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Traumatic reticulo-peritonitis in a crossbred dairy cow: Unusual clinical sign

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Abstract
In a dairy farm located at Hilat Kuku, Khartoum North, Sudan, a crossed breed dairy cow was observed displaying an abnormal clinical sign in the molasses preparation hole for five days. This sign puzzled most of the clinician who were called to attend to the case. The mean frequency of display was 3.6±0.5 times/day and the mean time spent in the molasses preparation hole displaying the unusual posture was 31.56±16.64 minutes. Means of vital clinical parameters in five days were 39.6±0.7 C°, 45.2±2.4/ minute, 86.0±4.2,1 / minute, 1. 2±0.5 / 2 minutes for temperature, respiratory rates, pulse rates and rumen contraction rates respectively. Exploratory rumenotomy revealed presence of a 32 inches long wire entangled in reticular content and perforated reticular wall to became lodged into diaphragm. Mild localized signs of peritonitis were observed. The study concluded that, this unusual sign can be considered among the clinical signs for diagnosis of cases of traumatic reticulo-peritonitis.

Keywords: dairy cow, traumatic reticulo-peritonitis, unusual clinical sign

1. Introduction
Traumatic reticulo-peritonitis (TRP) is an economically important disease because of the severe loss of milk production and the high mortality rate. Among the clinically affected animals about 25% develop incurable complications and the rest 75% expected to recover completely [1, 2, 3].
It is among the numerous diseases of foreign body syndrome in ruminants species, [4] that occurs sporadically in ruminants due to perforation of the reticulum by sharp foreign materials, thus is a common cause of abdominal surgery in cattle.
The most influencing factors includes remodeling of livestock housing, careless handling of baling wire, feed sack bags and wires, using old buildings sites for hay fields [5].
Cattle are more susceptible to foreign body ingestion than small ruminants because they do not use their lips for prehension and are more likely to eat chopped feed [6].
The structure of reticulum provides lodgments sites for the foreign body, and its contractions may be sufficient to push the sharp foreign body through the wall, thus inducing the disease [7]. If the reticular wall is injured without penetration to the serous surfaces no detectable illness occur and the foreign body may remain fixed or may remain free in the reticulum [1].
Commonly known clinical signs of TRP are sudden complete anorexia, progressive emaciation, mark drop in milk yield [8], animal is reluctant to move or does it slowly, pain and grunting, arching back and animal standing for long periods. Animal appears gaunt with scant feces and in some cases urine retention [1].
Systemic reactions are common. Temperature varies from 39.5 to 40 C°°, heart rate is about 80/ minutes and respiratory rate is about 30/minute. Temperature above 40 C° accompanied by heart rates greater than 90/minute suggesting severe complication. Rumen and reticular movement are usually absent [9].
In addition to wither pinch test, clinical signs, ultrasonography and radiography can be used for diagnosis of TRP. [10, 1]
The primary treatment of TRP is through rumenotomy which is a routine procedure for treatment and diagnostic purposes [11].
The aim of this case study is to highlight the unusual clinical sign encountered during an episode of traumatic reticulo-peritonitis in a crossbred dairy cow.

2. Materials and Methods
Study area and animals
The case was reported from a dairy farm located in Hilat Kuku, Khartoum East, Sudan. The farm was established in an area previously used for damping metallic ware and black smith workshops. The farm manages about 40 crossbred dairy cows at their various stages of reproduction and lactation. Cows were given concentrate, chopped fodders and sometimes allowed to graze on recently harvested pasture. Two shallow pit holes were dug for the preparation of molasses ration in the farm.
The animal under study was a four years old crossbred dairy cow, which was reported to be anestrous, anorexic, dull and express unusual behavior for three months post calving.

Case history and clinical examination
In a herd of 40 crossbred dairy cows of various reproductive and lactation stages, a four years old cow was reported to be anestrous for three months after calving. It stands in isolation of the others, anorexic and display unusual abnormal clinical sign. it was observed to frequently hurries to a hole meant for preparation of molasses ration, then places its forelimbs in the hole with bent down head so that the body remain in an inclined position. The cow will

remain in such posture for sometimes before moving out of the hole. This activity is replicated for several times in a day.
The animal was observed daily from 8:00 am to 6:00 pm for a period of five days.

Frequency of animal visiting the hole/day: This is the number of times the animal was seen hurrying to the hole to take the abnormal posture. Observation was from 8:00 am-6: 00 pm every day for five days

Interval between visits to the hole: It is time in hours between visits /day

Time spent in the hole: This is the period in minutes when the animal spent displaying the abnormal posture in the hole before coming out of it.

Vital clinical parameters: These includes temperature, pulse rate, respiratory rate and rumen contractions rates were recorded while the animal is outside the hole and in the hole. These records were taken every day for five days

Pain test: Pain test was conducted according to method described by [12]. Pulling up a fold of skin over the wither so that the animal's back was suddenly pressed down. This produces a painful reaction.

Rumenotomy: Exploratory laparotomy and rumenotomy were done according to [1]. Serosa wall of reticulum, corresponding peritoneum and diaphragm were examined for inflammatory signs, adhesions and abscesses. Rumen and reticular contents removed and examined for the presence of foreign bodies

Data Analysis: Collected data were inserted into Microsoft Excel. Descriptive statistics was used for the analysis of vital clinical parameters.

Ethical Approval
Ethical approval was obtained from the College's ethical committee, and local authority. consent of the animal owner was taken before the study.

3. Results
During these five days of observational, mean frequency of the cow displaying the unusual clinical sign was 3.6±0.5 times/day. Overall mean interval between each visit to the hole and time spent in the hole were 4.3±1.5 hours, and 31.6±16.6 minutes respectively (Table 1; Fig 1&2). This indicated that the animal spent most of day displaying this activity instead of concentrating on feeding and flock socialization.
The overall mean of vital clinical parameters recorded while the cow was displaying the unusual sign during the five days were 39.6±0.7 C° for temperature, 45.2±2.4/ minute for respiratory rate, 86.0±4.2, / minute for pulse rate and 1.2±0.5 / 2 minutes for rumen contraction rate, in addition to persistent positive pain test (Table 2). The same parameters were also taken when the animal is out of the hole or when the animal is not displaying the sign. They are apparently within the normal rates (Table 3). With exception of pain which elicited upon each test, other vital clinical signs fluctuate between normal and abnormal.
Exploratory rumenotomy revealed presence of a wire of 32 inches long; entangled in reticular contents (Fig.3). Its sharp end (6 inches) perforated the reticular wall and became lodged into diaphragm. Mild signs of peritonitis were also observed.

Table 1: Frequency of Display of unusual clinical sign in molasses hole (n=5)

Day	Frequency of Display	Interval Between visits (hours)	Mean±SD (hours)	Time spent in the hole (minutes)	Mean±SD (minutes)
1	4	2.20, 5.00, 6.00, 4.15,	4.34±2.00	34, 40, 22, 42,	34.5±09.00
2	4	4.10, 3.20, 3.12, 4.30	4.00±0.61	20, 45, 30, 25	30±10.80
3	3	5.05, 3.20,3.00,2.45	3.43±1.13	45, 75, 55	58.33±15.27
4	3	6.10, 6.05,8.00	6.72±1.11	15, 28, 25	22.66±6.80
5	4	4.12,2.45,4.00,5.10	3.92±1.09	15,10,12,30	16.75±9.07
Mean±SD	3.6±o.54	4.29±1.52		31.56±16.64	

Table 2: Mean±SD of vital clinical signs recorded in the hole

Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Mean±SD
Temperature C°	39.5±0.1	40.00±0.6	39.00±0.2	40.5±0.4	39.5±1.0	39.6±0.7
Respiratory rate/minutes	42±0.3	48±0.1	44±0.4	45±0.2	47±0.4	45.2±2.37
Pulse rate/minutes	80±0.3	90±2.4	86±0.6	85±4.2	89±1.5	86.0±4.21
Rumen contraction rate/2 minutes	1.0±0.1	2.0±0.1	1.0±0.3	1.0±0.0	1.0A±0.2	1.2±0.46
Pain test	+	+	+	+	+	

Table 3: Mean±SD of vital clinical signs recorded out of hole (n=5)

Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Mean
Temperature C°	39.5±1.0	39.0±0	38.5±2.1	38.5±2.0	39.0±00	38.9±1.08
Respiratory rate/minutes	36.0±2.1	39.0±2.2	36.0±00	38±1.1	39.5±2.3	37.7±1.85
Pulse rate/minutes	70.4±3.5	75.5±2.3	68.5±3.2	65.7±3.2	78.4±4.2	71.7±5.22
Rumen contraction rate/2 minutes	1.0±0.1	2.0±0.02	1.0±0.01	2.0±.03	2.0±0.1	1.5±0.2
Pain test	+	+	+	+	+	

Fig 1: unusual posture at a hole for preparation of molasses

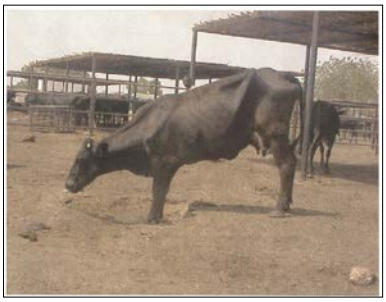

Fig 2: unusual posture in molasses preparation hole

Fig 3: Sharp Wire Extracted from Reticulum

Fig 4: Reticular contents

4. Discussion

During the five days observation period, the cow proved to spent most of its time displaying the unusual clinical sign in the hole. This activity was reflected in the emaciation and un-thriftiness of the animal's body condition.

The variable vital clinical signs depicted by the cow were persistent pain and other signs observed agreed with the results of many authors [2, 4, 6, 8]. which all points to the presence of foreign body. However, the case cannot be confirmed radiographically as one of the main limitations of this study, which is always common in many field conditions in sub-Saharan countries. Therefore, persuaded by the strength of other displayed clinical signs, an exploratory rumenotomy was conducted as an interventional measure, that revealed the presence of a wire that perforated the reticular wall and part of it became lodged into the wall of diaphragm thus evoking mild peritonitis which similar to studies reported by [1].

Display of this unusual sign was considered a result of pain emanating from rumeno-reticular contractions which pulls back the lodged wire from diaphragm thus inflicting more pain. Thus the animal by positioning its self at an inclined posture (Fig 1and 2), prevents forceful and painful detachment of the wire and therefore reduces the pain.

5. Conclusion

In conclusion, cows sustaining traumatic reticulo-peritonitis display clinical signs as a result of pain and peritonitis of which the present unusual clinical sign is one of them.

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