In vitro comparison of ligature security using a surgeon’s knot, sliding knot, and strangle knot constructed by veterinary students

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INTRODUCTION
UK veterinary students are commonly taught to place vascular pedicle ligatures using surgeons and sliding knots. Friction knots have recently gained attention, particularly in low resource neutering schemes, and some studies conclude they produce a highly secure ligature. This suggests friction knots as a method of securing a ligature should be taught in veterinary school. The purpose of this study was to determine if veterinary students can achieve a more secure ligation with a friction knot compared to surgeons and sliding knots in a model.

MATERIALS AND METHODS
A model fatty ovarian pedicle was created, composed of a Jelco® 18G x 1¼” IV catheter inserted into a piece of Allevyn®. Twenty veterinary students were recruited; none of the students were aware of or knew how to construct a strangle knot (type of friction knot) before the study. All students had previously been taught the surgeons knot during practical classes. Videos demonstrating how to tie the three knots were created by the primary author and distributed to the students before data collection. Additionally further instruction and an opportunity to practice tying the knots occurred immediately before the study.

Students performed three separate ligations using each knot (surgeons, sliding and strangle) on three models with 3 metric Vicryl. Each candidate scored ease of learning and performing the strangle knot by questionnaire. The quality of each ligature was tested by measuring fluid flow through the catheter.

RESULTS
The mean ± SD ease of learning and performing the strangle knot (1 (hard) -5 (easy) scale), were 4.30 ± 0.87 and 4.30 ± 0.73 respectively. Mean flow rates ± SD (Median) with the surgeon’s knot, the sliding knot, and the strangle knot were 66.1 ± 42.3 (83.0), 62.90 ± 41.8 (76.0), and 23.0 ± 39.1 (1.5) ml/min respectively. Ligations using the strangle knot had significantly lower flow than those with surgeon’s and sliding knots. 15/20 (75%) of the students considered that the strangle knot allowed them to produce a secure ligation and 9/20 (45%) reported that they would choose this knot to perform ovariohysterectomy / ovariectomy.

CONCLUSION
The strangle knot is easy to learn and perform, and allows surgeons to easily construct a more secure ligature than either the surgeon’s or sliding knots. Friction knots should be taught in veterinary school and may help reduce surgical anxiety and complication.

The incidence of post-attenuation neurological signs in 243 dogs with congenital portosystemic shunts

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INTRODUCTION
The development of post-attenuation neurological signs (PANS) occurs in approximately 10% of dogs surgically treated for congenital portosystemic shunt (CPSS). The cause of these neurological complications is poorly understood, although they are distinct from pre-operative signs of hepatic encephalopathy (HE). Currently we have no way of predicting which dogs are at risk of PANS pre-operatively.

OBJECTIVE
To investigate possible risk factors for the development of PANS in dogs following surgical CPSS attenuation. Based on subjective clinical experience we hypothesized that older dogs would have a greater risk of PANS.

METHODS
The medical records of dogs that had surgical CPSS attenuation in our hospital between 2000 and 2015 were retrospectively reviewed. Clinical signs of pre-operative HE were graded 1–4. Dogs that suffered post-operative neurological complications (PANS) were identified. PANS was subjectively graded 1–4. The presence of post-operative seizure activity was also recorded.

RESULTS
Two hundred and forty-three dogs undergoing surgical CPSS attenuation were included (79% extrahepatic, 21% intrahepatic). One hundred and forty dogs (57.6%) had a partial suture ligation and 103 dogs (42.4%) had a complete suture ligation. Twenty-five dogs (10.3%) suffered PANS, including 11 dogs (4.5%) that experienced seizures. PANS score was 1 in nine dogs (36.0%), 2 in six dogs (24.0%), 3 in eight dogs (32.0%) and 4 in two dogs (8.0%). Five dogs out of 11 (45.5%) that suffered seizures died or were euthanased as a result.