

AVSTS Research Cooperative (ARC) application form

Project title:

Outcome and prognosis of dogs treated surgically for spontaneous pneumothorax caused by pulmonary blebs and bullae

Name and work address of provisional first author: *must be AVSTS member*

Guillaume Chanoit
School of Veterinary Sciences & Langford Veterinary Services
University of Bristol
Langford House
BS40 5DU
Langford-Bristol
Phone : +44 117 331 9001(direct line)

Name(s) of provisional co-authors: *do not need to be AVSTS members.*

Aim(s) of study: *Please identify the key question you hope to answer (in red), along with any secondary aims*

- Determine the outcome of dogs operated upon for spontaneous pneumothorax due to blebs and bullae
- Determine the recurrence rate of pneumothorax after initial surgical treatment from data collected on a large cohort of patients from several institutions.
- Identify potential risk factors for recurrence (see infra)
- Determine the outcome of dogs presented with a recurrence of spontaneous pneumothorax following an initial surgical intervention.

What is known already, and what will this study add? *This should be written in the style of the intended Introduction for the published paper resulting from this work, and should include a full reference list, with PDFs of all references to be attached to this application*

Spontaneous pneumothorax is defined as a closed pneumothorax in which the lung parenchyma is the source of air leakage.¹ The main source of air leakage is the presence of bullae (within the lung parenchyma) or blebs (under the visceral pleura). Breed predispositions (e.g. Siberian huskies) have been identified. Surgery has been advocated as the treatment of choice of spontaneous pneumothorax due to ruptured or leaking bullae or blebs in dogs. Open and thoracoscopic approaches have been described.²⁻⁴ A recurrence rate of 0 to 17% of surgically treated cases is reported.^{2,3,5,6} Information in the literature on outcome of dogs following recurrence of pneumothorax after surgical treatment is relatively scant. In 2 retrospective studies in which recurrence has been either suspected or identified on three dogs,^{2,3} all have been euthanized without any further work up.

Finally, risk factors for recurrence of spontaneous pneumothorax are currently unknown. We propose to look for four predefined risk factors working on the following four hypotheses:

1. Dogs who have documented retrospective evidence of lesions in lung lobes that were NOT operated upon at the original surgery (i.e. as well as the primary, leaking lesion, which was operated upon and removed) have a higher likelihood of recurrence of pneumothorax than dogs with records showing all affected lung lobes were treated surgically.
2. Dogs with lesions documented in more than one lobe have a higher likelihood of recurrence of pneumothorax than dogs with lesions recorded in only one lobe
3. Increasing dog weight is associated with increased risk of recurrence of pneumothorax
4. Dogs with lesion(s) in lobe(s) other than the left or right cranial lung lobes at the time of the first surgery are more likely to undergo recurrence of spontaneous pneumothorax than dogs with lesion(s) in the cranial lung lobe(s).

Our last working hypothesis is that that recurrence of pneumothorax after initial surgical treatment does not necessarily carry a grave prognosis and that further treatment will result in a successful outcome.

A large multi institutional study is therefore necessary to answer these questions

References

- 1.Pawloski DR, Broaddus KD. Pneumothorax: a review. *J Am Anim Hosp Assoc* 2010;46:385-397.
- 2.Holtsinger RH, Beale BS, Bellah JR, et al. Spontaneous pneumothorax in the dog: a retrospective analysis of 21 cases. *J Am Anim Hosp Assoc* 1993;29:195-210.
- 3.Puerto DA, Brockman DJ, Lindquist C, et al. Surgical and nonsurgical management of and selected risk factors for spontaneous pneumothorax in dogs: 64 cases (1986-1999). *J Am Vet Med Assoc* 2002;220:1670-1674.
- 4.Brissot HN, Dupre GP, Bouvy BM, et al. Thoracoscopic treatment of bullous emphysema in 3 dogs. *Vet Surg* 2003;32:524-529.
- 5.Lipscomb VJ, Hardie RJ, Dubielzig RR. Spontaneous pneumothorax caused by pulmonary blebs and bullae in 12 dogs. *J Am Anim Hosp Assoc* 2003;39:435-445.
- 6.Case JB, Mayhew PD, Singh A. Evaluation of Video-Assisted Thoracic Surgery for Treatment of Spontaneous Pneumothorax and Pulmonary Bullae in Dogs. *Vet Surg* 2015;44 Suppl 1:31-38.

Details of pilot study already undertaken: *For example, retrospective analysis of your own clinical cases, or in-house testing of methodology*

We have recently reviewed over 20 cases from the university of Bristol and estimated a 90% survival rate following initial surgery and 60% following a second surgery/ treatment for relapse.

Study design: *Exactly how is the key question (above) going to be answered? This must allow full feasibility assessment of the intended work by AVSTS*

epidemiologists, and should include the following, where relevant: study type, cases (eligibility, ineligibility), controls, treatment schedule, outcome assessment, randomization, blinding, statistical design, study power, anticipated duration of data gathering

Study design: Retrospective study

Cases of dogs having received surgical treatment for spontaneous pneumothorax due to the presence of lung bullae or blebs (confirmed by surgery or histology) will be included. Inclusion dates will range from 2000 to 2016. Variables will be collected on the data table attached. Cases will be excluded if pneumothorax is not due to the presence of lung bullae or blebs.

Statistics- descriptive statistics will be used- inferential statistics and tests will be used depending on the type of data acquired: chi-square tests and t-tests to compare categorical and continuous variable respectively. Multi- and uni-variate analysis will be used on the different variables (see data table) acquired, and multiple regression analysis will be used to identify the potential pre-defined risk factors for recurrence (see supra).

Ethical review: *please submit a separate Application For Clinical Research AHT Ethical Approval form with this submission, as a PDF. The AHT Clinical Research Ethics Committee has agreed to act on behalf of the AVSTS for ARC studies.*

See attached

What specific requirements are there for other centres intending to participate? *For example post-graduate qualifications, RCVS hospital tier level, equipment requirements, caseload etc*

All centers welcome!

Owner consent form template: *for distribution to other centres. Please submit as a PDF*

N/A

Data table template: *for distribution to other centres. Please submit as an Excel file*

See attached

Costing and Funding: *Please include details of the anticipated costs and of funding sources secured or to be approached*

Self funded study

Personal Statement:

I have read and understood the process by which the AVSTS Research Cooperative operates, detailed on the AVSTS website (www.AVSTS.org.uk) as the AVSTS Research Cooperative (ARC) algorithm. I accept and will comply fully with the spirit and letter of this algorithm. If I fail to comply with this process, as written, then I accept that I may lose the right to be first author of this project, no matter how much work I have put in already. I will respect the decision of the Coordinator and Supervisor and return and delete the raw data provided to me. I will not use, or seek to use, the data given to me for any reason other than this ARC Project.

Signed:



Print name: Guillaume Chanoit

Date: 7 June 2016

Please print, sign and send this ARC Application Form to Mr I Nicholson, Southern Counties Veterinary Specialists, Forest Corner Farm, Hangersley, Ringwood, Hampshire, BH24 3JW.

Please email the following PDFs to inicholsonvet@gmail.com : ARC Application Form; Application form for Clinical Research AHT Ethical Approval; Owner Consent Form Template; all articles referred to in the Introduction. Please also email an Excel file of the Data Table Template to the same address. Please note, all file names should be of the format firstinitialsurname_formname ie "jbloggs_ethicalapprovalform.pdf"

All submissions will be treated confidentially