



Fast localized abdominal ultrasonography (FLASH): an emergency tool

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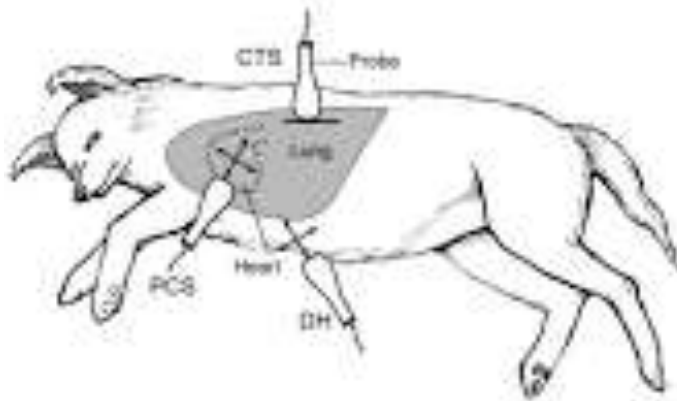
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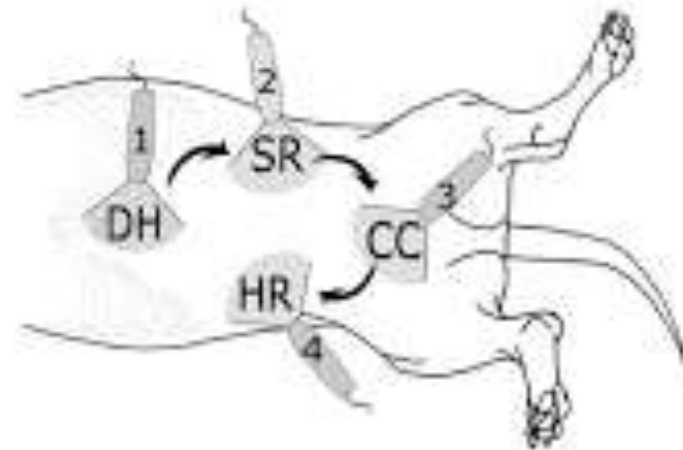
What does FLASH stand for and where is it coming from?

- **FAST** (Focused Assessment with Sonography for Trauma) → routine diagnostic tool in human and small animal trauma medicine for detecting presence/absence of free abdominal fluid following blunt abdominal trauma.

Thoracic FAST (TFAST)



Abdominal FAST (AFAST)



FLASH protocol

- Busoni et al., 2011 developed a technique for assessing horses with colic.
- FLASH (Fast Localised Abdominal Sonography



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Evaluation of a protocol for fast localised abdominal sonography of horses (FLASH) admitted for colic

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Advantages- why should I use this?

- TIME AND ACCURACY!
- Mean time 10.7 mins, (max 15 min)
- Standard procedure- good repeatability
- FLASH was able to show free abdominal fluid, abnormal small intestinal loops and abnormal colon content
- Main goals achieved
 - NS entrapment, strangulating obstruction, peritoneal effusion

Starting the exam

- Emergency, BUT take your time to
 - Sedate the horse if necessary .
 - Apply surgical spirit/alcohol to the areas to be scanned, don't waste time with clipping!
 - Dim the lights
 - Introduce patient details into machine

Examination windows

- 7 ultrasonographic windows:
 - ventral abdomen
 - gastric
 - spleno-renal
 - left middle third of the abdomen
 - duodenal
 - right middle third of the abdomen
 - cranioventral thoracic (on the right side)

Standardized sheet

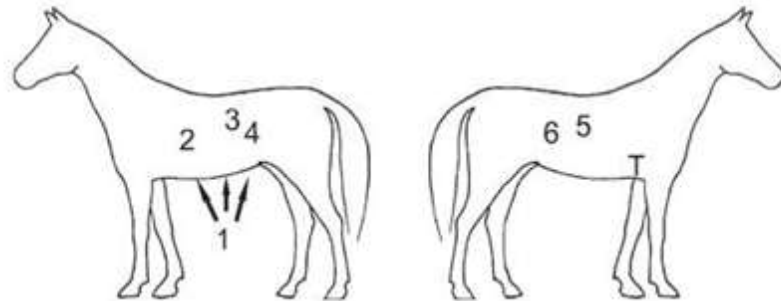
1. ventral abdomen
2. gastric
3. spleno-renal
4. left middle third of the abdomen
5. duodenal
6. right middle third of the abdomen
7. cranioventral thoracic (on the right side)

Id (Horse — Owner)

Examiner

Date Time

Nasogastric tube in place YES NO



Abnormal amount of free fluid YES NO

Dilation of the stomach YES NO

Duodenum

normal
 liquid content, non turgid
 dilated and turgid

Motility YES norm or >
 YES reduced
 NO absent

Other loops of *small intestine* visible YES NO

normal
 liquid content, non turgid
 dilated and turgid

Motility YES norm or >
 YES reduced
 NO absent

presence of thickened wall loops YES NO

Colon

normal
 ventral liquid content (1)
 lateral liquid content (4, 5 ou 6)

Motility YES norm or >
 YES reduced
 NO absent

presence of a thickened wall portion YES NO

L kidney visualized YES NO

Thorax : free fluid YES NO

Length of the US exam (min)

Protocol left/ right

Topographical locations of the abdomen assessed transcutaneously during fast localised abdominal sonography of horses (FLASH) with colic symptoms and procedure to scan each location.

Side	Site	Scanning procedure
Left	1. Ventral abdomen	Place the probe just caudal to the sternum and move caudally to assess the most gravity dependent area of the abdomen
	2. Gastric window	Visualise the stomach at the level of the 10th left ICS in the middle third (dorso-ventrally) of the abdomen and then move the probe in the 2-3 ICSs cranial and caudal to the 10th
	3. Spleno-renal window	Place the probe between dorsal and middle third of the abdomen at the level of the 17th ICS
	4. Left middle third of the abdomen	Freely move the probe around in the middle third of the abdomen
Right	5. Duodenal window	Place the probe in the 14-15th right ICS in the dorsal part of the middle third (dorso-ventrally) of the abdomen
	6. Right middle third of the abdomen	Freely move the probe around in the middle third of the abdomen
	7. Cranial ventral thorax	Place the probe on the cranial ventral thorax just caudal to the triceps muscle

- Start at the ventral abdominal window 1 on the ventral midline, moving through the windows in the listed order
- At each site note free abdominal fluid (visible as anechoic – black – regions, often triangular, between the abdominal viscera), the aspect SI loops, including motility, the contents of LI, presence of the spleen in direct contact with the left kidney (3. spleno-renal window).

How do I interpret?- Free fluid in the abdomen

- Record only when quantity is larger than normal

How do I interpret- free fluid

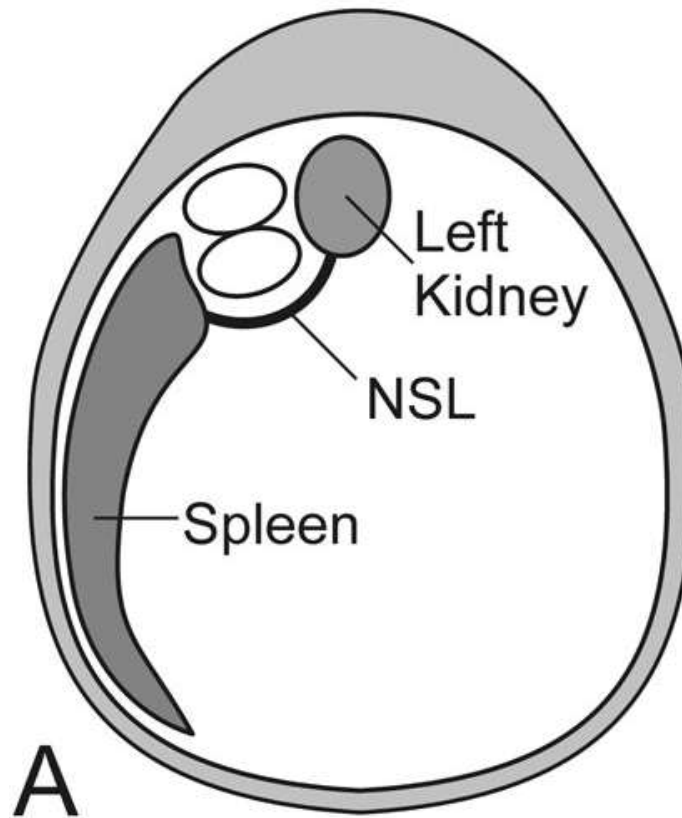
How do I interpret? Small intestine

- Small intestine is visible in most horses (Busoni et al-> duodenum in 100%, small intestine other than duodenum in 75% of the horses).

How do I interpret? Small intestine

How do I interpret? Small intestine

How do I interpret? Nephrosplenic entrapment



How do I interpret? NS entrapment

Limitations and Conclusions

- Rooms too well lit, bad contrast
 - Lack of experience vs experienced user
 - Horses in pain!!!
 - Equipment and time are limited (especially in terms of transducer)
 - No definitive diagnosis
-
- FLASH can be used in an emergency to detect major abnormalities in horses with colic.
 - If persistent symptoms but negative FLASH, these horses should undergo a comprehensive abdominal US examination !

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