Parotid duct laceration repair in two horses

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ABSTRACT

Repair of parotid duct lacerations in 2 horses is described using intraluminal silastic tubing as a stent. The duct was lacerated traumatically at the facial vessel notch (incisura vasorum facialis) in the 1st horse, and iatrogenically after removal of an intraluminal sialolith after development of infection within the duct in the 2nd horse. In both cases, a silastic tube was passed retrograde into the duct via the salivary papilla, past the wound until the end lay rostroventrally on the facial vessel notch. The severed salivary ducts and the wounds were sutured. The external portion of the silastic tube was sutured to the skin and the tube left in place. Recovery in the 1st case was uneventful. In the 2nd case a salivary duct/cutaneous fistula formed at a wound distant from the sutured wound, which healed spontaneously. This technique differs from a similar described technique in that the stent tube exits the oral cavity and is attached to the outer skin surface.

Key words: ductoraphy, equine, laceration, parotid duct, salivary-cutaneous fistula.


INTRODUCTION

The parotid duct of the horse is formed by the convergence of numerous large ductules at the rostroventral border of the parotid gland. From here the duct runs rostrally on the medial surface of the mandible and accompanied by the facial artery and vein moves laterally at the facial vessel notch (incisura vasorum facialis). The duct continues dorsally on the rostral border of the masseter muscle, penetrates the buccinator muscle and opens at the parotid papilla, level with the buccal surface of the 4th maxillary premolar.\(^3,5,8\) Owing to its superficial location, the parotid duct is prone to laceration, blunt trauma and iatrogenic injuries.\(^6\)

Newton et al.\(^7\) described a surgical technique where the lacerated duct was sutured over a dog urinary catheter that acted as a stent. This catheter exited at the papillary duct inside the mouth. In a case where the ductal defect was 15 cm long, Kannegieter and Ecke\(^8\) performed a successful interpositional tube graft using polytetrafluoroethylene tubing.

Salivary flow may also be restored by a translocation technique, whereby the proximal portion of the duct caudal to the wound site is catheterised, leaving the rostral tip of the catheter to exit into the buccal lumen through a stab incision into the oral cavity.\(^9\) The outer wound is then sutured or allowed to granulate by 2nd intention.

Chronic salivary duct fistulae have also been treated by ligation of the duct\(^10\), surgical removal\(^11\) or chemical ablation\(^12\) of the parotid gland. Spontaneous closure of the fistula may occur if treatment is deferred.\(^13\)

The technique described in this paper allows re-anastomosis of the parotid duct over a temporary intraluminal silastic tube, which results in normal secretion of saliva at the parotid papilla, with minimal disruption of normal anatomical architecture.

CASE HISTORIES

Case 1

A 15-year-old Thoroughbred mare was presented to the Equine Clinic, Onderstepoort, with a vertical 6 cm-long laceration, approximately 1 cm deep, at the ventrolateral border of the right mandible, approximately 2 cm caudal to the facial vessel notch. Prior to admission, profuse haemorrhage was controlled by the referring clinician by means of a pressure bandage. Clinical examination revealed no obvious injury to adjacent structures and the horse was discharged 3 days later, after treatment as an open wound. Three days later a clear fluid dripped from the wound when the horse was presented with food. The horse was re-admitted to the clinic and a diagnosis of parotid salivary duct/cutaneous fistula was made.

To establish the location of the rostral opening of the proximal duct segment, salivation was stimulated by presenting the horse with food.\(^14\) A FG 5 silastic infant feeding tube (Viking) was inserted retrograde into the aperture. The tube was left in place. The duct’s distal aperture could not be found in the granulation tissue. A decision to catheterise the distal duct and attempt sialoductoraphy under general anaesthesia was made.

The horse was administered 6 × 10^4 IU procaine benzylpenicillin (Depocillin, Intervet) intramuscularly prior to surgery and was premedicated with 0.5 m/ 1 % propionyl promazine (Combelen, Bayer, AH) intramuscularly. Anaesthesia was induced with 25 g glyceryl guaiacol ether (GGE Powder Kyron, Kyron) and 1 g thiopentone sodium (Intraval sodium, Rhône-Poulenc) intravenously. Inhalation anaesthesia was maintained using 2 % halothane (Fluothane, Zeneca) and oxygen.

The horse was positioned in left lateral recumbency and the right cheek area was surgically prepared. The parotid papilla was located by means of a buccotomy directly over the centre of the 4th maxillary premolar. A 2 nd skin incision was made 2 cm rostral to the buccotomy site. The tip of the FG 5 silastic infant feeding tube was inserted at this skin incision and advanced subcutaneously to the buccotomy site and passed into the parotid papilla opening by visual observation through the buccotomy site. The feeding tube was passed retrograde into the rostral portion of the severed parotid duct. The tip of the tube emerged from the wound site.

The parotid duct had been only partially severed laterally. The silastic tube’s tip was advanced retrograde into the proximal duct segment approximately to the rostral border of the parotid gland. Excessive granulation tissue was Surgi-
cally removed until the lacerated edges of the duct could be clearly identified. The lacerated duct was closed over the silastic tubing using single interrupted sutures of 6/0 polydioxanone (PDS, Ethicon). Routine wound closures were performed at the various sites. The external portion of the feeding tube was sutured to the skin (Fig. 1).

Following recovery, the horse was given flunixin meglumine (Finadyne, Centaur) intravenously, and $6 \times 10^6$ IU procaine benzylpenicillin (Depocillin, Intervet) intramuscularly daily for 3 days post-operatively. When presented with food, saliva flowed from the external tube opening (Fig. 2). To prevent the horse from prematurely pulling the feeding tube out, a tube gauze was applied over her head.

The horse was discharged from the clinic 2 days post-operatively. The owner was advised that the tube should stay in place for 6 weeks. Four weeks post-operatively the horse pulled the tube out and was re-admitted. Clinical evaluation showed no abnormalities and the horse was discharged. Seven months post-operatively, the owner reported that the horse appeared to have no salivary duct problems.

**Case 2**

An 11-year-old Thoroughbred gelding was presented to the clinic with a history of an intermandibular swelling and mild icterus. The referring clinician had suspected an abscess, possibly involving a mandibular tooth. The teeth had been floated and purulent material had been found on the float and in the mouth. No abnormal haematological parameters had been found. The horse had been given physiotherapy and was treated with antibiotics and non-steroidal anti-inflammatory drugs. However, the swelling had not responded to treatment and had enlarged considerably in 5 days. On examination, the horse had a temperature of 38.9°C, had difficulty masticating and showed pain on palpation of the swelling. The swelling extended from the right ramus of the mandible. It was hard and could be moved back and forth in a rostro-caudal plane. An incision was made over the right retromandibular area to rostral to the right masseter muscle. It filled the intermandibular space and was palpable lateral and ventral to the right horizontal mandibular ramus. The retromandibular portion of the mass had a few palpably fluctuant areas. Fine-needle aspirate of these areas yielded pink, purulent material. Clinical pathological results revealed only a mild hyperglobulinaemia (61.1 g/l).

A diagnosis of inter- and retromandibular abscessation of unknown aetiology was made. Radiographs revealed increased density of the peri-mandibular soft tissues and radiolucent areas indicative of gas in the abscess area. The abscess was lanced at 2 dependent sites, drained and lavaged with copious amounts of tap water. This lavage was repeated daily until discharge. The horse was treated with $6 \times 10^6$ IU procaine benzylpenicillin (Depocillin, Intervet) intramuscularly b.i.d. and 1 g of phenylbutazone (Equi-palazone, Kyron) orally every 24 h. At discharge the swelling had nearly resolved. A 7-day course of oral potentiated sulfonamides (Purbac, Lennon Medicines) at 15 mg/kg b.i.d. was prescribed and the owner advised to ensure that the lanced openings were kept patent by daily cleaning of the wounds. The wounds healed uneventfully.

Approximately 2 months later, a swelling was evident on the right lateral ramus of the mandible. It was hard and could be moved back and forth in a rostro-caudal plane. An incision was made over the mass at the extreme rostral aspect of the masseter muscle at the level of the occlusive surface of the cheek teeth. A white ovoid mass approximately $2 \times 2 \times 1.5$ cm was removed. The wound was left open. When the horse was presented with food, saliva flowed from the incision site. A salivary duct fistula was diagnosed.

Laboratory analysis described the material as consisting of typical calculus tissue with protein-rich homogenous matrix and calcified stromal tissue, consistent with the diagnosis of a sialolith.

The horse was re-admitted to the Equine Clinic and anaesthetised using a similar regime to that described for Case 1 and a sialoductory was performed. The horse was positioned in left lateral recumbency and the right cheek surgically prepared. The distal severed duct opening in the wound was isolated and the rounded tip of a length of 2 nylon suture material (Ethilon, Ethicon) was passed rostrally, until it emerged from the papillary duct. A 15 G needle was placed from the skin surface through the cheek immediately rostral to the papillary duct opening into the buccal cavity. The tip of a FG 5 sialastic infant feeding tube (Viking) was inserted through the needle into the buccal cavity. The nylon emerging from the papillary duct was threaded into the feeding tube and the feeding tube then guided over the nylon, threaded retrograde through the papillary duct opening until it exited from the wound. The feeding tube was then placed into the caudal

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**Fig. 1:** Silastic stent tubing in place within parotid duct, exiting from separate skin incision and sutured to skin.
duct opening at the wound and threaded retrograde until the tip rested at the ventral aspect of the parotid gland. The nylon and 15 G needle were then removed. Ductoraphy over the tubing was performed using single interrupted 5/0 polydioxanone sutures. Routine wound closure was performed. The external portion of the feeding tube was sutured to the skin.

Post-operatively the horse was given $6 \times 10^6$ IU procaine benzylpenicillin (Depocillin, Intervet) intramuscularly every 24 h for 3 days. When presented with food, saliva flowed from the external tube opening. To prevent the horse from prematurely pulling the feeding tube out, a tube gauze was applied over his head and attached behind the ears.

The horse was discharged from the clinic 4 days post-operatively. He was re-admitted 10 days later with a complaint that a clear fluid was leaking from one of the abscess lance wounds when the horse was presented with food. Contrast radiography of the wound revealed only a short dorsally-directed fistulous tract. This tract was left open and healed with no salivary leakage after 3 months of conservative treatment. Full recovery was reported 1 year post-operatively.

**DISCUSSION**

In both cases, the lacerated ends of the parotid duct could be brought in apposition and re-anastomosed. An indwelling silastic stent catheter was necessary to allow normal flow of saliva without stressing the anastomosed site and to prevent stricture of the duct lumen prior to healing. The minimum time period that the stent tube should be left in place has not been determined. The horse in Case 1 pulled the tube out 4 weeks post-operatively with no apparent adverse effects. Reports in the literature do not indicate the healing time of the equine parotid duct. In both cases, however, the stent tube was removed by the patients prior to re-examination.

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**REFERENCES**

2. Bracegirdle JR 1976 Removal of the parotid
and mandibular salivary glands from a pony mare. The Veterinary Record 98: 507.


Book review — Boekresensie

Contamination of animal products: prevention and risks for public health

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This volume, 16(2) of the Scientific and Technical Reviews of the OIE, is a remarkable achievement by its 2 coordinators and 105 authors. It is a stimulating contribution to modern veterinary science. It highlights the need for continuous adjustments to conventional animal services in the production, harvesting, trading, safety and wholesomeness of animal-derived foods for human consumption, and promotes a global perspective of the vital importance of safe food of animal origin and efforts to prevent biological and non-biological (physical, chemical) pathogenic agents from reaching the consumer. Changes in international trading rules related to food safety assurance are explained. These place pressure on developed and developing countries alike to review and revise their existing approaches to sanitary/phytosanitary food standards to avoid conflict with international trade agreements and maintain credibility with consumers and the food industry. Finally, it underlines the growing importance of veterinary public health and veterinary epidemiology to risk assessment, risk management, risk communication and to international and regional trade in livestock products.

The preface emphasises that this book is devoted to the examination of hazards that consumption and use of animal products pose to human health. Food safety hazards related to products of domestic (traditional) livestock and non-domestic (non-traditional, aquatic and game) species are explored. The book refers to risk assessment, management and communication, and generally reflects an international perspective on food safety issues. By directing attention to the very close link between animal and human diseases, it emphasises the equally close links between environmental, animal and human health.

Detailed data on the broad aspects mentioned above are reviewed in 40 papers (36 in English, 1 in Spanish and 3 in French, each with an informative summary in each of the 3 languages), 31 graphs, 13 diagrams, 94 tables and 3 coloured illustrations. The information is presented in 10 groups of reports on the following subjects:

Introduction to public health risks from food and products of animal origin: 4 reports on Codex Alimentarius food quality and safety standards for international trade; risk and the food-safety chain from the point of view of animal health, public health and the environment; the role of epidemiology in public health and longterm sequelae to foodborne disease.

Concepts for prevention of public health risks: 2 reports on hazard analysis and critical control-point systems in the United States Department of Agriculture regulatory policy, and hazard analysis and critical control-point systems applied to public health risks from the point of view of sea food.

Beef: 6 reports reviewing risks and prevention of contamination of feedlot cattle; hygienic conditions of beef production; Escherichia coli 0157:H7 in beef; risks and prevention of contamination of beef carcasses during slaughtering; possible microbiological hazards and risks associated with meat from dairy cows.

Meat from small ruminants: 3 reports on public health hazards in Europe, Australia and the Caribbean.

Milk and dairy products: 4 reports on the history and progress of milk pasteurisation and safety; pathogenic microorganisms, risks and prevention of contamination in milk and dairy products; public health and safety of milk and milk products from sheep and goats.

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