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Fused incisors in case of a compound odontoma in a horse: Diagnosis and treatment

Theodorus V. A. F. van Delft[1], Astrid Bienert-Zeit[2] and Carsten Staszyk[3]

[1] Equine Dental and Veterinary Care, Oud-Turnhout, Belgium
[2] Clinic for Horses, University of Veterinary Medicine Hannover, Foundation, Germany
[3] Institute of Veterinary Anatomy, -Histology and -Embryology, Faculty of Veterinary Medicine, Justus-Liebig-University Giessen, Giessen, Germany

Summary: When finding a malformed tooth structure during oral examination, it is difficult to determine if this abnormality is a dysmorphic tooth or an odontogenic neoplasia. Abnormally shaped teeth and odontogenic neoplasia can have a similar clinical appearance. Conditions that cause disturbances in odontogenesis can lead to abnormally shaped teeth. Odontogenic neoplasia derives from uncontrolled- and unlimited growth of dental tissues. Although the clinical symptoms caused by dysmorphic teeth and odontogenic neoplasia might be very similar, these different conditions feature different cellular characteristics regarding the potential risk for further expansion and the prognosis for recrudescence after treatment. For this reason, histopathological examination is required to reach a definitive and correct diagnosis. Odontoma are odontogenic tumours that contain all dental substances with an arrangement that differs from that found in normal teeth. They are further classified as complex- or compound odontoma. Both types are considered to be hamartoma (hyperplastic masses or overgrowth formations of normal tissue) rather than true neoplasia, because of the presence of complete differentiated dental tissues. This case report describes the clinical-, radiological- and histopathological findings that led to the diagnosis of compound odontoma in a 10-year-old gelding with a malformed tooth structure that caused periodontal disease at the position of tooth 202. Treatment included exodontia of the compound odontoma. During surgery, it became clear that the compound odontoma involving retained deciduous incisor 602 had caused fusion by concrescence with the non-erupted permanent incisor 202 – a condition that is hardly ever diagnosed in the horse. The fused teeth were successfully removed using intraoral tooth segmentation, a technique that can facilitate exodontia and reduce the risk of collateral tissue damage.

Keywords: fused incisors / compound odontoma / equine dentistry / exodontia / intraoral tooth segmentation

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Correspondence: Theo van Delft, Equine Dental and Veterinary Care, Steenweg op Ravels 285, 2360 Oud-Turnhout, Belgium; e-mail: info@edvc.nl

Introduction

Dysmorphic teeth and odontogenic neoplasia may have a similar clinical appearance (*Knottenbelt* and *Kelly* 2011). Two shared characteristics are an enlarged size and/or an abnormal shape of the tooth (*Dixon* 2011, *Knottenbelt* and *Kelly* 2011). This may cause similar clinical symptoms in terms of maxillary or mandibular swellings and uneven tooth alignment (*Hackett* and *Baxter* 2008, *Dixon* 2011).

Several conditions (i.e. genetic aberrance, chronic inflammation and- trauma) are known to cause disturbances in odontogenesis, which subsequently leads to abnormally shaped teeth (*Dixon* 2011, *Knottenbelt* and *Kelly* 2011). Depending upon the type and the timing of the disturbance, a wide range of dental malformations are possible, e.g. deviations in the shape of crown and/or root, as well as fusion of individual tooth germs, resulting in conglomerates of several teeth (*Kneževi* et al. 2002).

Odontogenic neoplasias, which are rarely diagnosed in the horse, derive from uncontrolled- and unlimited growth of dental tissues (*Morgan* 2011, *Wohlsein* and *Baumgärtner* 2011). They are categorised according to the degree of differentiation and on the basis of the embryonic tissues of origin, which can be epithelial (e.g. ameloblastoma), mesenchymal (e.g. cementoma), or a mixture of both cell types (e.g. ameloblastic fibroma) (*Hackett* and *Baxter* 2008, *Wohlsein* and *Baumgärtner* 2011, *Amory* et al. 2014). Odontogenic neoplasia manifest as slow-growing, non-painful, firm, maxillary- or mandibular swellings (*Hackett* and *Baxter* 2008, *Knottenbelt* and *Kelly* 2011). They can be benign or non-metastasising malignant; local invasion into surrounding tissues is common (*Hackett* and *Baxter* 2008, *Knottenbelt* and *Kelly* 2011, *Amory* et al.2014).

A special type of dental malformation is the odontoma. These are odontogenic tumours composed of tissues that derive from both epithelial- and mesenchymal origin (*Brounts* et al. 2004). It must be emphasised that odontoma are considered to be hamartoma (i.e. non-neoplastic, benign, overgrowth tissue, typical and indigenous for the respective site), rather than true neoplasia (*Neville* et al. 2009, *Gruber* and *Klopfleisch* 2011).

Although clinical symptoms caused by dysmorphic teeth and odontogenic neoplasia might be very similar, these different conditions feature different cellular characteristics with regard to the potential risk of further expansion and the prognosis for recrudescence after treatment. For this reason, histopathological examination and definitive diagnosis are desirable (*Knottenbelt* and *Kelly* 2011).

Exodontia in the horse can be a technically challenging procedure and high incidences of complications have been described (*Tremaine* and *Schumacher* 2011). Although complications of incisor exodontia have been described as few, exo-

dontia of a malformed- or malpositioned incisor can be a difficult procedure (*Tremaine* 2006, *Rawlinson* 2012). Over the last 20 years, improvement of oral examination, diagnostic imaging, instrumentation, and extraction techniques have led to a more precise surgical procedure. This has helped to minimise collateral damage and decrease the risk of complications (*Rawlinson* and *Carmalt* 2014).

This case report describes the diagnosis and treatment of a malformed- and malpositioned tooth. Successful exodontia using an intraoral segmentation technique is described.

Case report

History

A 10-year-old, approximately 650 kg Argentine Criollo gelding used as pleasure horse, was referred for evaluation and further treatment of a malformed- and abnormally erupted incisor, with a hard swelling just above the clinical crown under the gingiva. The owner reported that the situation had been like this for several years previously without any obvious changes. Several remnants of deciduous incisors were removed when the horse was 4.5 years old. The horse had been eating and performing normally and no signs of pain had been observed.

Clinical findings

On presentation, the horse was bright, alert, and all parameters of the clinical examination were within normal limits. Intraoral examination showed a malformed incisor with a small and short clinical crown at the position of tooth 202, which was not in occlusion (Fig. 1a). The clinical crown showed discoloration of the enamel and a widened infundibulum impacted with food. Food impaction was also seen in the widened interproximal space between the malformed incisor and tooth 203, which resulted in irritation and retraction of the mesial gingival margin of tooth 203. A solid swelling above the gingival margin measured 3 cm × 1 cm × 1 cm and

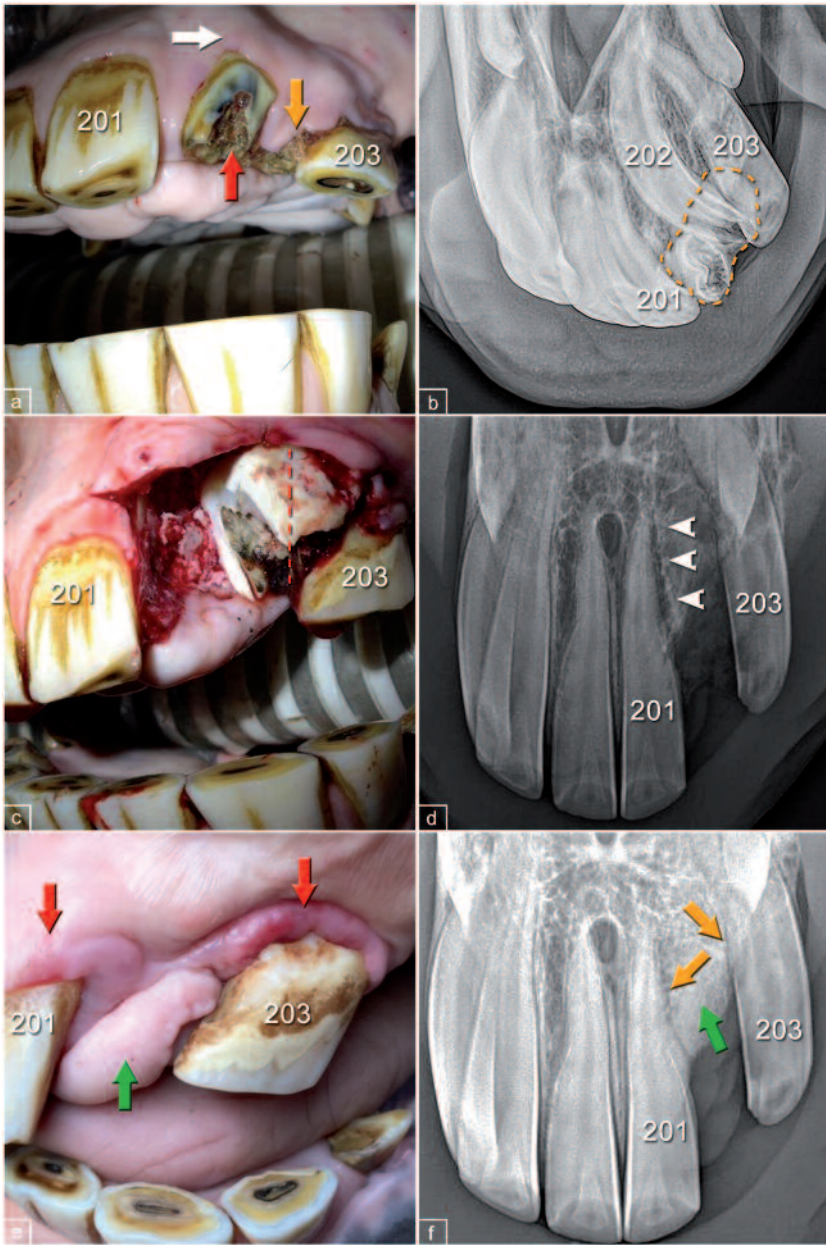

Fig 1 Photographs and radiographs before surgery (a,b), during surgery (c), immediately after surgery (d), and six months post-surgery (e,f). a) The malformed incisor at the position of the 202. Red arrow: discolouration and enlarged infundibulum impacted with food. Orange arrow: food impaction and retracted gingival margin around 203. White arrow: hard swelling above the gingival margin. b) Radiographic projection (+35°, +55°) of the rostral maxilla. Orange line: the clinical crown of the malformed incisor that appeared to be part of a larger malformed tooth structure with a rounded apex that was malpositioned and overlapping tooth 203. Image with courtesy of Tierarztpraxis Winand. c) The malformed tooth structure after removal of the rostral part using intraoral segmentation technique. Red line: line where the second segmentation cut was made. d) Radiographic projection (0°, +45°) revealed complete removal of the malformed tooth structure including incisor 202. A rough appearance of the alveolus of tooth 201 can be noticed (arrowheads). e) Green arrow: the alveolus of 202 shows a complete covering with epithelial tissue. Red arrows: minor inflammation of the gingival margin distal of tooth 201 and around tooth 203. f) Radiographic projection (0°, +45°). Green arrow: the alveolus of the 202 was filled with new formed bone tissue. Orange arrows: adjacent to teeth 201 and 203 a corrugated periodontal space is visible.

was not painful on palpation. The gingiva covering the swelling did not show any signs of inflammation.

Intraoral radiographs of the upper incisor arcade were taken with the projection angles (0°, +45° and +35°, +55°), according to the so-called 'Hemisphere Model' (*Stoll* et al. 2011). Radiographic images showed that the clinical crown of the malformed incisor was part of a larger malformed and malpositioned tooth structure (Fig. 1b). A non-erupted incisor was also visible, which was overlaid by the malformed tooth structure. This non-erupted incisor was of normal shape but displaced and twisted towards lateral.

Differential diagnosis and treatment plan

Based on the clinical and radiological findings, the malformed- and malpositioned tooth structure was identified as retained deciduous incisor 602 and featured a widened and necrotic infundibulum. The tooth was abnormally shaped and of enlarged size, preventing normal eruption of the permanent incisor 202. Oral extraction to remove the malformed 602 and to potentially create space for normal eruption of the 202 was planned.

Treatment

Preparations were made for an oral extraction in the standing horse. Sedation with detomidine (Detosedan, Vetpharma Animal Health S.L., Barcelona, Spain; 0.02 mg/kg btw iv) and butorphanol (Butomidor, Vetoquinol GmbH, Ravensburg, Germany; 0.01 mg/kg btw iv) was used. Pre-operatively, the horse received flunixin meglumine (Flunixin 5%, Medistar Arzneimittelvertrieb GmbH, Ascheberg, Germany; 1.1 mg/kg btw iv). Tetanus toxoid (Equip T, Zoetis Deutschland GmbH, Berlin, Germany; > 30 IU im) was administered prophylactically because the horse had received its last tetanus vaccination two years earlier. After positioning the horse in stocks and sedation, a maxillary nerve block within the pterygopalatine fossa was performed according to the instructions of *Rieder* et al. (2016). Additionally, local anaesthesia of the gingiva and the periodontal space surrounding tooth 602 was performed using lidocaine (Lidocainhydrochlorid 2%, Bela-pharm GmbH & Co. KG, Vechta, Germany).

The labial gingiva that overlaid the malformed tooth structure was removed using a scalpel blade to give a better overview of the position of both clinical- and reserve crown. Different dental elevators and luxators were used to disrupt the periodontal ligament and loosen the tooth structure. However, after failing to gain enough mobility, it was decided to segment and extract the tooth in several parts. Two different sized diamond cut-off wheels (Fig. 2) were used to split the tooth structure into two parts, after which the smaller rostral part could be removed (Fig. 1c). Thermal damage of surrounding tissues was minimised by water-cooling during the segmentation. After removal of the mesial part, it became apparent that the leftover part of the malformed tooth structure was connected to the non-erupted displaced incisor 202. The fused teeth were further loosened, and after performing one more segmentation, the tooth segments were extracted by means of an extraction forceps. Due to the close position of the removed teeth to tooth 203, this tooth was slightly loosened during exodontia. The clinical crown of tooth 203 was reduced two millimetres to temporarily reduce occlusal pressure.

Curettage was performed and the alveolus was flushed with saline solution. Gauze impregnated with honey ointment (Mielosan®, CP Pharma Handelsgesellschaft mbH, Burgdorf, Germany) was placed on top of the formed blood clot within the alveolus. Since a more invasive surgery was required than expected, the horse was continued on oral phenylbutazone (Phenylbutariem, Ecuphar GmbH, Greifswald, Germany; 2.2 mg/kg btw po), once a day for four days. A post-extraction radiograph revealed complete removal of the malformed- and malpositioned tooth structure (Fig. 1d). Advice was given to the owner not to give the horse any hard food for at least two months.

Macroscopic pathological findings

The subocclusal part of the extracted tooth 202 featured a normal shape. Remnants of the periodontal ligament were attached to the surface of the tooth. At the occlusal part, the site of fusion with tooth 602 was clearly visible (Fig. 2a). Compared to a normal deciduous incisor, tooth 602 featured an enlarged mesiodistal length and a dysmorphic appearance, with no clear distinction between dental crown and root. The occlusal part showed a widened infundibulum filled with food material.

Horizontal sections were made using a diamond-coated band saw with water cooling to minimise frictional heat. On horizontal sections, dentin, cementum and enamel were identified, but were arranged in an abnormal pattern (Figs. 2b and 2c). In the occlusal aspects, black-coloured soft tissue was present, indicating local tissue necrosis.

Histopathological findings and diagnosis

For further histopathological investigations, sections of tooth 602 were decalcified (ethylenediaminetetraacetic acid [EDTA], room temperature, pH 8.0) and embedded in paraffin wax. Subsequently, serial 5μm sections were cut, stained with haematoxylin and eosin (H&E), and examined under a light microscope. The histological pictures were dominated by dentin and cementum. In minor parts of the sections, a regular arrangement of dentin and cementum, including regular attachment of periodontal fibres was present. Most portions of the sections featured either fragments of cementum and dentin intermingled with soft tissue (Fig. 3d), dentin formations embedded in cementum like tissue (Fig. 3e), or pieces of dentin and cementum arranged in irregular patterns (Fig. 3f). Focal spaces were identified, either filled with remnants of poorly mineralised enamel matrix (Fig. 3f) or without content. In those places, the enamel had been totally dissolved by the process of decalcification, but its former presence was confirmed by the identification of typically shaped, dentino- and cemento-enamel junctions (Fig. 3g). The histopathological features described led to the diagnosis of a compound odontoma. Tooth 602 was fused by concrescence to tooth 202. The teeth were focally fused to each other by masses of highly cellular and avascular, irregular cementum.

Follow up

The alveolus was examined at four- and eight days post-surgery by the referring veterinarian. Gauze was replaced after the first examination. After the second examination the alveolus was flushed with water daily for seven days. The horse was examined again at two and six months post-surgery. At two months, the alveolus was filled with granulation tissue and the loosened tooth 203 was no longer movable. At six months, minor inflammation of the gingival margin was seen distal of tooth 201 and around tooth 203 (Fig. 1e). A radiograph showed no abnormal tissue at the former site of the compound odontoma (Fig. 1f).

Discussion

The presented horse did not seem to have any clear signs of pain or oral discomfort, but food packing with signs of periodontal disease around the 203 was present. Untreated, this condition can continue and cause more severe inflammation of the periodontium and serious oral pain (*Collins* and *Dixon* 2005, *Dixon* et al. 2011). The clinical crown of the tooth structure was not in occlusion and part of the crown under the gingiva was malpositioned and overlapped incisor 203. This malocclusion and uneven tooth alignment could conceivably deteriorate over time and alter the position of other teeth (*Hackett* and *Baxter* 2008). Additionally, the risk that the peculiar tooth structure was an odontogenic neoplasia and the opportunity to create space for normal eruption of incisor 202 were indications to decide for exodontia.

The case describes the difficulties in determining if a malformed tooth structure is an abnormal tooth formation or an odontogenic neoplasia. The similar clinical appearance of the two conditions makes histopathological examination necessary reach a definitive and correct diagnosis (*Hackett* and *Baxter* 2008, *Knottenbelt* and *Kelly* 2011). In this particular case, obtaining a biopsy prior to treatment was difficult, because of the hard dental structures involved. For this reason, the whole structure was removed and examined.

According to the World Health Organization (WHO), odontoma contain all dental substances but their arrangement differs to that in normal teeth. Odontoma are histologically- and radiographically characterised by the production of pulp tissue, cementum, dentin and enamel (*Miloglu* et al. 2014). Odontoma are further classified as complex- or compound odontoma (*Philipsen* and *Reichart* 2002, *Morgan* 2011). Several cases of both complex- and compound odontoma in horses have been described (*Dillehay* and *Schoeb* 1986, *Dubielzig* et al. 1986, *Pirie* and *Dixon* 1993, *Brounts* et al. 2004, *Snyder* et al. 2008), however, to the best of our knowledge, no reports on compound odontoma associated with incisors has been published.

Compound odontoma are characterised as a mass-containing, well-differentiated, dental tissues that are well-organized as recognizable 'tooth-like' structures (*Eickhoff* et al. 2002, *Brounts* et al. 2004, *Knottenbelt* and *Kelly* 2011). For this reason, it was initially thought that the tooth structure in the described case was a dysmorphic retained deciduous incisor. Complex odontoma also contain well-differentiated dental tissues, but these are arranged in chaotic, disorganised masses, with no resemblance to normal, 'tooth-like' structures (*Eickhoff* et al. 2002, *Brounts* et al. 2004, *Knottenbelt* and *Kelly* 2011). Therefore, by definition, compound odontoma can distinguished from complex odontoma by means of order and organization,

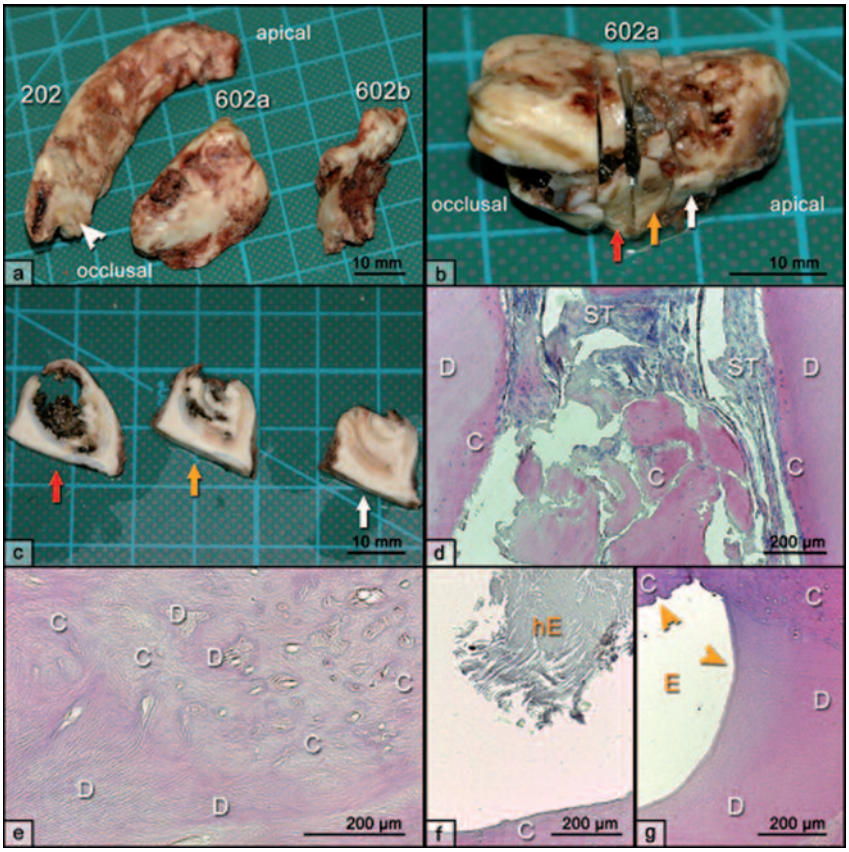

Fig 3 a) Teeth after intraoral segmentation and extraction. b) Fragment of tooth 602 after sectioning for histological investigations. Colored arrows indicate sections as shown in c). c) Sections of fragment 602a show an irregular composition of different dental substances. Black colorations indicate ongoing necrotic processes in the occlusal areas. d-g) Decalcified histological sections of tooth 602, H&E staining showing dentin (D), cementum (C), soft tissue (ST), hypomineralized enamel (hE) and mature enamel (E) in an irregular arrangement. Although the mature enamel has been dissolved due to the necessary decalcification process, its former position has been identified by the typical shapes of the cemento-enamel and dentino-enamel junction (arrowheads).

resulting in the presence or absence of 'tooth-like' structures. However, this definition is not unambiguous, but to some extent arbitrary (*Philipsen* and *Reichart* 2002, *Morgan* 2011). Due to the presence of well-differentiated dental tissues, both types of odontoma, and especially well-organised compound odontoma, are considered to be hamartoma rather than true neoplasia (*Neville* et al. 2009, *Gruber* and *Klopfleisch* 2011). Hamartoma are hyperplastic masses or overgrowth formations of normal tissue formed due to a developmental defect (*Pirie* and *Dixon* 1993, The Merck Veterinary Manual 1998, *Barakzai* 2008). Although the differentiation between a compound and a complex odontoma can be imprecise, it must be emphasised that both odontoma types are benign and only locally expansive (*Brounts* et al. 2004). For this reason, the prognosis for recrudescence after complete excision is fair to favourable (*Knottenbelt* and *Kelly* 2011, *Morawala* et al. 2014). In the presented case, the compound odontoma including the attached tooth 202 was completely removed and curettage of the alveolus was performed followed by flushing with saline solution. At six months post-surgery, no abnormal tissue was seen macroscopically or radiologically and recrudescence of the compound odontoma was no longer expected.

Tooth fusion arises through the union of two or more tooth germs during embryonic development (*Kneževi* et al. 2002). Fusion can be complete or incomplete, depending on the stage of development when this union took place (*More* and *Tailor* 2013). Fusion can occur at the level of enamel or enamel and dentin (*Thirunavukkarasu* and *Senthil Kumar* 2014). Concrescence of teeth is a form of fusion of two or more teeth and involves only cementum (*Meer* and *Rakesh* 2011). Concrescence can have a developmental cause, but can also occur due to traumatic injury or as an inflammatory response (*Ghom* and *Ghom* 2014). In the described case, fusion occurred due to exaggerated production of cementum in the compound odontoma.

Both an abnormal tooth formation, as well as a malformation, in terms of compound or complex odontoma, may alter normal tooth position, creating a malocclusion and influencing normal tooth alignment. Malocclusion and deviated tooth alignment expose the periodontal space and provide niches for food impaction, which is presumed to be the beginning of the vicious-cycle leading to periodontal disease (*Ramzan* 2010). In the described case, tooth 602 had a small clinical crown and was not in occlusion. Food impaction was already present between tooth 206 and tooth 203. Signs of periodontal disease, such as retraction of the rostral gingival margin of incisor 203, were also present.

Intraoral tooth segmentation is a technique that is frequently used in small animal dentistry during exodontia of teeth with more than one root (*Gengler* 2013, *Niemiec* 2016). A similar technique has been presented for cheek tooth removal in horses (*Hevesi* et al. 2016), but application of this technique during equine incisor exodontia has not been described. In the presented case, two diamond cut-off wheels with different diameters were used to dissect the malformed tooth structure. The technique facilitated exodontia and diminished the risk of collateral damage. Cutting burrs for mechanical widening of diastemata, or the use of a high-speed dental drill can also be applied (*Dixon* et al. 2008, *Rawlinson* and *Carmalt* 2014). Before the segmentation, the risk of spreading neoplastic cells in case of an odontogenic neoplasia was considered. Since the tooth structure was comprised of hard dental tissues and the characteristics of odontogenic neoplasia were described as benign or non-metastasising malignant and locally invasive (*Knottenbelt* and *Kelly* 2011), this risk was assumed to be minimal.

To perform exodontia, a maxillary nerve block in the extraperiorbital fat body was performed. Concerning the region of the tooth structure to be removed, an infraorbital nerve block, which is associated with lower risks, was also considered. The choice to perform a maxillary nerve block was made with consideration of the acceptance by the horse and the difficulty of correct placement, and thus effectiveness of the nerve block (*Tremaine* 2007, *Rieder* et al. 2016).

Packing the alveolus after exodontia prevents food impaction that can alter wound healing. Instead of using gauze impregnated with honey ointment, packing can also be performed using polysiloxane putty, dental wax, or gauze impregnated with an antibacterial drug (*Tremaine* and *Schumacher* 2011). Honey contains antibacterial properties and promotes wound healing (*Simon* et al. 2008). Packing the alveolus after exodontia might prevent the formation of a blood clot, which is necessary for alveolar healing (*Rawlinson* and *Carmalt* 2014). For this reason, it is important not to fill the apical part of the alveolus.

Incisor 203 was not extracted after it was slightly loosened during exodontia. The decision to leave the tooth was based on the fact that the equine periodontal ligament possesses unique capacities for cell proliferation and tissue regeneration (*Warhonowicz* et al. 2006). Therefore, the potential exists that anchoring between periodontal cementum from the incisor to alveolar bone could be restored after reattachment of functional collagen fibres of the periodontal ligament (*Staszyk* et al. 2015). The minimal reduction of the incisor temporarily removed occlusal pressure and led to reduced movement. Six months post-surgery, incisor 203 was no longer movable. Minimal inflammation of the gingival margin around incisors 201 and 203 was present, but no pockets or food entrapment were diagnosed. The horse will be continuously evaluated during the routine annual dental examinations.

Conclusion

Dysmorphic teeth and odontogenic neoplasia are not often diagnosed in horses, but they do occur, and incisors can also be affected. For a definitive diagnosis, a histopathological examination is necessary. It has been shown that intraoral tooth segmentation is a suitable and beneficial technique to extract malformed incisors. It is suggested to include this technique to the list of applicable techniques for equine exodontia.

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Zusammenfassung

Schneidezahnverwachsung in Folge eines zusammengesetzten Odontoms beim Pferd: Diagnose und Behandlung

Abnormal geformte Zähne und odontogene Neoplasien können ein ähnliches klinisches Erscheinungsbild haben und erzeugen häufig ähnliche klinische Symptome. Allerdings unterscheiden sich die beiden Veränderungen in ihren zellulären Eigenschaften, im Hinblick auf das Risiko einer weiteren Ausbreitung und auf das Rezidivrisiko nach einer Behandlung. Aus diesem Grund ist die histopathologische Untersuchung nötig, um eine definitive Diagnose zu stellen und damit eine geeignete Behandlung planen zu können. Genetische Abweichungen, chronische Entzündung und Traumata verursachen Störungen der Odontogenese, die in der Folge zu abnormal geformten Zähnen führen können. Abhängig von Art und Zeitpunkt der Störung ist eine umfangreiche Anzahl von Zahnmissbildungen möglich. Hierzu gehören sowohl Abweichungen in der Gestaltung von Krone und/oder Wurzel, als auch die Fusion verschiedener Zahnanlagen, wodurch Konglomerate mehrerer Zähne entstehen können.

Odontogene Neoplasien entstehen durch unkontrolliertes und unbegrenztes Wachstum von Zahngeweben und werden beim Pferd selten diagnostiziert. Die entstandenen odontogenen Neubildungen manifestieren sich klinisch als langsam wachsende, nicht schmerzhafte, harte Schwellungen am Ober- oder Unterkiefer. Sie können benigne oder nicht-metastasierend maligne sein, wobei es aber häufig zur lokalen Verdrängung der umgebenden Gewebe kommt. Odontome sind eine spezielle Form von Zahnmissbildungen, die als odontogene Tumore aus allen Zahnsubstanzen bestehen, aber in einer Anordnung, die sich stark von der gesunder Zähne unterscheidet. Man unterscheidet dabei zwischen komplexen oder zusammengesetzten Odontomen. Beide Formen gelten eher als Hamartome (=hyperplastische Massen oder Überwucherungen von normalem Gewebe) als als richtige Neoplasien aufgrund des Vorliegens von ausdifferenziertem Zahngewebe. Dieser Fallbericht beschreibt die klinischen, radiologischen und histopathologischen Befunde, die zur Diagnose eines zusammengesetzten Odontoms bei einem 10-jährigen argentinischen Criollo-Wallach geführt haben. Dieser hatte eine missgebildete Zahnstruktur an Position des 202, die in der Folge zu einer Parodontose in ihrer Umgebung geführt hat.

Bei der Maulhöhlenuntersuchung wurde ein missgebildeter Schneidezahn mit einer kleinen und kurzen Krone an Position des 202 vorgefunden, welcher sich nicht in Okklusion befand. Die klinische Krone zeigte eine Verfärbung des Zahnschmelzes, sowie ein verbreitertes Infundibulum gefüllt mit Futterresten. Futterreste waren ebenso in dem erweiterten Interproximalraum zwischen dem missgebildeten Schneidezahn und dem 203 zu sehen. Dies hatte zur Irritation und zum Rückzug des mesialen Zahnfleisches des 203 geführt. Oberhalb des Zahnfleischrandes war eine 3 cm × 1 cm × 1 cm große nicht druckdolente feste Schwellung zu palpieren. Die Röntgenbilder zeigten, dass es sich bei der klinischen Krone des missgebildeten Schneidezahnes nur um einen Teil einer größeren missgebildeten und fehlpositionierten Zahnstruktur gehandelt hat. Zusätzlich war ein nicht durchgebrochener Schneidezahn zu sehen, welcher durch die missgebildete Zahnstruktur überlagert wurde.

Anhand der klinischen und radiologischen Befunde wurde die missgebildete und fehlpositionierte Zahnstruktur als nicht durchgebrochener Milchschneidezahn 603 mit einem erweiterten, nekrotischen Infundibulum identifiziert. Der Zahn war abnorm geformt und vergrößert, so dass er dadurch den normalen Durchbruch des permanenten Schneidezahns 202 verhindert hatte. Obwohl das vorgestellte Pferd keine deutlichen Anzeichen von Schmerz oder Unwohlsein im Bereich der Maulhöhle zeigte, waren eingespießte Futterreste mit Anzeichen einer Parodontose um den 203 sichtbar. Dieser Zustand kann sich unbehandelt weiter fortsetzen und eine schwerwiegende Entzündung der Wurzelhaut mit deutlicher Schmerzhaftigkeit verursachen. Die klinische Krone der Zahnstruktur befand sich nicht in Okklusion und ein Teil der Krone unter dem Zahnfleisch war fehlpositioniert und überlappte sich mit dem Schneidezahn 203. Diese Malokklusion und die ungleichmäßige Zahnanordnung kann sich möglicherweise mit der Zeit verschlimmern und die Position weiterer Zähne verschieben. Außerdem waren das Risiko, dass es sich bei der abnormen Zahnstruktur um eine odontogene Neoplasie handelt, sowie die Wichtigkeit Platz für einen normalen Durchbruch des Schneidezahns 202 zu schaffen, Indikationen für die Zahnextraktion. So wurde die orale Zahnextraktion zur Entfernung des missgebildeten 602 geplant und um Platz zu schaffen für den potentiellen Durchbruch des 202. Während der Operation wurde deutlich, dass das zusammengesetzte Odontom den nicht durchgebrochenen Milchschneidezahn 602 einschloss, der wiederum durch Verwachsung mit dem nicht durchgebrochenen permanenten Schneidezahn 202 verbunden war. Dies ist ein Befund, der beim Pferd selten diagnostiziert wird. Die verwachsenen Zähne wurden erfolgreich mittels intraoraler Zahnsegmentation entfernt. Diese Technik kann die Extraktion vereinfachen und reduziert das Risiko der Schädigung von umgebendem Gewebe.

Die histopathologische Untersuchung des entfernten Materials führte zur Diagnose eines zusammengesetzten Odontoms. Odontome sind histologisch und radiologisch durch die Produktion von Pulpagewebe, Zement, Dentin und Schmelz gekennzeichnet. Der 602 war mit dem 202 verwachsen. Die Zähne waren fokal durch Massen von zellreichem, avaskulärem, unregelmäßigem Zement miteinander verbunden.

Missgebildete Zähne und odontogene Neoplasien werden selten beim Pferd diagnostiziert, kommen jedoch vor und können auch die Schneidezähne betreffen. Dieser Fall hebt die Schwierigkeiten hervor festzustellen, ob es sich bei einer missgebildeten Zahnstruktur um eine abnorme Zahnform oder eine odontogene Neoplasie handelt. Das ähnliche klinische Erscheinungsbild der beiden Diagnosen macht die histopathologische Untersuchung notwendig, um eine definitive und korrekte Diagnose stellen zu können. In diesem speziellen Fall war es schwierig vor der Behandlung eine Biopsie zu nehmen, da die harten Zahnstrukturen involviert waren. Aus diesem Grund wurde die gesamte Struktur entfernt und anschließend histopathologisch untersucht.

Schlüsselwörter: Schneidezahnverwachsung / Zahnheilkunde / zusammengesetztes Odontom / Zahnextraktion / intraorale Zahnsegmentierung