AN ANAESTHETIC COMPLICATION AND WHAT WE DID ABOUT IT: TURNING ERROR INTO IMPROVEMENTS

Alice Bird

MA VetMB DipECVAA MRCVS

What is a significant event?

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Includes critical events:

- Any unintended or unexpected incident which could have or did lead to harm for one or more patients

I would also include any mortalities even if no obvious error involved (confirm this assumption is true...could we do better next time?)

Why audit significant events?

Aim: To ensure a comprehensive, structured, thoughtful and less accusational investigation and analysis of events, going beyond the usual identification of fault and blame

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Individual blame is unhelpful and often not the whole picture

- Circumstances leading up to the final event are often multifactorial
- If personnel involved did hold some responsibility, rarely intentional
- Blamed personnel often feel a high level of guilt and self blame already
- Rarely reduces the re-occurrence of an incident as the rest of the ‘iceberg’ not addressed
- Individual blame without proper analysis of the event can be detrimental as discourages admission of error or willingness to discuss openly

The alternative of ‘these things can happen’ may be true in some circumstances, but are you sure? Is there a better way so these things ‘don’t happen’?

RCVS KNOWLEDGE

Why audit significant events?

Identifies ALL the contributory factors – gaps and inadequacies in the system as a whole

Identifies factors with the greatest impact and factors which can be addressed to reduce further risk of error

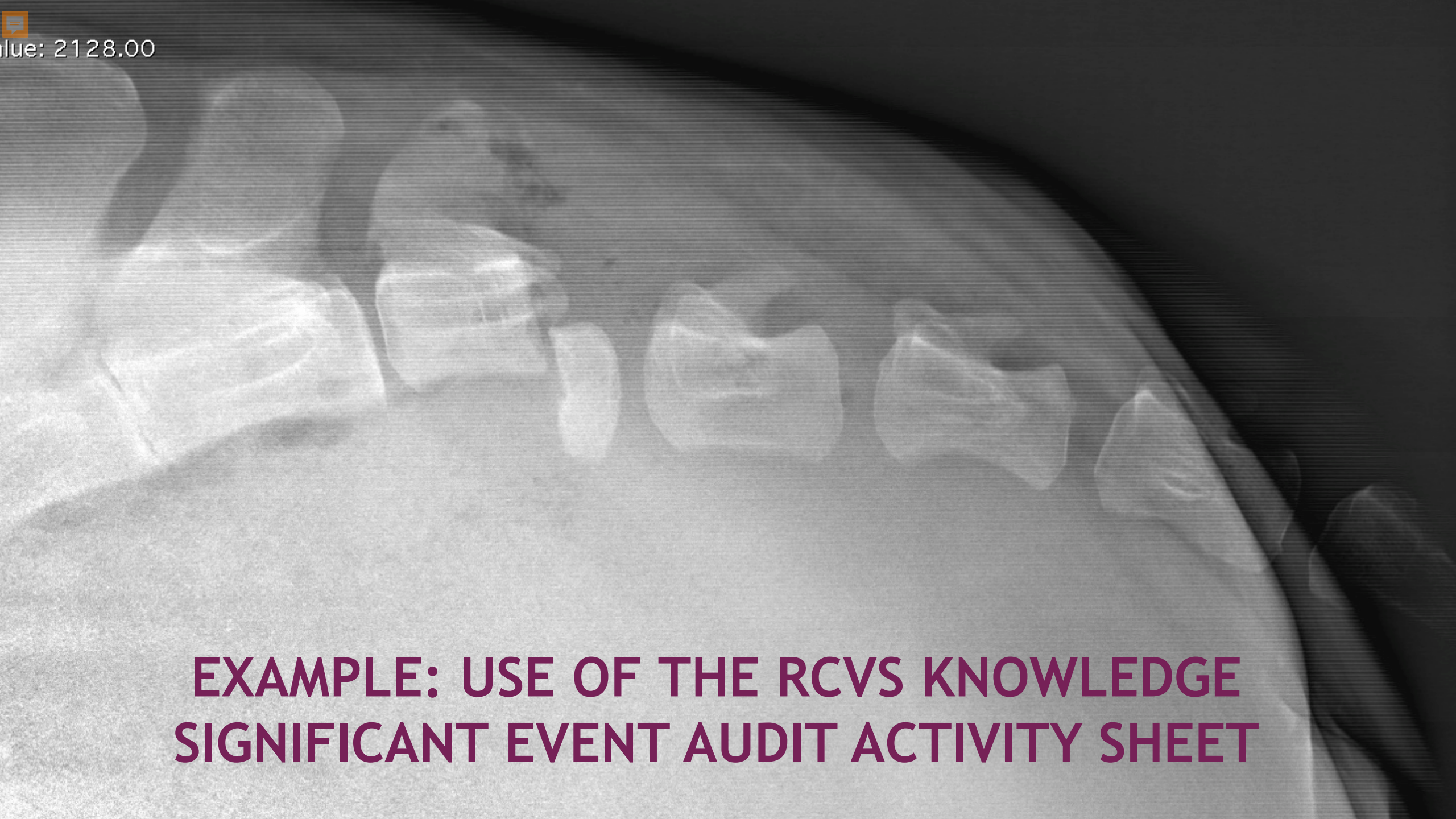
Why audit significant events?

We cannot eliminate error completely….

- We are humans not superheroes
- As a profession we don’t know everything

….But we can act to reduce it and prevent errors repeating themselves

Formal structured investigation of ‘events’ is a well established procedure in aviation, military, oil and nuclear industries. They are also increasingly being adopted into human medicine



EXAMPLE: USE OF THE RCVS KNOWLEDGE SIGNIFICANT EVENT AUDIT ACTIVITY SHEET

Click here to enter your practice name and then click on the image placeholder to insert your logo

Significant Event Audit Activity Sheet

Significant Event Audit is conducted by bringing together your team and the relevant case notes and discussing the patient episode. It is important that it is discussed without any blame – allowing staff to provide honest and constructive feedback on how they contributed to the care process.

Significant Event Audit is completed in 6 stages:

- **Stage 1** - Awareness and prioritisation of a significant event
- **Stage 2** – Information gathering
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- **Stage 4** – Agree, implement, and monitor the change
- **Stage 5** – Write it up
- **Stage 6** – Report, share and review

Title:	Click here to enter text.
Date of significant event:	Click here to enter a date. Use arrow for date picker.
Date of meeting:	Click here to enter a date. Use arrow for date picker.
Meeting lead:	Click here to enter text.
Team members present	Click here to enter text.

What happened?

Click here to enter text.
Include a brief description of the context, event, and outcome. Describe this neutrally and blame-free.

Why did it happen?

System factors:	e.g. training required, unforeseen staff absences etc.
Human factors:	e.g. human error, pressure etc.
Patient factors:	e.g. existing risk, animals interfering with wounds etc.
Owner factors:	e.g. compliance with instructions/doses
Communication factors:	e.g. communication, team changes etc.

What has been learned?

Click here to enter text.
Describe how the event and outcome can be addressed:

What has been changed?

CPD/training required:	Click here to enter text.
New protocols/changes to protocols:	Click here to enter text.
Further audit required?	Click here to enter text.
Other:	Click here to enter text.

Follow-up date

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CASE EXAMPLE - Issue 1

- 20 year old 500kg gelding
- Admitted for removal of multiple tail and perianal melanomas
- Previous tail melanomas removed 2 years previously under epidural anaesthesia (100mg xylazine diluted to 10ml total volume) with no complications

- Sedated in stocks with detomidine + butorphanol
- Epidural performed- 100mg xylazine + 40mg mepivacaine diluted to 4ml total volume
- 15 minutes post epidural developed HL ataxia but remained standing
- Laser removal of melanomas completed uneventfully
- Horse walked out of stocks after completion of surgery (45 min post epidural)
- Showed severe hind limb ataxia and fell into a dog sitting position

What are your initial reactions?

1) Intern must have incorrectly performed the epidural

2) Perhaps we didn't inject the right drug doses (incorrectly drawn up or not followed the reported 'safe' doses in the literature)

3) This horse is showing an odd reaction, must be sensitive to the drugs

4) This can happen sometimes

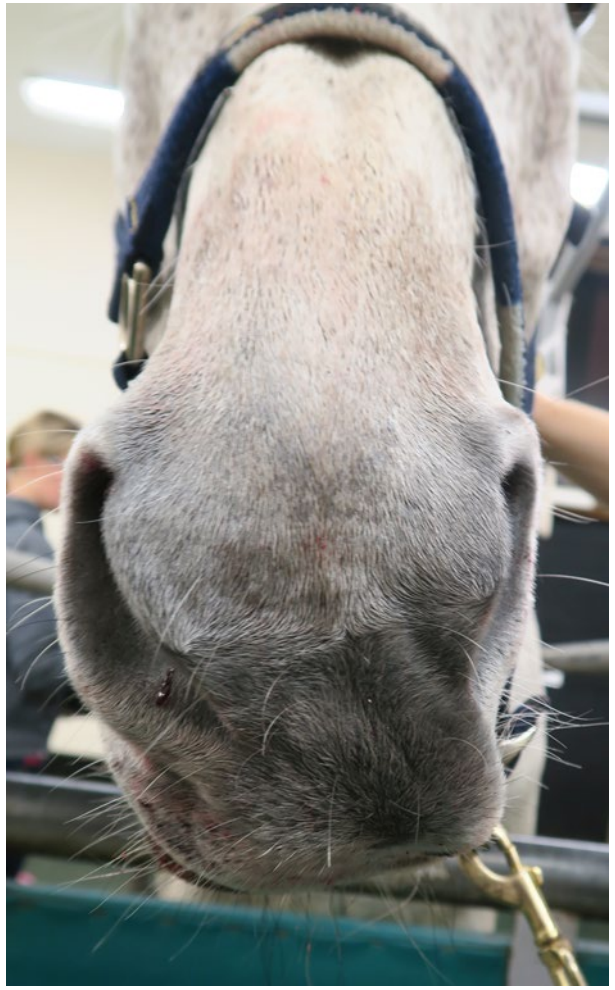
5) Panic, what do I tell the owner

CASE EXAMPLE - Issue 2

- Horse was re-sedated, anaesthetized and moved to theatre recovery box
- Kept anaesthetized for around 3 hours before being allowed to come round with head and tail ropes in place
- Multiple unsuccessful attempts to stand
- Upon first standing, tail rope locked in clutch system to provide support – horse fell again and clutch jammed causing delay in release
- Finally stood just over 4 hours post epidural

Resultant complications…..

What happened?



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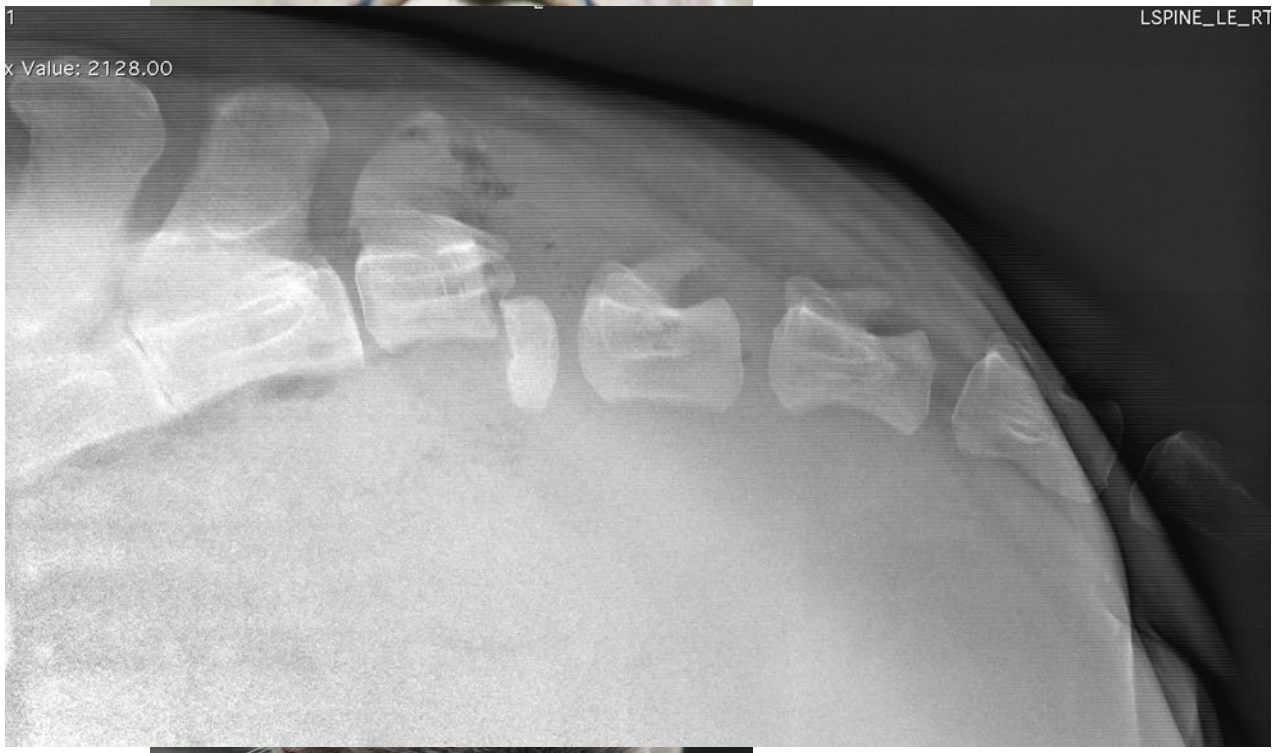

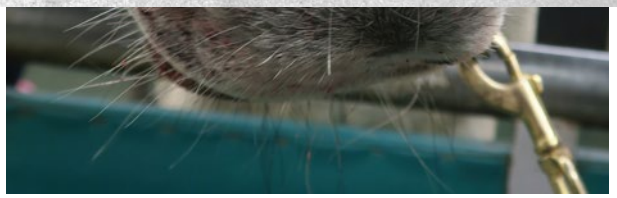

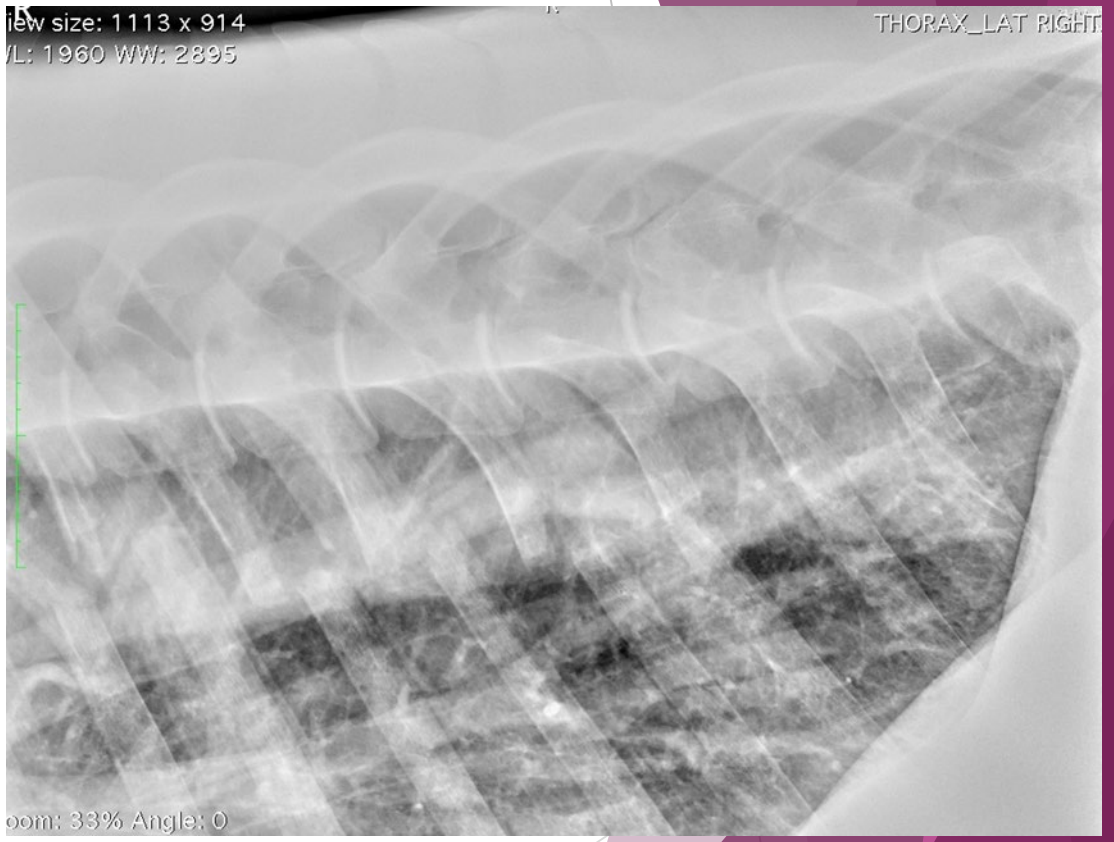

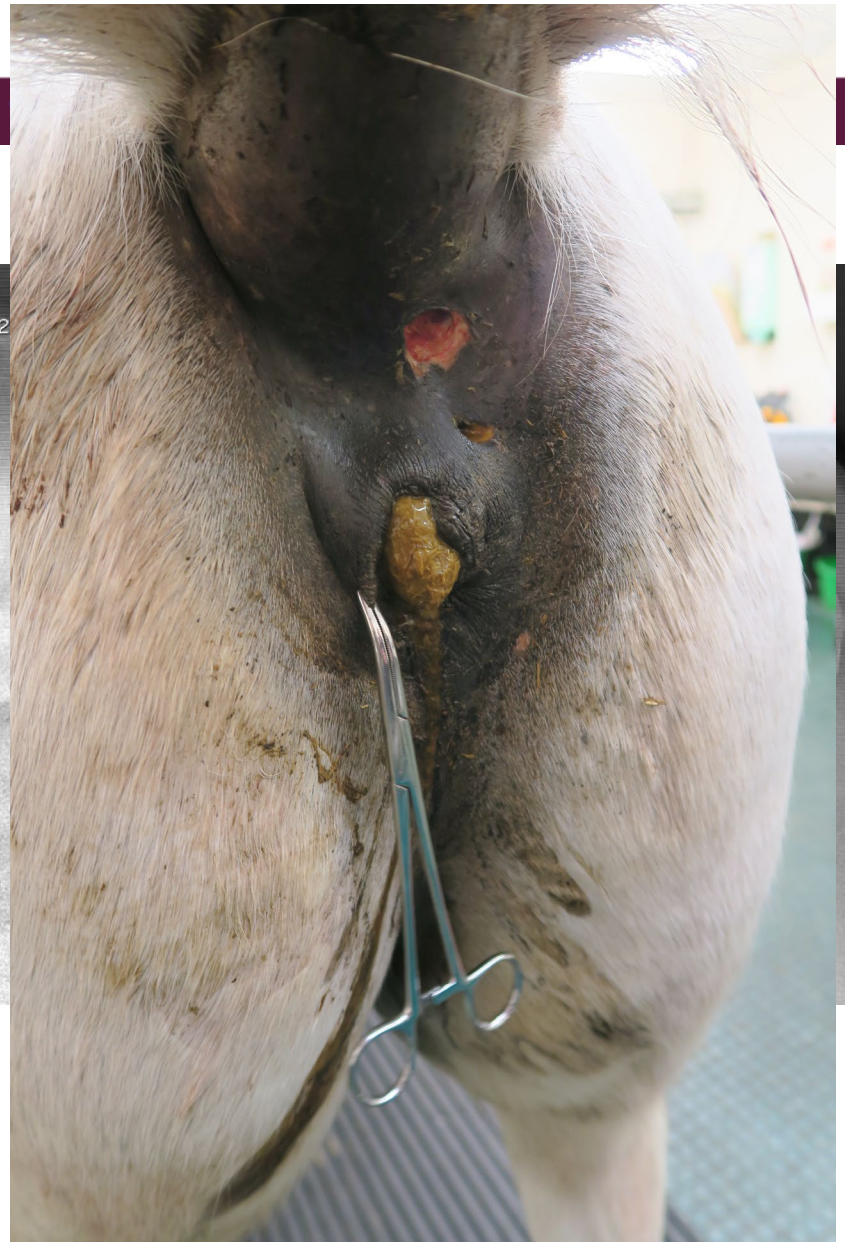

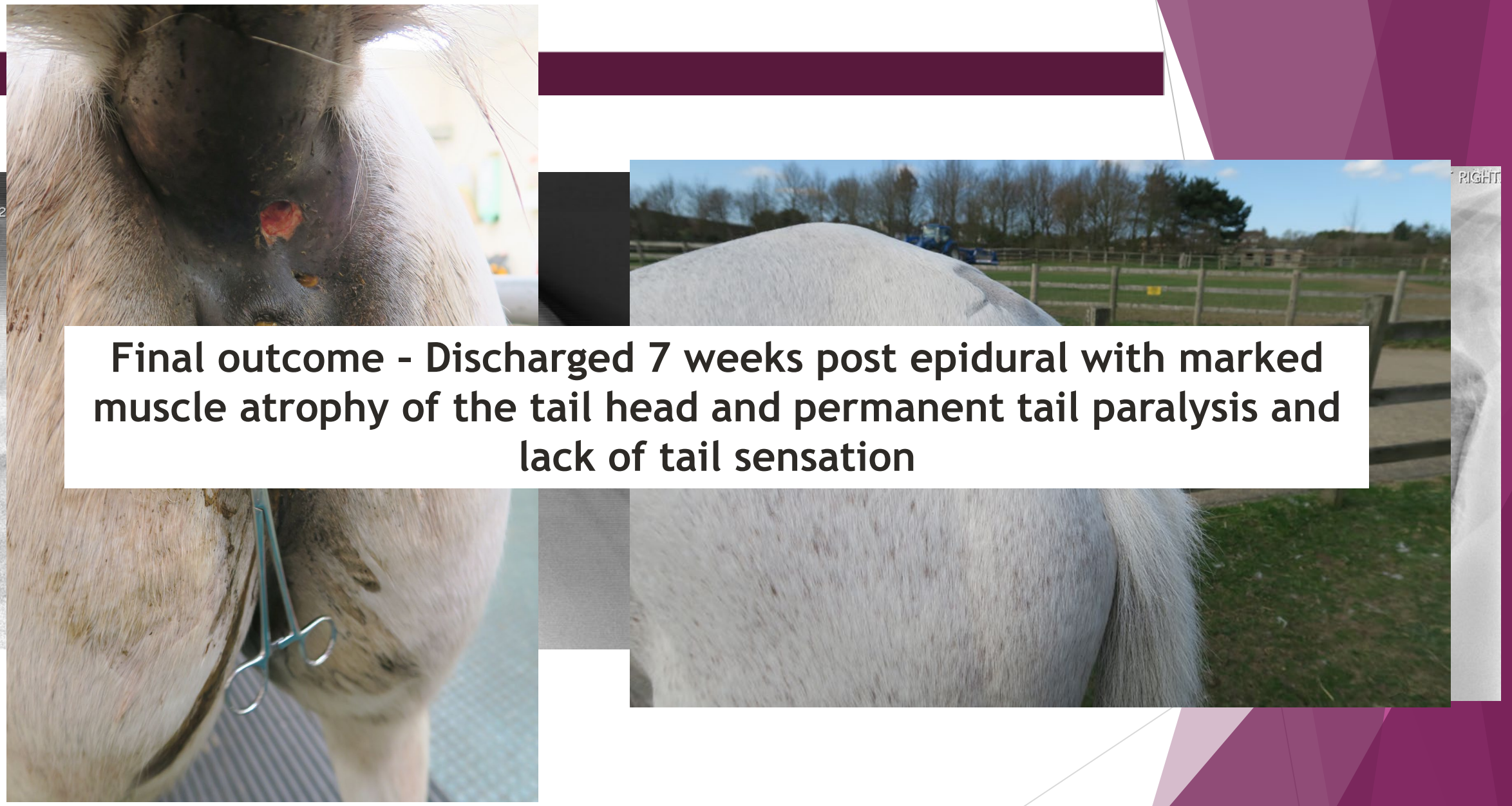

Final outcome – Discharged 7 weeks post epidural with marked muscle atrophy of the tail head and permanent tail paralysis and lack of tail sensation

What are your initial reactions?

1) Ropes were used incorrectly

2) Unfortunate incident with clutch system jamming

3) Horse woken up too soon

4) Equine recovery from anaesthesia is a known risk

5) What a total f  k up, what am I going to tell the owner

Why did it happen?

System factors
Human factors
Patient factors
Owner factors
Communication factors

System factors

- Had staff been provided with the correct knowledge/skills/experience?
- Was intended help e.g. supervision, nurse assistance etc. unavailable?
- Were staff distracted due to too many demands at once/overworked?
- Were drugs/equipment checked properly?
- Equipment failure?
- Checklists/SOPs available? Failure of checklists/SOPs?
- Were there unrealistic expectations of staff/timing?
- Had there been previous failure to respond to staff concerns and therefore concerns weren't raised this time?
- Poor planning/preparation?
- Staffing levels?
- Did culture of the clinic contribute?

System factors – Epidural causing ataxia

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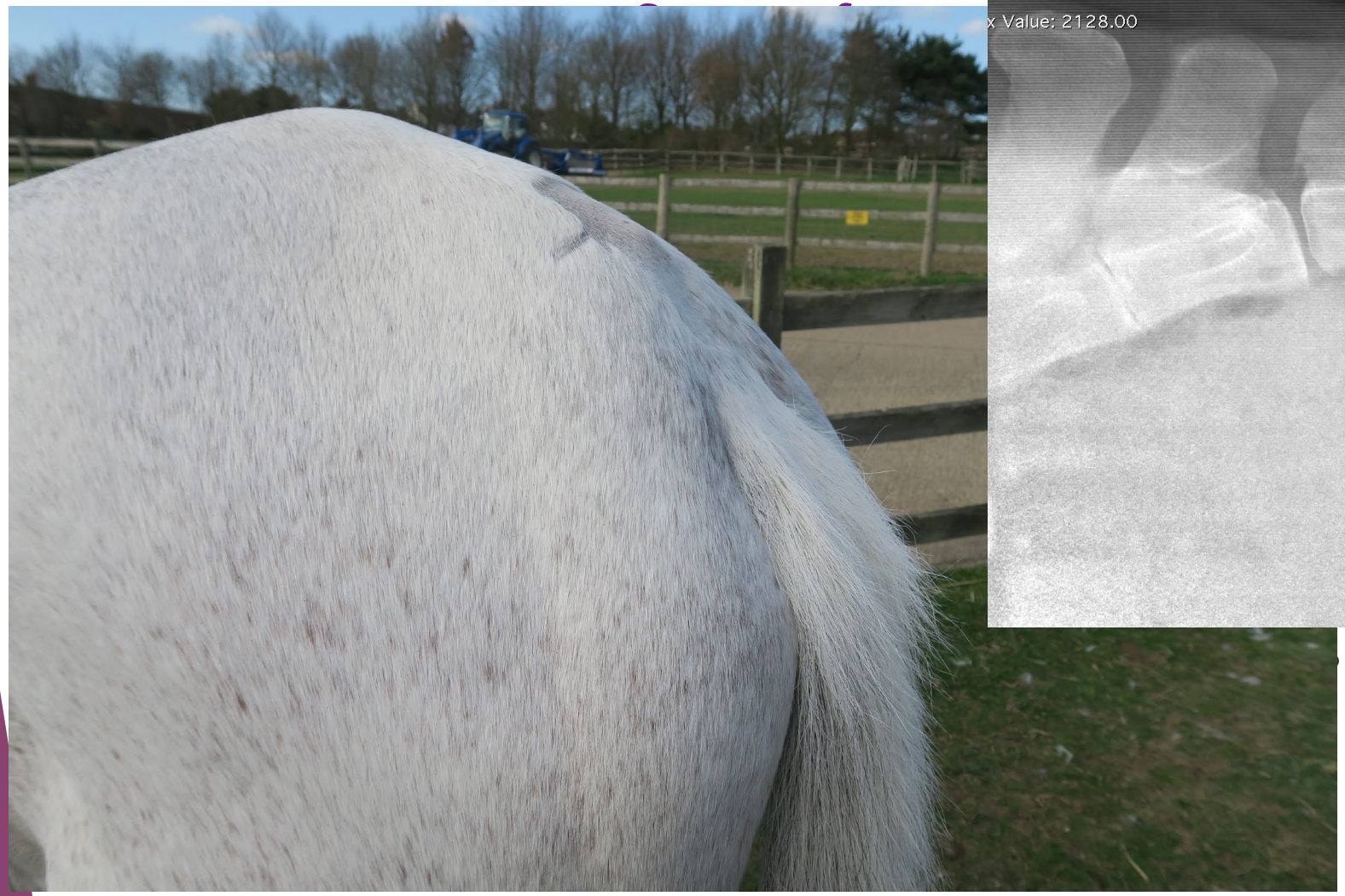

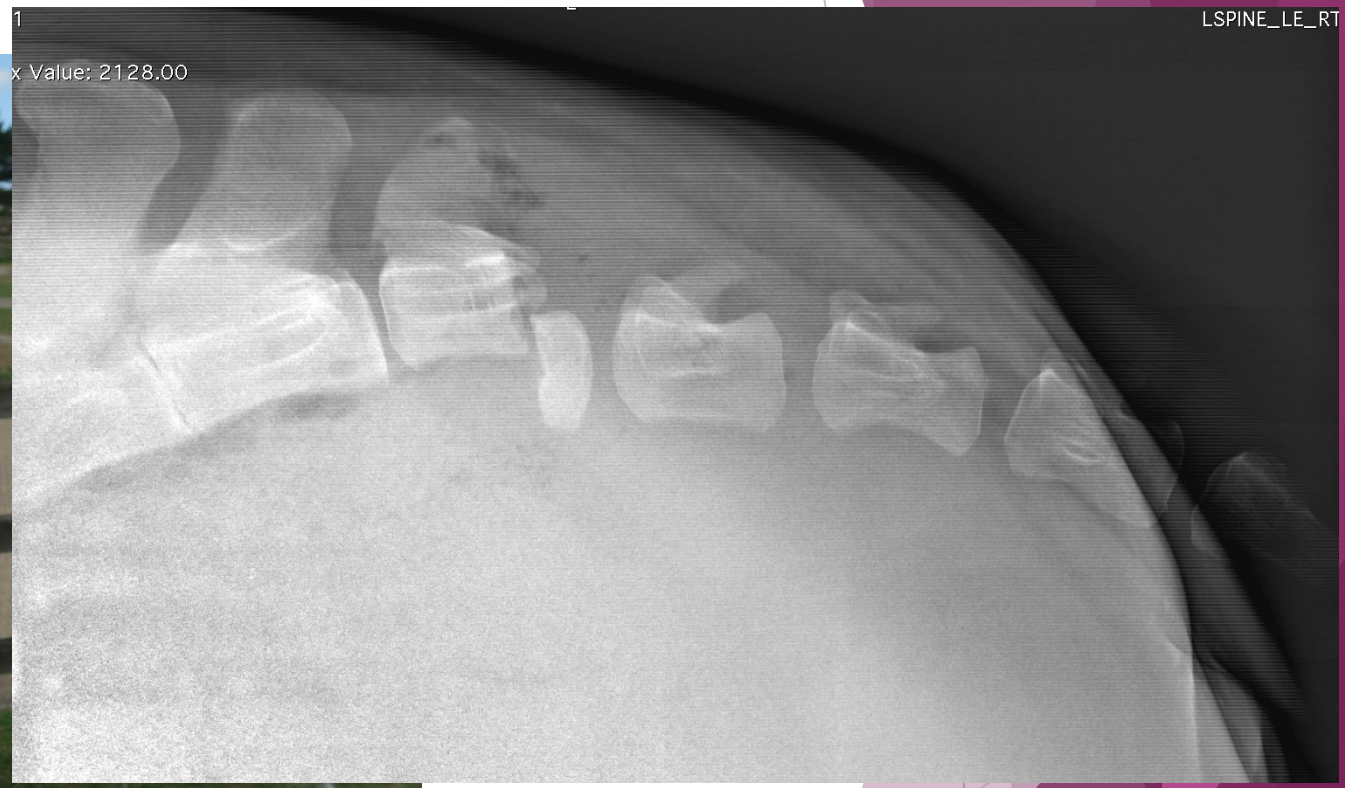

System factors – Recovery complications

- Had staff been provided with the correct knowledge/skills/experience? Unrealistic expectations?
- Was intended help e.g. supervision, nurse assistance etc. unavailable?
- Were staff distracted due to too many demands at once/overworked
- Were drugs/equipment checked properly?
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Human factors

- Did staff make a mistake?
- Did staff feel they could ask for help? Was help asked for where it should have been?
- Were staff tiered/Stressed/distracted?
- Was support/supervision appropriate
- Were there issues in team attitude/collaboration which contributed?
- Were SOPs followed?

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Patient factors

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Owner factors - Epidural ataxia

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Owner factors – Recovery complications

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Communication factors

- Did the intern get the wrong instructions or misinterpret instructions?
- Did team communicate effectively?
- Did changes in team members impact on the situation?

Communication factors- Epidural ataxia

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What has been learned?

Describe how the event and outcome can be addressed

What has been changed?

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Further audit required?
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1) Epidural and resultant ataxia

What has been learned?

- Epidural was performed as per instructed and without apparent mistake
- Staff reported previous possible cases with similar ataxia – to perform audit of practice records
- Further investigation needed as to whether technique and doses were as per the recommended literature
- Did the horse's presenting complaint contribute? – to look into literature
- Staff involved feel better following proper assessment, initial assumption of intern blame no longer present

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What has been changed?

- To await for review meeting - to report results of audit/literature search

2) Recovery and subsequent complications

What has been learned?

- Risk in rope recovery set up identified with clutch system
- SOP was followed but needed re-assessment
- Training was carried out in use of rope recovery but high turnover of interns and infrequent use of ropes contributed to complications. Training needs repeating/refreshing
- Horses temperament played a role
- To look into literature as to whether time horse kept anaesthetized was sufficient for epidural to wear off

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What has been changed?

- Clutch system changed
- SOP updated so states never to lock tail rope
- SOP updated so always have a trained permanent staff member advising/in charge of rope recovery
- Regular refresher training implemented for use of ropes
- To await for review meeting – how long should horses be kept anaesthetised if recumbent following epidural?

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Follow-up date

Todays date
Review date
Signature

Follow-up date

Additional audit performed:

- In previous 7 years, 30 epidural injections in 25 horses
- 3/30 developed ataxia 2/30 became recumbent
- All presented for melanoma removal
- 8/30 received local anaesthetic as part of the injection, 22/30 just xylazine
- All 3 with ataxia received local anaesthetic

Follow-up date

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- All 3 with ataxia received local anaesthetic

Literature search:

- Suggestion in literature that inclusion of local anaesthetic provides better anaesthesia with a faster onset than xylazine alone, but use of xylazine alone found to be sufficient in the audit of our cases
- Doses used were well within recommendations from multiple literature sources
- Spinal melanomas are reported in the literature, perhaps smaller epidural space causes more cranial spread?
- Reports in the literature for duration of motor nerve action of xylazine and mepivacaine combination for epidural administration lacking. Perhaps we didn't wait long enough?

Follow-up date

Additional changes implemented:

- Epidurals for standing surgery now performed using only xylazine at the practice

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RCVS KNOWLEDGE

Equine Veterinary Education

EQUINE VETERINARY EDUCATION
Equine vet. Educ. (2018) •• (••) ••-••
doi: 10.1111/eve.12911

Case Report

The outcomes of epidural anaesthesia in horses with perineal and tail melanomas: Complications associated with ataxia and the risks of rope recovery

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Keywords: horse; melanoma; epidural; ataxia; xylazine; mepivacaine; lidocaine; rope recovery

Summary

Melanoma is a common neoplasm in horses, with a high rate of incidence in the perineum and ventral tail. Surgical excision is often recommended to remove such masses and can be achieved in the standing horse either via local infiltration of local anaesthetic, or via epidural administration of a local anaesthetic and/or an adrenergic α_2 receptor agonist. The clinical records of all horses with tail and/or perineal melanomas that received epidural anaesthesia at a single equine hospital, over a 7-year period, were reviewed to determine the drugs administered and complications

are limited publications, however, comparing the different protocols, either in terms of their efficacy or side effects (Fikes *et al.* 1989; Grubb *et al.* 1992; Wittern *et al.* 1998).

This report summarises epidural anaesthesia injections administered to horses with tail and/or perineal melanomas, at a single hospital over a 7-year period. Associated complications are described.

Cases

The clinical records of horses with tail and/or perineal melanomas which received epidural anaesthesia at Bell

Summary

- Analysing significant events allows full assessment of contributing factors, removing sole individual blame where this is (often) not the case
- Improves team morale, willingness to discuss error and implements an ‘improvement’ culture in your practice
- It is important the discussion is done in a non accusational supportive environment
- Blame culture or lack of action following event analysis results in lack of future reporting and despondency amongst staff
- We cannot eliminate error but can learn from our mistakes
- Where no mistakes have been made, we can question best practice or highlight areas where we need to know more

Practical Application of significant event auditing (What I do)

- Implement a book to record significant events as they happen
  - Easy to spot, visible non threatening location, do not call it the ‘significant event book’

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Pink unicorn of improvement

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  - List of possible contributing factors to refer to

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- Inside front cover
  - Definition of significant event
  - List of possible contributing factors to refer to
- How to fill in:
  - Number, describe briefly what happened, list any possible contributing factors and any ideas for improvement asap after event
  - If large incident requiring a full analysis session on own, have way to indicate this (*)

Practical Application of significant event auditing (What I do)

1) Individual nearly drew up medetomidine instead of methadone

- Individual performing anaesthetic didn't check bottle properly
- New methadone supplier and bottle looks similar to medetomidine
- Individual had been on call overnight and had busy shift (tired), rushing to get first case started

Suggested improvements:

- Night duty vet not to be allocated first case of day
- To change methadone supplier back unless good reason not to, if not possible mark bottles in some way so more obvious

Practical Application of significant event auditing (What I do)

2) * Complication following epidural in horse. Developed ataxia and complications with recovery. Requires individual analysis, details recorded in full elsewhere

Practical Application of significant event auditing (What I do)

Meet once per month:

- Go through each item, discuss and on 1st clear page of book write down any actions to take from that months discussion including who will implement if applicable
- Draw line underneath ready to start recording any events for next month.
- At start of next months meeting, refresh the action points from previous meeting and then go through that months events
- Schedule date for any * events that month

Final thought

The most dangerous phrase in the language is ‘we’ve always done it this way’ – Rear Admiral Grace Hooper