

## Use of a knotless absorbable barbed suture combined with a topical adhesive skin closure system in horses following ventral midline celiotomy: a comparative clinical study

Lepage Olivier, Moulin Nicolas, Verkade Marlies, François Isé



### Introduction

#### Celiotomy (*linea alba*)

- Need to remove skin sutures or staples
  - ☑ Need sedation
  - ☑ May be risky for the practitioner
  - ☑ Extra-cost for the owner

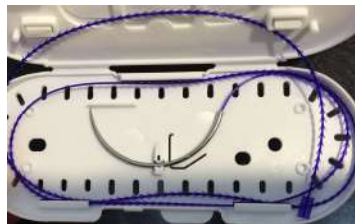


## Introduction



### Barbed suture

- Provide good tension distribution & wound apposition
- Described in horses (Ragler 2013)
- Advantages
  - ☑ Equivalent (?) biomechanical properties
  - ☑ Good cosmetic results
  - ☑ Reduce complications rate



## Introduction

### Mesh tape and skin adhesive

- Need good wound edges apposition
- Give a good seal of the wound (Dumville 2014)
- Used in human, never been reported in equine surgery



## Objective

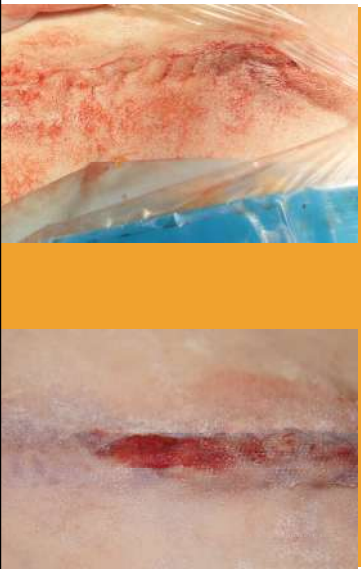
Determine the efficacy of knotless **barbed absorbable suture** with a **topical mesh and adhesive device** for closure of the skin after emergency exploratory celiotomy



## Material & Methods

- Prospective study from 2015 to 2018
- Animal Ethics Committee N° 1595
- One DECVS, 2 residents
- **Inclusion criteria**
  - ✓ Emergency celiotomy
  - ✓ Owners consent
- **Exclusion criteria**
  - Second celiotomy
  - Endotoxemia at admission or in the first 24h post-op
  - Not expected to survive more than 60 days





- **36 horses**
  - ✓ Closure of the *linea alba* similar for all individuals
  - ✓ Randomly distributed in 2 groups

**G1: conventional closure technique**

Superficial soft tissue layers

- Glyconate monofilament 2/0
- Continuous pattern

Skin: staples

**G2: barbed suture & skin adhesive**

Superficial soft tissue layers

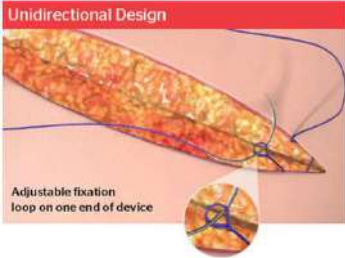
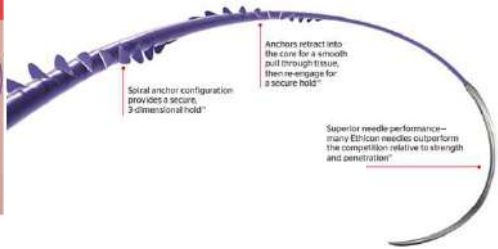
- barbed monofilament 0 (tensile strength size 2-0)
- Continuous pattern

Skin: mesh & adhesive

Material & Methods

### Barbed suture

- Monofilament 0
- Strength and support to maintain tension for 1-2 weeks
- Absorbs in 90-120 days
- Unidirectional

STRATAFIX™ Spiral Knotless PDS Tissue Control Device (Ethicon, UK)

## Material & Methods

### Mesh tape and skin adhesive

A two-part skin closure system consisting of:

- ✓ A 2-octyl cyanoacrylate **adhesive**
- ✓ A flexible, self-adhesive polyester **mesh**



Dermabond Prineo 60 cm mesh and applicator (Ethicon, UK)

## Material & Methods

### Data recording and measurements

- Age, sex, weight, breed
- Intestinal disease
- Enterotomy or intestinal anastomosis
- Incision length (cm)
- Time (min) for superficial soft tissue and skin closure



Material & Methods

**Surgical wound management:**

- Non-adherent wound dressing (cicaplaie sterile®, S&N, UK)
- Abdominal belt




**Post-operative period**

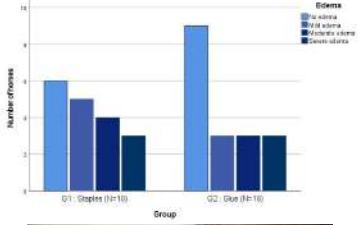
- Daily assessment: edema, discharge, pain, dehiscence
- After discharge : telephone interview (± pictures)





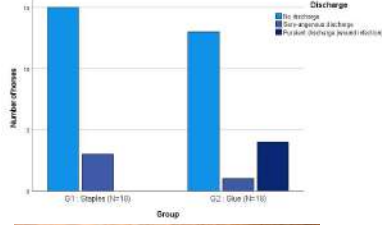
Results

**Occurrence and severity EDEMA**





Group	No edema	Mild edema	Moderate edema	Severe edema
01: Staples (n=10)	5	4	3	2
02: Clips (n=10)	10	3	3	3

**Occurrence and severity DISCHARGE**

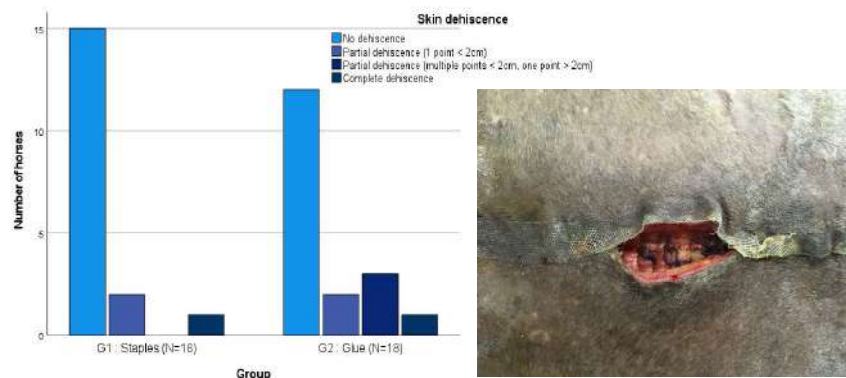


Group	No discharge	Discharge present	Discharge present/dehiscence
01: Staples (n=10)	10	3	0
02: Clips (n=10)	10	1	3

Moderate positive correlation between oedema and discharge  
(R=0.575, P < 0.001)

## Results

Occurrence and severity  
DEHISCENCE

Strong positive correlation between discharge and occurrence of dehiscence  
( $R=0.939$ ,  $P<0.001$ )

## Discussion

- **Closure time** significantly longer ( $P = 0.004$ ) in G1
  - (14 versus 18 min)
  - learning curve of the new material ?
- High incidence of **edema formation**: but no hernia
- **Purulent discharge** in 4 G2: focal fading and wet stains on the mesh are easily noted, facilitating earlier intervention
- **Estimated cost** +/- €135 versus €25 (+ additional appointment)



### Conclusion

Knotless barbed suture covered with a mesh tape is a **feasible alternative** for skin closure with a **similar complication rate** to conventional closure

### Clinical significance

- ✓ Decrease discomfort and potential physical injury at the time of removal.
- ✓ Useful for other procedures (limbs, enucleation...)

