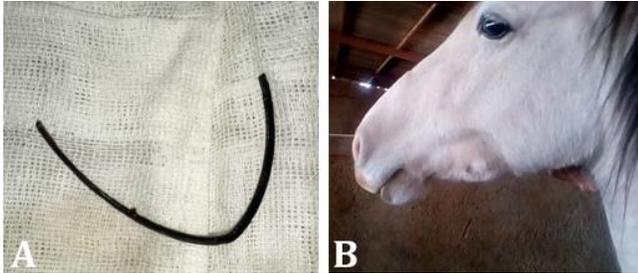


**Fig. 1. A)** Chronic open oozing wound over the left mandible, and **B)** Semi-circular radiopaque object over the left mandible in a lateral radiograph.

Surgical intervention was done in standing position. The mare was restrained physically in a horsebox and the horse eyes were covered by a towel. Then, she was sedated with a combination of acepromazine (0.05 mg kg<sup>-1</sup>, IV; Alfasan, Woerden, Netherlands) and xylazine (0.50 mg kg<sup>-1</sup>, IV; Alfasan). Following local anesthesia using lidocaine HCl (1.00 mL per cm<sup>3</sup>; Shahid Ghazi, Tabriz, Iran), the skin was shaved and aseptic preparation was done routinely with scrub solutions. A linear skin incision was made in a rostro-caudal direction beyond the fistula. Blunt and sharp dissections were performed through a formerly inserted sterile catheter and the fistula tract was removed completely. The wire was identified, detached from the adjacent soft tissues and finally removed by forceps (Fig. 2A). The exuberant subcutaneous granulation tissue was removed by sharp incisions and warm normal saline was used for cleansing of the affected soft tissues. The skin incision was closed with number 0 nylon (Supa, Tehran, Iran) in cruciate pattern and the distal part of skin incision was left open for probable exudate drainage.

For post-operative medication, penicillin G procaine and dihydrostreptomycin (see above) were administered for five consecutive days and phenylbutazone (2.00 mg kg<sup>-1</sup>, IV; Aburaihan Pharma Co.) was administered for three consecutive days. Also, local skin cleansing and irrigation were done with 0.50% aqueous solution of povidone iodine (Behsa Pharmaceutical Co., Arak, Iran) for seven days. The mare was discharged from the hospital after

three days and soft food diet was suggested for one week. No surgical complication was recorded in a one-month follow-up examination and the skin wound was also repaired well (Fig. 2B). The mare regained her previous condition and performance.



**Fig. 2. A)** Photograph of the surgically removed semi-circular wire, and **B)** One month after surgery; the swelling was subsided and the skin wound has been closed well.

### Discussion

There are some physiological differences in food taking up among horses and other domestic animals.<sup>5</sup> Mastication is a complex procedure involving both chewing and manipulation of a food bolus. Muscles of the jaw produce chewing movements, while tongue and cheek muscles manipulate a food bolus. The masticatory muscles deliver varying forces to the teeth during mastication in compensation for feed characteristics. Mouth problems can disrupt mastication leading to inappetence and weight loss in horses.<sup>8</sup> In the horse, flexible lip and incisor teeth have an important role in food selection and prehension, while cattle use muscular and powerful tongue to pull mixed and non-selected hay and grass into the mouth. Occurrence of metallic foreign body in the oral cavity of horse is rare and uncommon due to eating behavior, but some reports have talked about horse mouth problems regarding metal foreign body in pharynx, oral cavity,<sup>1,5</sup> retro-pharyngeal<sup>7</sup> area, tongue,<sup>9</sup> sub-mandibular region,<sup>10</sup> and stomach.<sup>11</sup> Although the horse is naturally free grazing, in recent decades, due to increase in horse population, horse industry advancement and reduced rainfall and rangeland for grazing, horses are more often maintained in the stables and fed manually. In addition to the advancement and mechanization of the agricultural industry, the likelihood of the foreign objects entry (such as wire of tractor tire, etc.) in the horses' food has been increased.<sup>6</sup> When sharp metallic objects enter the oral cavity, they can lacerate and/or penetrate soft tissue due to the movement of powerful tongue. Pain, inflammation and upper gastrointestinal tract swelling can cause dysphagia and anorexia; hence, foreign objects play an important role in immediate weight loss and performance and body condition reductions.<sup>12</sup> Some issues such as trauma, dental disease, neoplastic diseases and foreign bodies in oral cavity must be differentiated for the best

treatment protocol.<sup>12</sup> In this case, the metal wire removal was carried out in a standing position through physical restraint, chemical sedation and local anesthesia due to the mare pregnancy. Reportedly, penetrated metal body could be retracted easily from tongue or mouth<sup>9</sup>; however, in our treated case, the metal body was deeply located into oral wall soft tissues and in line with that, its removal through the skin fistula tract was decided. Perfect oral examination and using an ancillary diagnostic device such as radiography can be suggested for buccal cavity pathologies detection and accurate diagnosis in horses.

### Conflict of interest

The authors declare that there is no conflict of interest.

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