Esophageal obstruction in horses: a retrospective study of 34 cases

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Abstract — The major purpose of this investigation was to describe the causes, possible complications, and prognoses of horses with esophageal obstruction. Of 34 cases presenting with esophageal obstruction, 28 cases were due to impaction of ingesta. Obstruction due to pre-existing esophageal disease occurred in 4 horses with megaesophagus, in 1 horse with stricture in the upper third of the esophagus, and in 1 horse with esophageal diverticulum. There was no significant difference in the contamination of the trachea between horses that subsequently developed aspiration pneumonia and those that did not. The duration of esophageal obstruction prior to admission was significantly longer in horses that developed aspiration pneumonia (median 18, range 2–48 h) than in those horses that did not (median 4, range 0.5–48 h). Although the obstruction was relieved in all 34 horses, 4 were euthanized because of recurring obstruction due to megaesophagus ($n = 2$), esophageal diverticulum ($n = 1$), and esophageal stricture ($n = 1$).

Résumé — Obstruction œsophagienne chez les chevaux : étude rétrospective de 34 cas. Le but principale de cette recherche était de décrire les causes, les complications possibles et le pronostic chez des chevaux atteints d'obstruction œsophagienne. Des 34 cas présentés avec obstruction œsophagienne, 28 étaient reliés à l'impaction de l'ingesta. Des obstructions attribuables à des maladies œsophagiennes pré-existantes se sont produites chez 4 chevaux avec mégaœsophages, chez un cheval avec sténose au tiers supérieure de l'œsophage et chez un cheval avec diverticule de l'œsophage. Il n'y avait pas de différence significative dans la contamination de la trachée entre les chevaux ayant subséquemment développé une pneumonie de déglutition et ceux qui n'en avaient pas développé. La durée de l'obstruction œsophagienne avant l'admission était significativement plus longue chez les chevaux ayant développé une pneumonie de déglutition (médiane 18, durée 2–48 h) que chez ceux qui n'en avaient pas développé (médiane 4, durée 0.5–48 h). Bien que l'obstruction ait été soulagée chez les 34 chevaux, 4 ont été euthanasiés suite à une obstruction récurrente reliée soit à un mégaœsophage ($n = 2$) soit à un diverticule ($n = 1$) soit à une sténose ($n = 1$).

(Traduit par docteur André Blouin)

Introduction

Causes of esophageal disease in the horse include obstruction, trauma, inflammation, and disturbances in motility (1–3). Intraluminal obstruction is the most common abnormality and is usually due to impaction with pieces of sugar beet, apple, or carrots, or pelleted or coarse food (3–6).

Regardless of the cause, almost all esophageal diseases result in impaired passage of food, with characteristic clinical signs (1–3,5). Nasal discharge containing saliva and food, excessive salivation, coughing, colic, sweating, gulping, and extension of the head and neck may occur at various times after eating and may vary in severity (1–4,6). Besides the clinical signs, passage of a nasogastric tube, esophagoscopy, and contrast radiography are diagnostic aids that may elucidate the etiology of the obstruction (1,3).

In cases of simple esophageal impaction, the prognosis is good (6). However, with obstruction due to functional or morphological abnormalities, the prognosis is poor (6). The goal of this study was to describe the causes, clinical signs, and complications of esophageal obstruction in 34 horses and to determine criteria for prognosis.

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Materials and methods

Thirty-four cases were examined in this study that were admitted to the Clinic of Veterinary Internal Medicine and Veterinary Surgery, University of Zurich between January 1993 and April 1998 because of esophageal

obstruction, including 26 horses and 7 ponies of various breeds, and 1 donkey. The animals' ages varied from 6 mo to 32 y (mean 10.5, $s = 8.7$ y). The etiology, clinical signs, treatment, and prognosis of the disease were evaluated retrospectively. Horses underwent clinical examination and endoscopy of the esophagus and trachea. The degree of tracheal contamination was defined as "none," when there were no visible food particles; "mild," when there were single food particles seen in the trachea; "moderate," when small amounts of transparent or green-colored fluid were seen on the tracheal floor; and "severe," when large amounts of green-colored fluid containing food particles were visible on the tracheal floor and food particles were seen in the dorsal aspect along the whole trachea. Additionally, the esophagus and lungs were radiographed. The horses were either sedated with xylazine (Rompun, Bayer AG, Leverkusen, Germany), 0.4 mg/kg body weight (BW) and given the spasmolytic metamizole (Vetalgin, Veterinaria AG, Zurich, Switzerland), 40 mg/kg BW, both administered intravenously (IV), or they were put under general anesthesia ($n = 2$) by using xylazine (1.1 mg/kg BW) and ketamine hydrochloride (Narketan 10, Chassot AG, Bern, Switzerland), 2.2 mg/kg BW, IV. The obstruction was then relieved by lavage of the impaction via a nasogastric tube or retrograde removal of solid food particles. Penicillin G (Penizillin-Natrium, Streuli and Company, Uznach, Switzerland), 30 000 IU/kg BW, and gentamicin sulfate (Gentamycin, Streuli), 5 mg/kg BW, were administered, IV, q12h for 5 d. In addition, dembrexin (Sputolysin, Böhringer Ingelheim, Basel, Switzerland), 0.3 mg/kg BW, and clenbuterol (Ventipulmin, Böhringer Ingelheim), 0.8 µg/kg BW, were administered, PO, q12h, in case of food aspiration. Flunixin meglumine (Finadyne, Essex Tierarznei, Munich, Germany), 0.4 mg/kg BW, IM, q8h for 3 d, was given to 9 horses.

A diagnosis of aspiration pneumonia due to esophageal obstruction was made based on clinical signs and concurrent radiographic evidence of alveolar or bronchoalveolar densities in the caudoventral region of the lungs.

Data were analyzed by descriptive statistics, the t-test, and Fisher's exact test. All computations were performed by using a computer program (Systat 7.0 for Windows, SPSS, Chigago, USA).

Results

The most commonly observed clinical signs in the 34 horses with esophageal obstruction were nasal discharge containing ingesta ($n = 25$), coughing ($n = 17$), gulping ($n = 15$), and excessive salivation ($n = 14$). Other signs less frequently seen were extension of the head and neck ($n = 5$), sweating ($n = 4$), restlessness ($n = 4$), and apathy ($n = 4$).

In 28 cases, the obstruction occurred in the absence of anatomical abnormalities of the esophagus. In 4 horses, the obstruction was caused by megaesophagus (Figure 1); in 1 horse, it was caused by an esophageal stricture in the upper third of the esophagus (Figure 2), and in another horse, it was caused by an esophageal diverticulum.
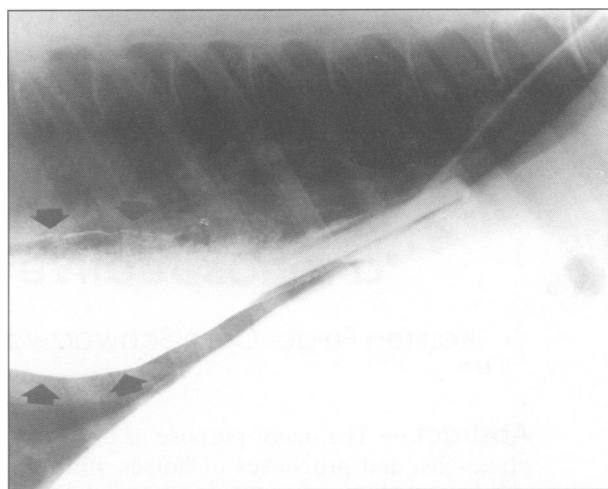

Figure 1. Contrast radiograph of a horse with megaesophagus and recurring esophageal obstruction. The esophagus is markedly dilated (arrows).
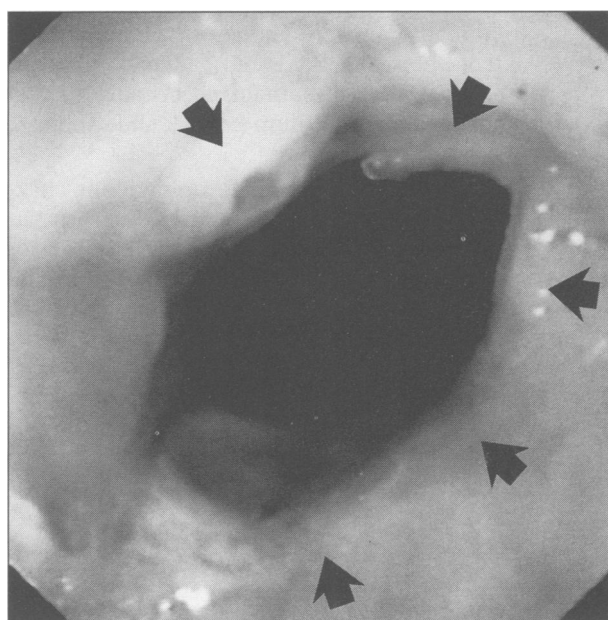

Figure 2. Esophageal stricture (arrows) that developed after esophageal obstruction and resulted in recurring obstruction.

Clinical signs of esophageal obstruction had occurred for the first time in 29 cases but had been recurring for several weeks in 5 cases (Figure 3). In comparison with first-time occurrence, recurring esophageal obstruction was significantly more often associated with a morphological or functional esophageal abnormality ($P < 0.01$, Fisher's exact test). The cause of the impaction was determined in 21 cases. The impaction consisted of pelleted or cubed feed in 9 cases, grass or hay in 5, pieces of carrot in 4, and pieces of apple in 3. Most obstructions were located in the proximal esophagus ($n = 9$) or at the thoracic inlet ($n = 12$). Less often, the obstruction was in the midcervical region ($n = 4$), at the level of the base of the heart ($n = 1$), or just cranial to the cardia ($n = 1$). In the remaining 7 cases the location was not determined.

In 26 cases that underwent endoscopy of the trachea, there was no significant association (Fisher's exact
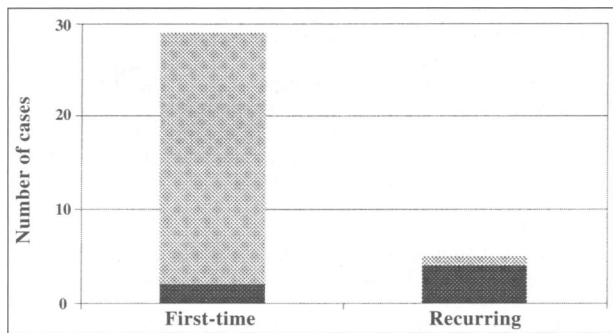
Figure 3. Frequency distribution of first-time and recurring esophageal obstruction. The number of cases with esophageal obstruction due to a functional or morphological esophageal abnormality is shown in black. Recurring esophageal obstruction was significantly more often associated with morphological or functional esophageal abnormality ($P < 0.01$, Fisher's exact test).

test) between the degree of contamination of the trachea and the duration of the obstruction prior to admission (Table 1). Likewise, there was no significant difference (Fisher's exact test) in tracheal contamination among horses that developed aspiration pneumonia and those that did not.

Of the 18 horses that were radiographed, 8 had evidence of aspiration pneumonia. The median duration of illness prior to admission in cases that developed aspiration pneumonia (median 18, range 2–28 h) was significantly longer ($P < 0.05$, t-test) than in horses that did not develop aspiration pneumonia (median 4, range 0.5–48 h).

In 28 cases, the obstruction could be relieved by one esophageal lavage with the horse standing. In 1 case, the impaction resolved spontaneously after unsuccessful esophageal lavage. In 3 cases, a second esophageal lavage was necessary and in 2 cases, general anesthesia was required for successful treatment.

Although all 34 horses were successfully treated, 4 were euthanized because of a history of recurring obstruction due to megaesophagus ($n = 2$), esophageal diverticulum ($n = 1$), or esophageal stricture ($n = 1$), all of which have a grave prognosis. Two horses with a functional esophageal disturbance due to megaesophagus were discharged; however, one was reported as having recurring episodes of dysphagia. Therefore, the prognosis was considered good in horses with simple esophageal obstructions that were first-time occurrences and that had no associated complications.

Discussion

Regurgitation of food through the nostrils is the classical sign of esophageal obstruction, but there are other, less specific clinical signs that occur with varying frequency (1). In this study, nasal discharge containing ingesta was seen in 76% of cases and, thus, was the cardinal symptom. When this clinical sign is accompanied by coughing, gulping, excessive salivation, or extension of the head and neck, a diagnosis of esophageal obstruction is usually warranted.

Our results support previous findings that radiography and endoscopy of the esophagus are generally not

Table 1. Duration of esophageal obstruction prior to admission and severity of tracheal contamination, as determined by endoscopy. There is no significant association between duration of obstruction and severity of contamination (Fisher's exact test)

Severity of tracheal contamination	Duration of esophageal obstruction prior to admission		
	< 6 h	6–12 h	> 12 h
None	3	1	—
Mild	5 (2)	5 (1)	3 (3)
Moderate	5	1(1)	2 (1)
Severe	1	—	—

The numbers in parentheses indicate the number of cases that developed aspiration pneumonia

required for a diagnosis (6). A reason for this is that the majority of esophageal obstructions are not associated with morphological or functional disturbances. However, radiographic examination of the esophagus is indicated in cases with recurring esophageal obstruction, because of the likelihood of a primary esophageal disease (7). This was in agreement with the findings in our study, in which all but 1 case with recurring esophageal obstruction had a functional or morphological abnormality of the esophagus. In such cases, contrast radiography is the preferred diagnostic technique (8,9).

Endoscopy of the esophagus allows for better assessment of the extent and severity of lesions seen on radiographs and should be employed when results of radiography are inconclusive (7,9). However, in 1 case in this study, an esophageal stricture could only be visualized by endoscopy. Therefore, endoscopy and radiography of the esophagus are indicated in every case with recurrent esophageal obstruction. Endoscopy should be done first, because it is more practical, safer, and often very informative.

In contrast to esophageal obstruction due primarily to impaction of ingesta, mechanical stenosis or functional abnormalities of the esophagus have a poor prognosis (6). However, those conditions occur infrequently. In the present study, only 4 cases were given a grave prognosis because of morphological or functional esophageal disease.

Because dysphagia may result in contamination of the trachea with saliva and food (1), aspiration pneumonia should be considered in all cases with esophageal obstruction (2,4,6). Clinical and radiographic examination of the lungs is, therefore, indicated (7). This finding was supported by the results of this study, in which 8 cases developed aspiration pneumonia, confirmed by radiography. The duration of esophageal obstruction prior to admission is a good indicator of aspiration pneumonia, because the risk of aspiration pneumonia increases with an increase in duration of obstruction. Endoscopic evidence of tracheal contamination with food was a poor predictor of subsequent aspiration pneumonia. For these reasons, prophylactic administration of antibiotics is recommended in every case of esophageal obstruction. Penicillin, gentamicin, and metronidazole are considered to be a suitable combination (1). With appropriate treatment, aspiration pneumonia due to esophageal obstruction usually resolves without residual

impairment of lung function (1). In our cases, also, no complications occurred in horses with aspiration pneumonia and all horses fully recovered.

In conclusion, the most common type of esophageal obstruction in horses is simple obstruction due to impaction of ingesta. Diagnosis based on typical clinical signs is usually straightforward, and in most cases, treatment can be successfully performed on the sedated standing animal. Possible complications include the development of aspiration pneumonia. The prognosis is good in horses without morphological or functional abnormalities of the esophagus.

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BOOK REVIEW

COMPTE RENDU DE LIVRE

Rollin BE. *An Introduction to Veterinary Medical Ethics: Theory and Cases.* Ames, Iowa State University Press, 1999, 417 pp. ISBN 0-8138-1659-9.

We all know right from wrong, so why would we need a text or reference book on ethics? Most of us who read *The Canadian Veterinary Journal* will know of some of Dr. Rollin's work from his column, "Veterinary Medical Ethics." His latest book, *An Introduction to Veterinary Medical Ethics: Theory and Cases,* is a valuable expansion on that column. The book is divided into 2 sections: the first on the basics of ethical theory and decision making, the second on case study examples of ethical dilemmas that veterinarians may face in day-to-day practice.

The section on theory is relatively short (75 pages) and is an informative overview of ethical theory. Dr. Rollin examines all the issues of social, personal, and professional ethics in a concise and straightforward manner. He lays the groundwork for a logical evaluation of the ethical problems listed in the second half of the book. Dr. Rollin also offers us a more indepth view of what and how an ethicist examines ethics and ethical behavior. In the subsection entitled The Nature of Ethical Theory, Rollin defines the 2 major groups of ethical theories, consequentialist and deontological. The reading here is slightly heavy and arduous. However, this section is critical to the understanding of the book as a whole and should be understood by the reader before progressing.

Rollin details the 5 moral obligations which veterinarians encounter: obligations to clients, peers, society, self, and our patients. He continues, challenging the reader to think about the interplay among all of these

obligations in situations faced daily by practitioners. Rollin's summary of the demographic changes in North American society, and the effect of these changes on the perception of animals' well-being, leads into his New Ethic for Animals. In this last section of the theory part of the book, Rollin expounds his views on the role that veterinarians and organized veterinary medicine have taken in animal welfare and animal rights. Furthermore, he offers some suggestions as to what the role of veterinarians might or should be. This section is a must read for any veterinarian concerned about animal welfare and for anyone involved in the resolution of conflicts arising from veterinary intervention with animals.

The second section of the book presents case studies of ethical dilemmas, including some suggestions on how to deal with each case. While this is a lengthy collection of varied scenarios, 82 cases in all, every veterinarian can immediately identify numerous cases that have happened to him or her. The interesting part is the ethicist's response, which doesn't give a direct answer. However, it does remind the reader of the many influences that can play a role in the decision making process for the situation outlined.

Overall, this is a well-written, thought-provoking book on a subject that is crucial to our profession. It really should be read by all veterinary students, practitioners, and those interested in animal welfare in general.

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