

occlusion caused by the port itself. At this stage, peristalsis, that cannot push the luminal content aborally, will instead pull the intestinal segment orally. This can eventually lead to the exit of the proximal intestine until the luminal content in the herniated portion will block this progression. Distally, being the intestine empty, it is easily and progressively brought into the hernia. This progression ends only when the ileum is involved and traction on the ileocaecal valve prevents this phenomenon.

**Conclusions:** This hypothesis can explain why the ileum is involved in the majority of cases of internal hernias. Eventually, antiperistaltic drugs administered early in the course of the disease, may reduce the length of intestine affected.

**Ethical animal research:** No ethical approval required.

**Source of funding:** None.

**Competing interests:** None.

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### STANDARDISATION OF CRITICAL DECISIONS AND COSTS TO REDUCE EUTHANASIA IN COLIC SURGERY. A SINGLE-CENTRE PROSPECTIVE STUDY IN ITALY

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**Background:** Pre- or intra-operative euthanasia is often chosen for financial constraints or presumed poor prognosis. This can reduce the total number of horses potentially saved with colic surgery, despite the actual condition of the horse.

**Objectives:** To reduce pre- and intra-operative euthanasia of colic cases due to financial constraints and presumptive 'poor prognosis'.

**Methods:** For cases admitted for colic surgery, a standard protocol for critical decisions was used. To eliminate the financial factors, owners were offered a standard range of price for colic surgery, regardless of the eventual need for resection and anastomosis.

**Results:** Price quotation for colic surgery was 4800-5800 euros and was well accepted by owners and sustainable by the hospital. Two-hundred and eleven cases were admitted (66 medical, 145 surgical). Consent to surgery was given in 132/145 horses. Euthanasia for decision of the surgeon were 2/132 before surgery (viscera rupture), and 8/130 intraoperatively (5 because of viscera rupture, 2 for excessive length of necrotic small intestine, 1 for unresectable large colon). Two horses died during anaesthesia and 4 were euthanised in the recovery stall. This led to 115 horses that stood after anaesthesia. Twelve horses were euthanised because of post-operative complications. Seventy-nine percent of operated and 89.5% of recovered horses were discharged from the hospital.

**Conclusions:** Standardisation of procedures and costs resulted sustainable, while reducing biases due to the surgeon choice or owner decision, and with survival rates comparable to other studies. One of the main causes of death was the owner not giving consent to surgery.

**Ethical animal research:** No ethical approval required.

**Source of funding:** None.

**Competing interests:** None.

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### CLINICAL COMPARISON BETWEEN A SKIN-STAPLED AND A CONTINUOUS LEMBERT PATTERN FOR JEJUNOJEJUNAL END-TO-END ANASTOMOSIS IN HORSES

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**Background:** One-layer jejunojejunal anastomosis is considered effective in horses. Several patterns have been proposed but rarely compared clinically.

**Objectives:** The objective of the study was to compare outcome and complications of a modified skin stapled and a continuous Lembert pattern in jejunojejunal anastomosis in horses

**Methods:** Data from clinical records of 24 horses that underwent jejunojejunostomy between January 2018 and January 2021 at the University of Turin VTH were retrieved. Short-term complications, short- and long-term survival (>9 months) were compared after a modified skin stapled (12 horses with strangulating lesions, 1 with non-strangulating lesion), and a continuous Lembert pattern (10 horses with strangulating lesions, 1 with non-strangulating lesion).

**Results:** Post-operative reflux (POR) developed in 9 horses, 6 with the continuous Lembert and 3 with the skin stapled anastomosis. POR in the continuous Lembert group was caused by obstructive adhesions found at necropsy (2 cases), obstruction of the anastomotic site confirmed at relaparotomy (1 case). In the skin stapled group, one of the horses that developed POR was found having obstructive adhesions at necropsy but not involving the anastomosis. Short-term survival was 85% (11/13) for skin stapled anastomosis, and 72% (8/11) for the continuous Lembert pattern. Long-term survival (>9 months) was 100% for skin stapled anastomosis, and 90.9% for continuous Lembert pattern.

**Conclusions:** Both patterns performed well in clinical use, although the Lembert continuous pattern has a higher risk of developing POR.

**Ethical animal research:** No ethical approval required.

**Source of funding:** None.

**Competing interests:** None.

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### EX VIVO COMPARISON OF LIGATURES AND HAEMOSTATIC CLIPS FOR MESENTERIC VESSELS OCCLUSION IN SMALL INTESTINAL RESECTION AND ANASTOMOSIS

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**Background:** In equine abdominal surgery extensive resection and anastomosis of small intestine is a commonly performed procedure. To provide haemostasis, absorbable ligatures, surgical staplers and vessel sealing devices have been proposed in horses.

**Objectives:** To compare haemoclips and ligatures, for occluding equine mesenteric vessels.

**Methods:** Ten portions of jejunum with associated mesenteric vessels were collected from 12 horses at a local abattoir and divided into two groups. In Group A, each mesenteric artery was ligated with three circumferential ligatures tied with a sliding knot with two overthrows. In Group B, each artery was occluded with application of three haemoclips. The procedures were performed by the same experienced surgeon. Intestinal length, construction time and leaking pressure were measured and compared between groups.

**Results:** The bowel length of specimens was  $3.78 \pm 0.43$  m (mean  $\pm$  SD) in group A and  $3.04 \pm 0.83$  m in group B. The difference was not significantly different ( $p = 0.297$ ). The construction time was  $7.03 \pm 0.34$  min (mean  $\pm$  SD) in group A and  $2.40 \pm 0.43$  min in group B. The difference was highly significant ( $p < 0.0001$ ). The leaking pressure was 1000 mmHg (750–1050) (median, IQ range) in group A and 1050 mmHg (800–1050) in group B. The difference was not significantly different ( $p = 0.225$ ).

**Conclusions:** The haemostatic clips are a valid alternative to ligatures closed with sliding knots in providing vessel occlusion but are faster to apply.

**Ethical animal research:** No ethical approval required.

**Source of funding:** None.

**Competing interests:** None.

#### References

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### INCOMPLETE ILEOCECAL BYPASS FOR ILEAL PATHOLOGY IN HORSES: 21 CASES (2012–2019)

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**Background:** Incomplete ileocecal bypass can be performed in cases in which an ileal dysfunction is suspected but resection of the diseased ileum is not necessary.

**Objectives:** To describe the clinical findings, the surgical technique, and the outcome of 21 cases of colic with ileal pathologies that underwent an incomplete ileocecal bypass.

**Methods:** Records of horses diagnosed with pathologies involving the ileum or ileocecal valve that underwent ileocecal anastomosis without resection were retrieved. Clinical (heart rate, duration of symptoms, presence of reflux, age, weight at arrival) and surgical (surgical pathology, duration of surgery, type of anastomosis) data were retrieved and analysed. Data on short-term survival and post-operative complications (colic, post-operative reflux, incisional infection, fever), length of hospital stay, and long-term follow-up were also obtained.

**Results:** A total of 21 horses met the criteria; 13 horses had ileal impaction (one with muscular hypertrophy), 5 horses had epiploic foramen entrapment, and 3 horses a strangulating lipoma. An incomplete ileocecal bypass was performed with a two-layer hand-sewn side-to-side technique in 19 cases

and with a stapled side-to-side technique in two cases. Short-term survival was 95.2%. At 12-months follow-up, all horses but two were alive, and 13 of the 14 sport horses returned to their previous level of activity. Long-term survival was 90.47%.

**Conclusions:** Incomplete ileocecal bypass may represent a valid surgical technique in case of ileal dysfunction when ileum resection is not necessary; this technique may represent an alternative to extensive manipulation of ileal impaction.

**Ethical animal research:** No ethical approval required.

**Source of funding:** None.

**Competing interests:** None.

### A NEW TRANSILLUMINATION TECHNIQUE FOR VESSEL IDENTIFICATION DURING RESECTION OF THE SMALL COLON

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**Background:** Transillumination has been described in human surgery to improve vessel visualisation both using a surgical lamp or an endoscope, but has not been described in horses. Since the equine mesocolon contains a great amount of fat which restricts visualisation of the vessels, this method could be useful during small colon resection. In the method initially proposed, the assistant surgeon should hold the organ between the theatre lamp and the surgeon, while the latter bend to see the distribution of the supplying vessels. Thus the surgeon is in a non-optimal operating position while performing the dissection. Further, if applied to the mesocolon, there is risk to stretch the vessels while holding it up.

**Objectives:** To describe a new, simple technique of transillumination of the mesocolon to provide an improved surgical view during vessel ligation.

**Methods:** Six horses underwent resection and anastomosis of the descending colon. The assistant surgeon placed a smartphone with the torch turned on in a sterile glove and placed it on the surgical field with the light upwards. The portion of colon to be resected was then laid over the smartphone such as that the mesocolon was backlit facilitating the dissection, ligation and transection of vessels.

**Results:** The vessels were clearly and easily identified and dissected, ligated and transected without any non-essential damage to them. No complications related to the use of the new method were reported.

**Conclusions:** The transillumination technique proposed is simple, inexpensive and, compared to the use of a theatre lamp, allows the operator to stand in an optimal, upright position.

**Ethical animal research:** No ethical approval required.

**Source of funding:** None.

**Competing interests:** None.