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National Animal Production Research Institute
Ahmadu Bello University
P.M.B 1096, Shika-Zaria,
Kaduna State, Nigeria.
Email:japr@napri.gov.ng
Website: http://journals.napri.gov.ng

FATAL RUMEN IMPACTION IN A FIVE YEAR OLD EWE (PATHOLOGICAL AND HISTOPATHOLOGICAL CHANGES): A CASE REPORT.

***Abdullahi, M., Mohammed, A. K., Hussaini, M., Wunti, Z. M. and Haruna, I.**
National Animal Production Research Institute, Ahmadu Bello University, Shika- Zaria, Nigeria.
**Correspondence: abbankabeer@gmail.com 08039681419, 08185363449.*

ABSTRACT

A carcass of 5-year old Yankasa ewe was presented with the chief complaint of sudden death. History revealed that, the sheep had been ill for five days prior to death during which there was no treatment given. Postmortem findings revealed indigestible foreign Bodies (IFB) of 3 kg and measuring 17cm consisting of polythene bags, ropes and sponges in the rumen together with thinned, stunted and sloughed ruminal papillae with un even distribution. However, the histopathological examination revealed an area of discontinuity in the epithelium exposing the submucosa using H&E (Haemoxylin & Eosin). Stain at x 200 magnification.

Key words: sheep, rumen, indigestible foreign bodies, postmortem findings and histopathology.

INTRODUCTION

Rumen impaction is a condition which results from Ingestion and accumulation of either large amounts of indigestible foreign bodies (IFB) or highly fermentable carbohydrate Feeds (Mohammed, 2013). In older small ruminants, The IFB can be Polythene materials, ropes, plastics, rags, wire and metallic objects (Igbokwe *et al*., 2003; Abebe and Nuru, 2011; Saulawa *et al*., 2012; Bwala *et al*, 2016). However, in younger small ruminants, IFB consist of licking and ingestion of self-coat hair which eventually form hair balls especially after early weaning (Blood and Radostitis, 1989; Fraser and Broom, 1990; Radostits, *et al.,* 1994 and Hailat *et al*., 1998). In either case, the IFB become lodge in the rumen and interfere with normal physiological functions including interference with the flow of ingesta, leading to rumen distention and the absence of defecation. Malnutrition is regarded to be the major predisposing factor to ingestion of IFB (Igbokwe *et al*., 2003; Abebe and Nuru, 2011; Saulawa *et al*., 2012 and Bwala *et al*, 2016). The condition is characterized by abdominal distension, presence of hard mass detected by deep palpation of abdomen from both sides, detecting pain behind the xiphoid process of the sternum, anorhexia, emaciation, lack of feces in the rectum, Depression, weakness, foamy salivation, recumbency and sudden death following obstruction of the intestinal tract (Igbokwe *et al*., 2003; Abdelaal and EL-Maghawry, 2014).

The problem has become one of the major gastro-intestinal disorders in ruminant animals causing severe losses in meat and milk production in addition to high mortality rates (Abebe and Nuru, 2011).This is more especially seen to occur in developing countries during periods of food scarcity (dry season) when Pasture and supplementary concentrate feed for intensive livestock management are limited and expensive (Bwala *et al*, 2016). Additionally, lack of proper waste disposal as well as poor recycling of house hold and industrial wastes respectively such as polythene bags, plastics, rags, wire and nails in addition to malnutrition lead to a variety of nutritional deficiencies which result in pica and ingestion of materials other than normal food including wastes (Nugusu *et al.,* 2013).

Due to the presence of these indigestible materials in the environment, significant amounts could be ingested by these animals and gets accumulated in the rumen over a long period which gradually leads to reduced feed intake, hinders the process of fermentation and mixing of contents, leading to indigestion, as well as mal- absorption of volatile fatty acids and nutrient resulting in reduced rate of weight gain and loss of condition (Igbokwe *et al*., 2003). These also obstruct the orifice between reticulum and omasum and if not removed through surgery, may become fatal (Abdelaal and El-Maghawry, 2014).

Case history

A carcass of 5- year old Yankasa ewe was presented with the chief complaint of sudden death. History revealed that, the sheep has been ill for five days prior to death during which there were distended abdomen, anorhexia and lack of defecation and with no treatment given. The carcass was found to be cachexic following physical examination.



Figure1A: Different undigested foreign bodies (polythene bags, rope and rags) weighing 3g found in rumen of the sheep at necropsy.

Postmortem examination

Postmortem was conducted on the carcass and the findings revealed indigestible foreign Bodies (IFB) of 3 kg and measuring 17cm consisting of polythene bags, ropes and sponges in the rumen together with thinned, stunted and sloughed ruminal papillae with uneven distribution. Haemorrhage and congestion in addition to sloughing and stunting of impacted ruminal papillae

can also be seen as pathological changes (Hailat *et al*., 1998). The sloughing, stunting, erosion, inflammatory response and hyperplasia can result in impairment of absorption in the affected animal (Dyce *et al.,* 2002). Thus, the impaired nutrient absorption results in loss of condition and the clinical signs associated with foreign body impaction (Igbokwe *et al.,* 2003).

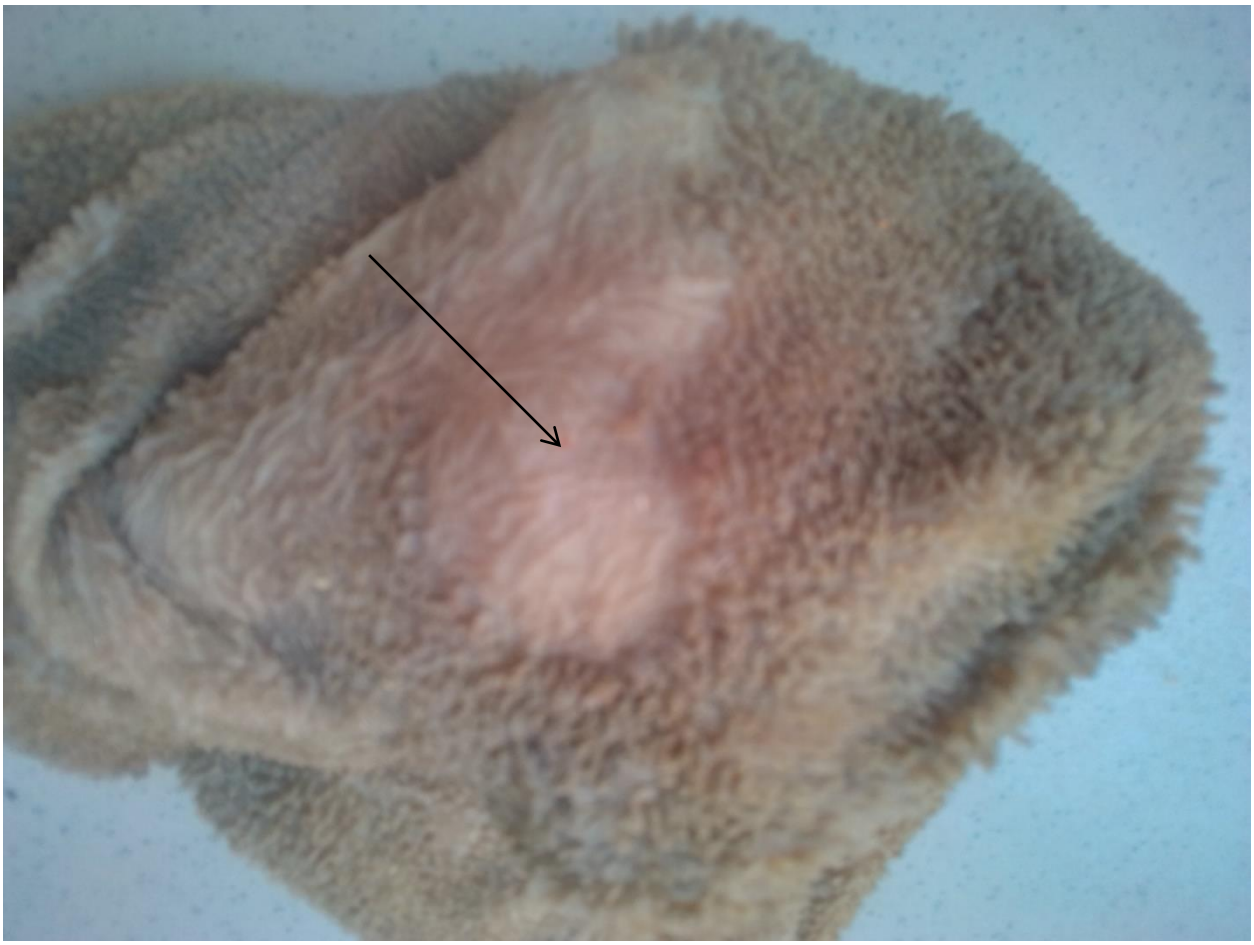


Figure-1B: Necropsy finding of affected rumen. (Note the measurement 17cm)

Histopathological examination of ruminal papillae.

The histopathological examination revealed an area of discontinuity in the epithelium exposing the submucosa using H&E stain at x 200 magnification. Coagulative necrosis, hyperemia, inflammatory processes and focal hyperplasia have been also reported as part of histological findings (Hailat *et al*., 1998). Histologic findings can also reveal hyperplasia which takes the shape of numerous epithelial islands of variable thickness, approaching the muscularis mucosae. These will reveal differentiated stratified squamous epithelium with intercellular bridgs, keratin formation and with several mitotic figures under a high power field (×40) (Hailat *et al*., 1998). It has been reported that, the rumen of severely impacted sheep is characterized by hyperplasia of the mucosal epithelium and increased keratinisation of the stratified squamous epithelium while the stratified squamous epithelium of mildly impacted rumen was mildly keratinized. This high keratinisation could have served a protective mechanism as the papillae were subjected to mechanical and chemical assaults from the IFB (Hailat *et al*., 1998).

DISCUSSION

The occurrence of IFB in this report can be attributed to malnutrition and improper disposal of wastes as suggested by (Bwala *et al*, 2016) while the emaciated carcass observed might be attributed to the interference of the foreign body with the absorption of volatile fatty acids causing the reduced weight gain (Hailat *et al*., 1997 and1998; Dyce *et al*., 2002; Roman and Hiwot, 2010). The necropsy finding that revealed sloughing and stunting of the papillae (Fig. 1B) is in line with the finding of (Hailat *et al*., 1998) who reported impacted rumen to have slough and stunted papillae that were haemorrhagic and congested. However, the histopathological examination that revealed an area of discontinuity in the epithelium exposing the submucosa (Fig. 2A) can be attributed to the gradual mechanical and chemical assaults from the IFB and ingested respectively (Hailat *et al*., 1998).

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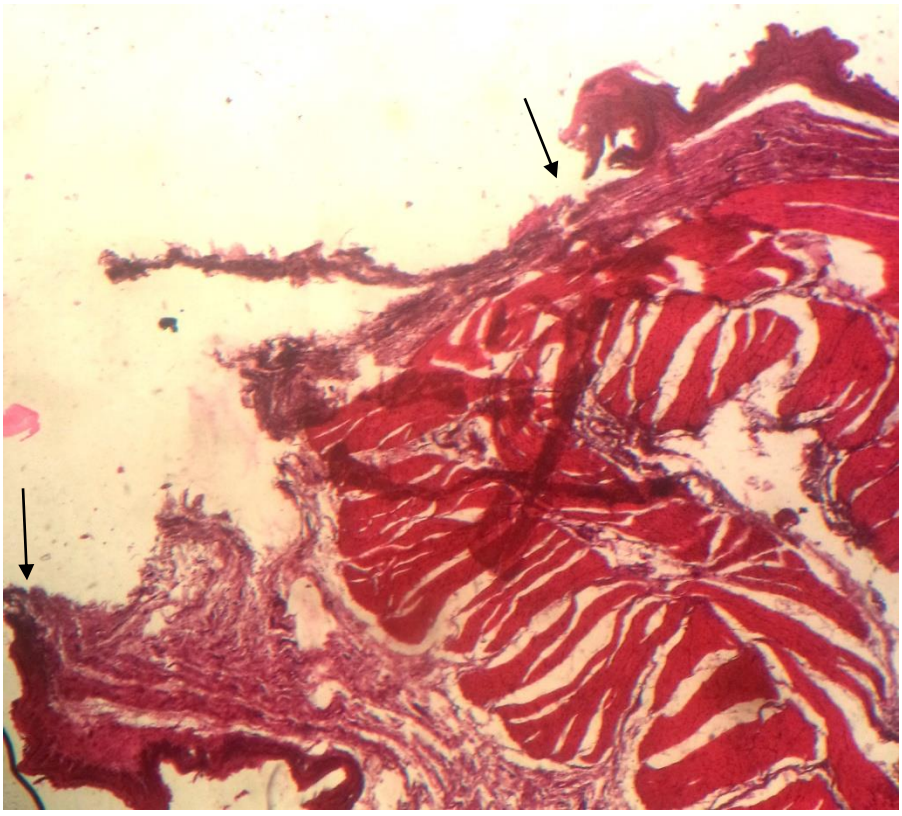


Figure 2A: Micrograph of the histologic section of sheep rumen with foreign body impaction (Note the stunted and sloughed ruminal papillae.

Ingestion of IFB by small ruminants is a common worldwide problem previously reported from Jordan (Hailat *et al*., 1997), Sudan (Bakhiet, 2008 and Ghurashi *et al*., 2009), Ethiopia (Abebe and Nuru, 2011, Tesfaye *et al*., 2012 and Nugusu *et al*., 2013) and Eygypt (Abdelaal and El-Maghawry, 2014).

In Nigeria, the problem has been reported by several authors (Igbokwe *et al*., 2003;Remi-Adewunmi *et al*., 2004; Saulawa *et al*., 2012, and Bwala *et al*., 2016). Yankasa sheep were reported to be more prone to ingestion of IFB than Uda, Balami and the cross-breeds and it was

suggested to be associated with their behavior of been high refuse dump scavengers (40.3%), followed by Uda (26.4%) and cross-breeds (33.3%) (Bwala *et al.*, 2016). IFB has been also reported to occur more frequently in females than the males probably because the females might have hyper appetite due to the nutritional demands for estrus, pregnancy and lactation (Abdelaal and El-Maghawry, 2014; Bwala *et al.*, 2016). Older sheep and those having poor body condition were found to be more frequently affected with indigestible foreign body and it was attributed to the gradual ingestion of IFB over the prolonged period of time (Igbokwe *et al*., 2003;Remi-Adewunmi *et al*., 2004; Saulawa *et al*., 2012, and Bwala *et al*, 2016). However, clinical impaction manifest mostly when the rumino-reticular orifices are partially or completely blocked by the presence of IFB or its pressure (Abebe and Nuru, 2011).

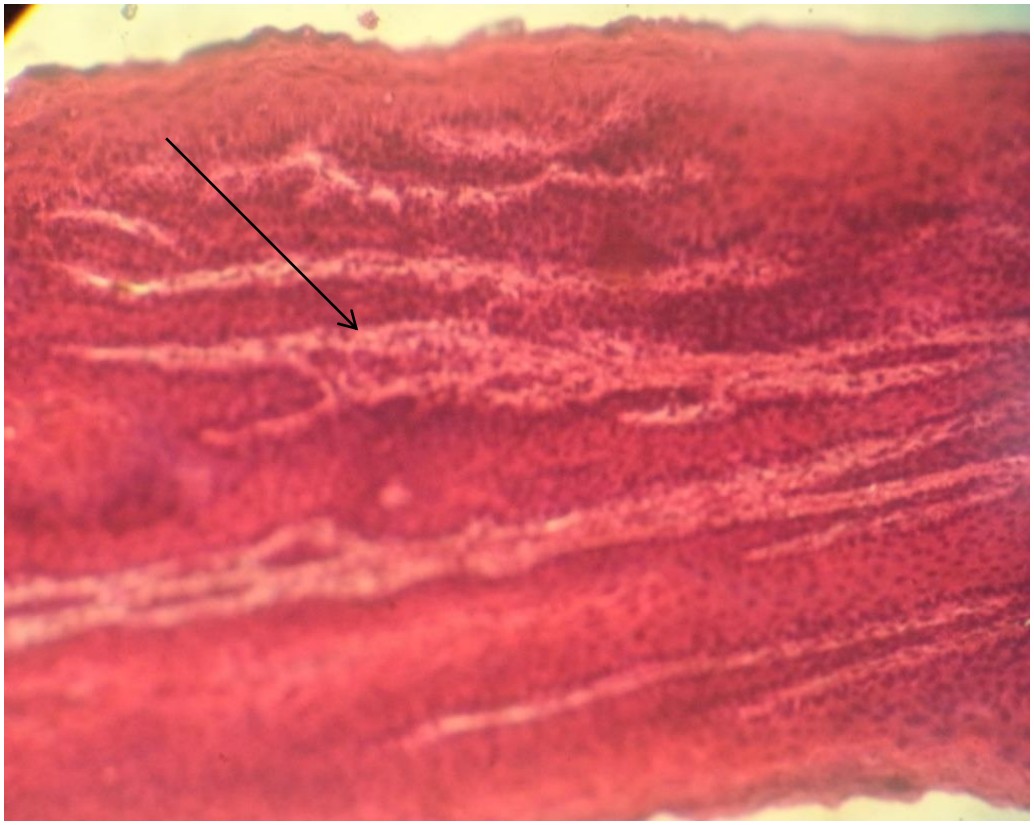


Figure 2B: Micrograph of the histologic section of normal sheep rumen. (Note the area of discontinuity in the epithelium exposing the submucosa. H&E stain x 200)

CONCLUSION

IFB is a major global challenge to small ruminant production causing great economic loss to farmers due to cost of feed and mortality. Therefore, there is need to urgently address the problem by the governments and people especially in developing countries through provision of nutritious pastures all year round as well as ensuring effective disposal and recycling of house hold, street and industrial wastes.

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