Dental Quiz

Delayed post-operative bleeding in the Greyhound
By Rachel Perry

26th European Veterinary Dental Forum
Congress report

27th EVDF Innsbruck
Call for papers
Save the Date!
31st May to 2nd June 2018
Contents

3 Dentistry Diary
4 27th EVDF: Call for papers
11 Congress Report 26th EVDF

14 EVDS News: Information for members

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Dental quiz
By Rachel Perry
## 2017

<table>
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<th>Date</th>
<th>Event</th>
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<th>More info</th>
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<tbody>
<tr>
<td>15th August</td>
<td>Deadline Call for papers 27th European Veterinary Forum</td>
<td>&gt;&gt;Innsbruck, Austria</td>
<td><a href="#">link</a></td>
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<td>14-17 September</td>
<td>Veterinary Dental Forum</td>
<td>&gt;&gt;Nashville, USA</td>
<td><a href="http://www.veterinarydentalforum.org">http://www.veterinarydentalforum.org</a></td>
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<td>14-16 December</td>
<td>Orthodontics</td>
<td>&gt;&gt;Halmstad, Sweden</td>
<td><a href="http://www.accesia.se">http://www.accesia.se</a></td>
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## 2018

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<tr>
<td>15-18 November</td>
<td>32nd Annual Veterinary Dental Forum</td>
<td>&gt;&gt;Phoenix, USA</td>
<td><a href="http://www.veterinarydentalforum.com">http://www.veterinarydentalforum.com</a></td>
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For more information and updates [http://www.evds.org/](http://www.evds.org/)
The European Veterinary Dental Society and the European Veterinary Dental College welcome proposals for papers to be presented at the 27th European Veterinary Dental Forum, to be held in Innsbruck, Austria, 31st May to 2nd June 2018.

Papers within all fields relating to veterinary dentistry, including small animal, equine and exotic dentistry, will be considered for presentation. German speaking presenters willing to contribute with presentations in the German language may do so, because this year there will be a German stream. All proposals must be, however, submitted in English language. Either 10, 25 or 50 minutes speaking time (including 5 minutes’ time for discussion) will be allowed for review lectures, original clinical studies, and original research studies. 10 minutes speaking time will be allowed for brief case reports. Decisions on the lecture schedule, however, will be made by the scientific programme committee. Posters are also welcome. The best poster will be rewarded with a prize. Oral and poster presenting authors of accepted papers benefit from a special rate of registration. However, all expenses (travel, hotel, etc.) associated with the submission and presentation of a paper are under the exclusive responsibility of the presenter. Please note that the first author should be the paper presenter by default.

Papers may be submitted online only. Papers sent by fax or email will not be accepted. The scientific programme committee has decided to implement a no-show policy. Therefore, submission of a paper constitutes a formal commitment by the author(s) to present the work if accepted. Failure to present and register for the congress, if not properly justified, will be considered as no-show and will jeopardize the acceptance of papers in future congresses. In addition, papers considered as no-show will be removed from all congress publications.

**IMPORTANT DATES**

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<tr>
<td>15th August 2017</td>
<td>Call for papers closes</td>
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<td>1st October 2017</td>
<td>Notification of acceptance/rejection</td>
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<tr>
<td>28th February 2018</td>
<td>Early registration – Presenting authors must register mandatorily by this date</td>
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**Congress committee:** Henriëtte Booij-Vrieling, Lisa Mestrinho, Yves Debosschere, Jerzy Gawor and Nicole du Toit. Scientific programme committee: Alexander Reiter (USA), Jerzy Gawor (Poland), Nicole du Toit (South Africa), Henriëtte Booij-Vrieling (The Netherlands) and Lisa Mestrinho (Portugal). Local organizing committee: Matthias Seewald, Nina Spyra, Corinna Hauser.
An 11 year old neutered male retired racing Greyhound is presented to you for surgical repair of an oro-nasal fistula (ONF) at the level of a missing right maxillary canine tooth (104). This tooth was extracted 6 months previously due to advanced periodontitis, along with the first and second pre-molar teeth (105 and 106). The ONF then quickly became clinically apparent. One further surgical attempt at repair had been performed 8 weeks prior to presentation. The dog is otherwise fit and well, and has no other reported health issues. Physical examination was otherwise unremarkable and vital signs were within normal limits. Pre-anaesthetic blood tests including biochemistry values and a manual PCV were within normal limits for the breed.

The patient was pre-medicated with methadone (0.2mg/kg) and anaesthetised with midazolam and propofol, and maintained under isoflurane delivered in oxygen. Under regional anaesthesia with bupivacaine, a single layer buccal mucosal advancement flap was created to repair the fistula. Bleeding from inflamed turbinates was noted during surgery but had ceased by the end of the procedure. Meloxicam injection was given during recovery, which was swift and uneventful. Opioid analgesia was continued during overnight hospitalisation, along with intravenous paracetamol. Mild bilateral epistaxis was noted overnight, but had ceased by the morning, and the patient was discharged with meloxicam and tramadol to take per os. Two days later the patient presents with copious bleeding from, and swelling of the surgical site, with blood coming from the nose and mouth. This is unresponsive to the application of cold packs. The sutures are intact, and there are no signs of bleeding elsewhere in the body. Routine haematological values including a manual platelet count, OSPT and aPTT tests are all within normal limits. What therapy would be most appropriate in this situation?

- a) Stopping administration of the NSAID
- b) General anaesthesia to explore the surgical site
- c) Tranexamic acid given IV as a bolus and then CRI
- d) Vitamin K injection SC
- e) Blood typing and whole blood transfusion

The correct answer is C.
Delayed post-operative bleeding in the Greyhound

Rachel Perry
BSc, BVM&S, MANZCVS, DipLEVDC, MRCVS
European Veterinary Specialist, Veterinary Dentistry
RCVS Recognised Specialist, Veterinary Dentistry

Haemostasis is a physiological phenomenon designed to maintain circulatory capacity in the face of blood vessel damage and haemorrhage. A sound understanding of normal haemostasis and its aberrations is vital for the oral surgeon. There are two distinct but overlapping phases, termed primary and secondary haemostasis, that culminate in the formation of a thrombus (clot) to seal the damaged vasculature. Upon damage to the vascular endothelium, the initial response is vasoconstriction to limit blood supply to the damaged area. Primary haemostasis is also triggered, which relies upon an adequate number of normally functioning platelets. These cells adhere to exposed sub-endothelial collagen either directly or via collagen-bound von Willebrand factor (vWF) and become activated, attracting and facilitating the aggregation of further platelets to form a platelet plug. Secondary haemostasis (which is triggered concomitantly with primary haemostasis) produces fibrin via activated coagulation factors, which serves to stabilise and strengthen the platelet plug. This coagulation cascade has traditionally been thought of as intrinsic and extrinsic pathways, which join the common pathway to produce thrombin. Considering a cell-based model of coagulation however more accurately reflects coagulation in vivo. ¹ Coagulation is initiated on tissue-factor bearing cells (e.g. fibroblasts), amplified and propagated on platelets. Thrombin cleaves fibrinogen to fibrin and also strengthens the clot by activating factor XII, cross-linking the fibrin. There clearly exists a fine balance of producing exactly the right volume of thrombus in the right place, at the right time for an adequate length of time until healing has occurred. Fibrinolysis helps achieve this self-regulation by dissolving fibrin into soluble degradation products (fibrin degradation products; FDPs) via the action of plasmin, thus breaking down the thrombus. Fibrinolysis and coagulation are mutually incompatible; activation of one will suppress the latter. ¹ Hyperfibrinolysis describes a situation where fibrinolytic activity is greater than fibrin formation so that clot integrity is compromised.

Haemostatic testing
The results of any haemostatic testing should be interpreted carefully, and in light of any clinical signs.

I. Primary haemostasis
a. Platelet count
This detects quantitative platelet defects (thrombocytopenia). Platelet aggregation may cause pseudothrombocytopenia as an artefact via an automated cell counter, so a manual count must always verify a low automated platelet count. The average number of platelets seen per high power field is then multiplied by 15000 to give an accurate platelet count.

b. Buccal mucosal bleed time
This simple qualitative test reflects primary in vivo haemostasis. A normal bleeding time in the dog is <4 minutes, and will be prolonged with thrombocytopenia and thrombopathies, such as vonWillebrand disease.¹
2. Secondary haemostasis
a. Prothrombin time (PT) and Activated Partial Thromboplastin Time (aPTT)
Prolongation of the PT indicates defective extrinsic and/or common pathways, while a prolonged aPTT signifies defective intrinsic and/or common pathways. Point-of-care coagulometers are now available, and used in many veterinary clinics. The results should always be interpreted with caution; marked prolongations are usually clinically significant, but mild prolongations should be interpreted with caution.

b. Thrombin clot time (TCT)/ Fibrinogen
Clotting assays such as aPTT and PT assess the formation of a fibrin clot, but are usually not decreased until fibrinogen levels themselves are significantly decreased. This is measured using the thrombin clot time (TCT) and is prolonged with hypofibrinogenaemia or in the presence of factors which inhibit fibrin polymerisation (e.g.fibrin split products).

3. Fibrinolysis
a. Fibrin Split Products (FDPs)
These are generated upon lysis of fibrinogen, soluble fibrin or cross-linked fibrin, so that elevated concentrations suggest increased fibrinolysis/fibrinogenolysis via the activation of plasmin. They are commonly encountered in disseminated intravascular coagulation (DIC), thromboembolism, neoplasia, sepsis and systemic inflammatory response syndrome (SIRS), heatstroke, trauma, gastric dilatation volvulus and heart failure.

b. D-Dimers
Production of D-Dimers indicates the activation of plasmin and thrombin and thus active coagulation and fibrinolysis. Several assays have been validated for use in the dog, and are a sensitive indicator of DIC and thromboembolism. However, levels will also be raised following any surgical procedure.

4. Hemostasis as a whole
a. Thromboelastography (TEG)
TEG analyses the entire process of haemostasis from inception of coagulation to fibrinolysis. The strength of the clot can be assessed, as well the dynamics of production and breakdown. It is therefore an accurate predictor of in vivo haemostasis and fibrinolysis. The use of TEG has shown that Greyhounds have clots that are slower to form and weaker than non-Greyhound dogs. ²

The idiosyncratic Greyhound
Greyhounds have been selected and bred for speed over many centuries, which may in part explain some of their biochemical and haematological idiosyncrasies. ³-⁶ Packed cell volume (PCV) is often higher, white cell and platelet counts are often lower and blood urea nitrogen and creatinine values may be higher than other breeds of dog. Anecdotal references to Greyhounds’ propensity for post-operative bleeding after procedures such as gonadectomy, laparotomy and limb amputation are well documented on Greyhound websites (so-called ‘Greyhound bleeders’).
Delayed post-operative bleeding in the Greyhound

Rachel Perry
BSc, BVM&S, MANZCVS, Dipl.EVDC, MRCVS

In 2008, Lara-García et al studied this phenomenon in eighty-eight dogs presented for ovariohysterectomy (N= 52) or castration (N= 36). In total, 26% (23/88) had delayed post-operative bleeding 36-48 hours after surgery. The bleeding was self-limiting in all, and none of the dogs required a transfusion. Pre-operative testing was not shown to differ between those dogs that bled or did not bleed post-operatively (platelet count and function, PCV, OSPT, aPTT, vWF and D-Dimers). Concentration of D-Dimers was significantly raised after surgery in both groups. In 10% of the dogs that bled there was a decrease in PCV of >6% but blood therapy was not required. The data did not support a defect in either primary or secondary haemostasis in the dogs that bled. Instead, the authors hypothesised that enhanced fibrinolysis may have therefore been responsible.

A retrospective study of the prevalence of post-operative bleeding in retired racing Greyhounds undergoing limb amputation for appendicular bone tumours has also been studied. Thirteen of 46 dogs (28%) developed delayed post-operative bleeding, starting 48-72 hours after surgery. In addition, the benefit of pre-emptive post-operative use of epsilon-aminocaproic acid (EACA) to prevent bleeding was assessed. EACA is a potent inhibitor of fibrinolysis by preventing formation of plasmin on the fibrin clot. In this study, the dogs that received EACA were nearly 6 times less likely to bleed post-operatively than those that did not. A prospective study has also shown EACA to be effective in preventing post-operative bleeding after neutering.

Anti-fibrinolytic drugs are often used in human medicine to control haemorrhage in many clinical situations including; EACA, tranexamic acid (TA) and aprotinin. TA and EACA are lysine analogues, and decrease fibrinolysis by inhibiting plasminogen and increasing antiplasmin. Aprotinin is prohibitively expensive compared and shows no improved clinical efficacy compared to EACA and TA. If clinical bleeding can be attributed to hyperfibrinolysis then anti-fibrinolytic drugs are appropriate. Their use in human medicine is documented in cardiovascular, paediatric and orthopaedic surgery, severe menstrual and post-partum bleeding and trauma cases. TA has been shown to be safe in healthy dogs IV as a slow IV bolus at 10 mg/kg, followed by a 3 hour CRI at 10ml/kg/h and is anecdotally reported to be used in veterinary hospitals for a variety of bleeding conditions, including delayed post-operative bleeding. Hyperfibrinolysis was the presumptive diagnosis in this case given the timing of onset of clinical signs, and normal results of haematological and coagulation tests performed. Further tests of fibrinolysis were not available at the time of emergency presentation, and thus TA was started intravenously. Bleeding rapidly subsided and the dog was able to be discharged home the following day, with TA tablets to be taken orally. No further bleeding episodes were reported, and the oronasal fistula repair healed without further complication. This case highlights an unexpected but dramatic post-operative complication in a retired racing Greyhound presented for oral surgery. Knowledge of delayed post-operative bleeding due to hyperfibrinolysis in this breed enable prompt and effective treatment.
Delayed post-operative bleeding in the Greyhound
Rachel Perry
BSc, BVM&S, MANZCVS, Dipl.EVDC, MRCVS

References

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Continuing Education with a Bite:
Report of the 26th European Veterinary Dental Forum in Malaga, Spain

423 delegates from 38 countries gathered in Malaga, Spain, between May 18th to 20th, 2017 to catch up with friends and colleagues, and to meet inspiring speakers and experts at the 26th European Veterinary Dental Forum. 27 exhibitors and sponsors highlighted their services at this congress and provided an excellent commercial exhibition. The participants enjoyed a large exhibit hall with various booth exhibitors displaying products and equipment with direct application to veterinary dentistry.

The Europeans’ largest and most influential veterinary dental event was organised by the European Veterinary Dental Society (EVDS) together with the European Veterinary Dental College (EVDC) and the Spanish Veterinary Dental Society (SEOVE). The Local Organizing Committee, presided by Jesús María Fernández Sánchez, offered a remarkable social program, featuring an exclusive welcome reception with 4500 (!) tapas at the Kaleido Port Restaurant, a famous and prestigious traditional Spanish horse and flamenco show at El Ranchito and the EVDS Gala Dinner with excellent Spanish wine and food at Torremolinos Congress Palace.

The European Veterinary Dental Forum commenced with the EVDC Training Day, which this year was held at the local Veterinary Specialist & Referral Centre. The training sessions could only take place with the extremely generous support of our equipment sponsors Accesia, Acteon, iM3, Kruuse, Midmark and Equine Blades Direct Ltd.

6 half-day wetlabs covered Surgical Dental Extractions in Dogs, Feline Dental Extractions, Periodontal Surgery, Management of Linguoversion of the Mandibular Canine Teeth, Restorative Techniques and Rostral Mandibulectomy and Maxillectomy. Two half-day wetlabs in Equine Dentistry covered the topics Equine Periodontal Disease and Equine Dental Imaging. A full training day focused on Equine Dental Extractions. All wetlabs were tutored by Diplomates of the EVDC and AVDC.

The scientific program included many hours of lecture sessions with small animal dentistry essentials as well as intermediate and advanced level presentations. Keynote Speaker Fidel San Roman Ascaso, Full Professor of Surgery at the Faculty of Veterinary Medicine of Complutense University of Madrid, gave an overview of New Advances in Oral and Maxillofacial Surgery in Small Animals. A lecture stream in equine dentistry was also presented and proved very popular. With our best thanks to Acteon, who provided USB sticks for all participants, EVDF became more green: the first digital issue of the EVDF Book of Proceedings premiered in Malaga.
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J Med Microbiol June 2004 vol. 53 no. 6 p495-500
The alleviation of oral candidiasis by LF feeding in this model may correlate with the enhancement of the number of leukocytes and their cytokine responses in regional lymph nodes against Candida infection.

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Lactoferrin promoted fibroblast-mediated collagen gel contraction. These observations indicate that lactoferrin supports multiple biological processes involved in wound healing.

Bovine Lactoferrin and Piraxicam as an Adjunct treatment for Lymphocytic-Plasmacytic Gingivitis Stomatitis in Cats.
the Veterinary Journal 202(2014) 76-82.
CONCLUSION : “It was concluded that combining oral LF spray (Oral-Relax®) and piroxicam was safe and might be used to decrease the clinical signs of caudal stomatitis in cats.”

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Report of the 26th European Veterinary Dental Forum

This year the EVDF Scientific Committee could again provide more room for hands-on lectures with a smaller and highly interactive audience. Tobias Schwarz held a Special Interactive Session which focused on Small Animal Masticatory, Oral and Dental CT & MRI. Further interactive sessions covered the topics Interpretation of Dental Radiographs, Oral Tumors, Cysts and Fistulas in Small Animal Veterinary Practice, Dental Case Scenarios in Day-to-Day Practice, VOHC Scoring Update, Dentistry in Ferrets, Rabbits and Rodents and Orthodontics Case Discussion.

The European Veterinary Dental Society wishes to thank all our sponsors for supporting the European Veterinary Dental Forum, which included Diamond Sponsor Hill’s Pet Nutrition, Long Term Parter Royal Canin, Gold Sponsor IM3, Silver Sponsors Accesia, Acteon Satelec, Kruuse, Mars Petcare, Midmark, Planmeca Group, Virbac, Bronze Sponsors AllAccem, Buccosanté Swedencare, Eickemeyer, Keystone, Mai Animal Health, Sanos, and Exhibitors Arguser, Dearson Veterinary Products, EcuPhar, Equinvest, Horse Dental Equipment, Kavo Kerr, Suni Medical, Vetdicate and VIN News Service.

Once again, the congress attendance of 20 young graduates of veterinary medicine was sponsored by Royal Canin. Mars Petcare extended an invitation to the Young Graduates Dinner at beautiful Chiringuito Pedro Gutierrez Restaurant at Malaga beach.

The traditional Gala Dinner at Torremolinos Congress Palace was kindly sponsored by Hill’s Pet Nutrition and IM3. Before the venue was turned into a huge dance floor with inciting live music, the President of the European Veterinary Dental College Jens Ruhnau introduced the new Diplomates of the College Rachel Perry (all species), Manfred Stoll (equine) and Sam Hole (equine). Celebrating the 25th anniversary of the foundation of the EVDS, three EVDS members were lucky to win a free congress registration for the next European Veterinary Dental Congress in Innsbruck, Austria which will be held May 31st to June 2nd, 2018.

The following individuals will serve the European Veterinary Dental Society in the coming year: President Ines Ott, President Elect Henriette Booij-Vrieling, Secretary Katja Riedel, Treasurer Peter Haseler, Past President Lisa Mestrinho, Congress Manager Yves Deboschere.

We want to thank the speakers, tutors, the local organising committee, the sponsors and last but not least our members and participants for their generous and committed support, their continuing collaboration and invaluable contributions that make the European Veterinary Dental Forum what it is: the Europeans’ largest and most influential event to promote and advance veterinary dentistry.

See you in Innsbruck!

Katja Riedel
Secretary EVDS
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1. Find your EVDS membership number
   Log into your account at www.evds.org. Choose the folder „Membership“ and select „My Account Info“. Your membership number will be displayed at the top of the page.

2. Set up your EVDS members JVD online access
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Once the confirmation is received please click the link back to SAGE Journals, click the “Sign in” and enter your email and password. Once logged in you’ll see your name at the top. Go to “My Account” and click on “Society Member Access” then select the society name in the drop down, enter your membership number then click “Activate” (screenshot below). Click “My Content” were you’ll see the journals you have access to.
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