

Surgical Removal of Indigestible Foreign Bodies in Cattle and Economic Losses to Farmers

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To cite this article:

Fekadu Gutema Wegi, Beksisa Urge. Surgical Removal of Indigestible Foreign Bodies in Cattle and Economic Losses to Farmers. *American Journal of Zoology*. Vol. 5, No. 1, 2022, pp. 7-10. doi: 10.11648/j.ajz.20220501.12

Received: March 3, 2022; **Accepted:** April 11, 2022; **Published:** April 20, 2022

Abstract: Even though livestock are the main stay of the livelihood of the majority of the human population, the presence of many infectious and non-infectious diseases have resulted in low productivity, stunted growth, and significant economic loss among the producer. Of the major non-infectious diseases of livestock, ingestion of indigestible foreign bodies is extremely common especially in developing countries like Ethiopia. A 2 years old male Jersey Bull (body weight: 215kg) owned by Holeta Agricultural research center was presented to Animal health research and veterinary clinic department with enlarged abdomen, inability to walk, frequent abdominal distention, reduced feed intake, progressive weight loss and dullness. Based on the clinical examination and case history, the Jersey Bull was suspected to have Indigestible foreign body in its rumen. After taking all the necessary preoperative precautionary measures, rumenotomy was conducted and all indigestible foreign body was removed. Indigestible foreign bodies like plastic bag, rope, curled clothes and others were encountered. These indigestible foreign bodies are known to induce significant negative impact on the wellbeing of the animals and economic gain of the county. Therefore, overall animal health management improvement and provision of good quality feeds are the best way to prevent its occurrence whereas, rumenotomy is the best surgical intervention to handle confirmed case.

Keywords: Indigestible, Jersey, Livestock, Rumenotomy

1. Introduction

Ethiopia has the largest livestock population in Africa, with 65 million of cattle [5]. The sector supports the livelihood of 85% of rural populations in which 15 to 17% (GDP) and 37 to 87% of household incomes are contributed from the overall livestock sector. This sector also serves as a means of transportation, export commodities, security in times of crop failure, and means of wealth accumulation [7]. However, the presence of many infectious and non-infectious diseases has resulted in low productivity, stunted growth, and finally death of the animals which results in significant economic loss among the producers [14].

Ingestion of indigestible foreign bodies is a common health related problems of ruminants especially in developing countries, like Ethiopia, which is associated with poor management, and low nutritional statuses [8]. This ingestion of indigestible foreign body is called Pica. Even though it is difficult to determine the exact cause of pica, phosphorus and

sodium deficiency with absence of long fiber in cattle diet are the major reason for the ingestion of indigestible foreign bodies [3]. On the other hand, lack of appropriate waste disposal system as well as free grazing of animals in highly waste-polluted areas seemed to be a major predisposing factor for the existence of indigestible foreign body in the rumen of cattle [6]. According to different study report, plastic bag was the most commonly encountered [6, 13] followed by clothes, metallic nails, hair balls, and stone in forestomach of cattle's [9]. Hence, the objective of this case report is to share the history, physical diagnosis, clinical and surgical findings and post intervention status of young jersey to the readers and livestock producers.

2. Case Presentation

A 2 years old male jersey bull (body weight: 215kg) owned by Holeta Agricultural research center was presented to Animal health research and veterinary clinic department with enlarged abdomen, inability to walk, frequent

abdominal distention, reduced feed intake, progressive weight loss and dullness. Based on the information gathered from the attendants, this bull has been known for chewing indigestible objects such as plastic bag, clothes and rope etc.

Vital sign such as heart rate, respiratory rate, and pulse rate were measure and showed little increment. Based on case history and clinical examination, this jersey bull was suspected to have indigestible foreign body in its rumen.

2.1. Materials and Preoperative Patient Preparation

After diagnosing the presence of indigestible foreign body in the rumen of this jersey bull, rumenotomy was found to be the appropriate treatment option. Before proceeding to start operation, important surgical materials such scissors, hemostatic forceps, tissue forceps, scalpel blade, surgical needle holder, gauze, nylon and others were organized and sterilized by steam sterilization to avoid contamination and potential occurrence of wound infection. Then, the patient was properly restrained and the opening site which is 8-10cm below the transverse process of the lumbar vertebrae (left paralumbar fossa) was washed with water, soap and savlon. After washing, the hair was shaved with surgical blade from the site of opening which later washed with water, soap and savlon for the second time. Then, the opening site was smeared with iodine to minimize microbial load and latter locally infiltrated with Lidocaine injection BP (*Asence pharma private limited*) to desensitize and conduct the operation without disturbance due to pain reflux from the patient.

2.2. Surgical Procedure

Even though, operation room is mandatory to conduct rumenotomy, this case was handled on the open field in the farm compound due to the absence of the aforementioned facilities. After the iodine tincture get dry, fine incision was made to the skin with sterile surgical blade on the left flank region below the lumbar transverse process. After dissection of the skin from the subcutaneous tissue, the incision was continued chronologically through the external and internal abdominal oblique, transverse abdominal muscle, and peritoneum [2]. Then the rumen was explored, slightly taken up and stay suture was made to each margin of incision site to avoid back movement of the rumen while conducting the operation. Then the rumen was opened with great care to avoid influx of rumen fluid into the peritoneum which is with high bacterial load and can induce peritonitis.

After opening the rumen, indigestible foreign materials like plastic bag, rope, curled clothes and others were removed as can be seen from Figure 2. Bleeding during the procedure was managed by using sterile gauze and hemostatic forceps. Then, the rumen and surrounding area were rinsed with sterile isotonic saline solution and was closed by two-layer Cushing suture pattern using sterile absorbable Chromic catgut (Shandong Sinorgmed Co. Ltd) and returned back to its normal position. Then, the peritoneum and muscles were closed by simple continuous

suture using sterile Chromic catgut. After suturing the subcutaneous fascia by simple continuous suturing pattern, the skin was closed by interrupted horizontal mattress using sterile nylon. Finally, the area was cleaned properly and rinsed with iodine tincture and the patient taken to recovery room.



Figure 1. Restraining of the Animal and preparation of the opening site.



Figure 2. Opening and removal of Indigestible foreign body from the rumen of Jersey Bull.



Figure 3. Health bull after removal of foreign body through surgical intervention.

2.3. Post-Operative Management and the Outcome

After completion of the operation, the patient was provided with 5% dextrose solution through jugular vein by using infusion set. Additionally, 5ml Dihydrostreptomycin sulphate was administered through IM q24h for 5-consecutive days of post operation. The wound was also periodically cleaned and wound spray applied for three consecutive days and later as required to avoid the possible

occurrence of complicated wound infection. Besides, the patient was provided with good quality feeds and water to facilitate fast wound healing. The skin suture was removed after 15 days of post operation and the wound was completely heal after one month. Finally, the bull become healthy and active as it can be seen from Figure 3.

The main predisposing factors for the ingestion of indigestible foreign bodies are nutritional deficiencies, environmental contamination, poor feeding management and others. The detrimental effects of ingesting indigestible foreign body are stunted growth, reduced feed intake, poor nutrient absorption, poor weight gain, suboptimal production, internal injury and death following the blockade of lower digestive tract.

This non-infectious ill health in cattle can significantly affect the national economic gain from the livestock sector through under production and stunted growth of the patient, treatment cost, death and unintended culling of productive animals. In Jordan an estimated loss of \$25 million in ruminant productivity and health associated with plastic impaction was reported [4]. In Ethiopia, despite multiple study reports regarding ingestion of indigestible foreign body by cattle and other livestock, there is no clearly indicated economic loss due to this complication at the national level. This is a clearly visible and researchable gaps which needs due attention to quantify the level economic loss.

3. Discussion and Conclusion

Ingestion of indigestible foreign body is the major health related problem in cattle with significant negative impact on the wellbeing of the animals and economic gain of the county. Study conducted in Tanzania, Pakistan, Ethiopia and Rwanda reported prevalence of indigestible foreign body as 23.04%, 59.14%, 43.4% and 17.4% respectively [1, 15, 10, 11]. According to these previous study reports, Plastic bags, clothes, ropes and hairballs take greatest percentage of indigestible foreign body which match with the present case report [15]. This is because, the farm was situated at the out skirt of small town were plastic bags and old clothes are simply thrown on the open field and then taken to the farm compound by wind. Even though old age and ingestion of indigestible foreign body have positive correlation according to the report of [1]. This bull was diagnosed and confirmed to have this case at its young age. This might be due to feed shortage, nutritional imbalance, environmental pollution and poor solid waste disposal practice in the area. Accumulations of indigestible foreign bodies in the rumen interfere with the flow of ingesta and with absorption of feed [12]. The most common lesions in rumen of cattle with indigestible foreign bodies were traumatic reticuloperitonitis, perireticular abscess, esophageal obstruction, non-penetrating reticulum and ruminal foreign bodies. Animals with foreign bodies show in appetite for several days recurrent bloating, stunted growth, production loss with evidence or loss of weight. In cattle, ingestion of indigestible foreign body

imposes great economic impact as it causes loss of production and high mortality rates [9], treatment cost, and others. Since this ill health mainly induce blockade of digestive system, rumenotomy is the best option to handle the case. Overall, collaborative preventive action schemes involving professionals, environmentalist, producers and respective stakeholders are needed.

Declarations

The authors declare that they have no competing interests.

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