



# *Toxocara vitulorum* intestinal impaction in male White Fulani calves: a case report from Nigeria

Z. Audu<sup>1</sup> · S. E. Abalaka<sup>2</sup>

Received: 17 January 2019 / Accepted: 8 June 2019 / Published online: 18 June 2019  
© Indian Society for Parasitology 2019

**Abstract** Post mortem examinations were performed on the carcasses of two male White Fulani calves that reportedly died within a herd of about 45 cattle. Similar deaths were recorded in three other calves of the same age bracket (8–13 weeks) within a 5-day period about two weeks ago but no post mortem examinations were conducted on any of them unlike this present case. Contagious bovine pleuropneumonitis vaccination was reportedly up-to-date and the herd were recently treated with Diminazene aceturate (Berenil<sup>®</sup>) and Oxytetracycline<sup>®</sup> LA about two (2) months ago against haemoparasitism. Carcasses were in poor body condition with pale mucous membranes. The small intestines of both carcasses were grossly enlarged and impacted with numerous strands of round worms resulting in ballooned intestines with small ingesta and gas along with near empty large intestines containing few spots of faecal materials and gas. The worms were identified as *Toxocara vitulorum* while a diagnosis of *T. vitulorum* intestinal impaction was made. This case report highlights possible fatality that can be occasioned by these often overlooked mere worm burdens in calves within a herd. This calls for proactive measures to guard against this silent farmer's "kill joy" for meaningful and effective cattle production.

**Keywords** *Toxocara vitulorum* · Calves · Intestinal impaction

✉ S. E. Abalaka  
seabalaka@yahoo.co.uk

<sup>1</sup> Department of Animal Health and Production, University of Abuja, Abuja, Nigeria

<sup>2</sup> Department of Veterinary Pathology, University of Abuja, Abuja, Nigeria

## Introduction

*Toxocara vitulorum* is a large roundworm commonly found in the small intestines of bovids, especially Asian water buffalo (*Bubalis bubalis*) and cattle (*Bos taurus*, *Bos indicus*) living in tropical and subtropical regions (Woodbury et al. 2012) and has also been reported in temperate regions of the world (Chelladurai et al. 2015). The parasite is amongst the most destructive parasites of calves where the larvae undertake migration through to cause damages in many organs like the liver and intestines (Ahmed et al. 2016) causing about 30–80% estimated losses in 2–3 months old calves (Rast et al. 2013). Males and non-breeding females appear to be dead-end hosts of *T. vitulorum* infection (Woodbury et al. 2012). However, dormant or hypobiosed larvae within somatic tissues of adult pregnant females migrates to the udder some eight (8) days to parturition due to changes in the dams reproductive hormonal profiles or via a yet to be clearly understood mechanisms for their excretion in milk within the first 11 days post parturition (Roberts 1993; Raut et al. 2016) although milk excretion 3–4 weeks thereafter has been reported (Taylor et al. 2016). These dormant or hypobiosed larvae present in somatic tissues of infected dams can potentially infect calves over a 2–3 consecutive parturitions (Rast et al. 2013).

Adult animals are believed to be free of matured adult worms and therefore, lack evidence of infection like eggs in the faeces unlike their calf counterparts (Raut et al. 2016) because of an immunity that help to arrest all somatically migrating larvae in their organs and tissues as well as the expulsion of adult worms (Hansen and Perry 1994). That might be why infected adult animals shows no visible signs of the disease unlike calves (Roberts 1990) where the disease is characterized by severe anorexia,

weight loss, anaemia and diarrhea, especially in buffalo calves of 1–3 months old (Wickramasinghe et al. 2009) depending upon the number of adult worms within their intestines (Roberts 1990). Although post mortem diagnosis of *T. vitulorum* small intestinal occlusion has been reported (Chelladurai et al. 2015), most reports of *T. vitulorum* infections are focused on the prevalence and management of the infection in calves (Van der Steen et al. 2014; Ahmed et al. 2016). This calls for continuous highlighting of fatality associated with these easily overlooked calves worm burden at post mortem examinations. That is why we are reporting a case of post mortem diagnosis of fatal *T. vitulorum* intestinal impaction in male White Fulani calves within a semi-extensively managed small cattle herd in Kubwa, Abuja, Nigeria.

## Materials and methods

A client reported the death of two (2) calves in a herd of 45 cattle from a farm located in Kubwa, Abuja, Nigeria to a private Veterinary Clinic (Vet Care Essential Clinic, Wuse Zone 5, Abuja, Nigeria) on the 22nd of November, 2018. The farm had reportedly lost three (3) other calves between 8–13 weeks old within an interval of about five (5) days in what was termed “in similar circumstances” about two (2) weeks earlier prior to this present case but no post mortem examination was conducted on any one of them. The herd was administered Diminazene aceturate (Berenil<sup>®</sup>) along with Oxytetracycline<sup>®</sup> LA about two (2) months ago against haemoparasitism. Physical examination of some of the animals met grazing in the field showed varying degrees of emaciation (13/40 or 32.5%) and diarrhoea (27/40 or 67.5%) with “pot belly” calves (2/2 or 100.0%). Consequently, detailed post-mortem examination was carried out on the two (2) presented carcasses. Samples of round worms found within the small intestines were collected and sent to the laboratory of the Department of Veterinary Parasitology and Entomology, University of Abuja, Abuja, Nigeria for parasitological identification of the worms (Bhalerao 1935) and eggs from a crushed worm (Soulsby 1982).

## Results

The carcasses were grossly emaciated with visible bony prominences and ribs in poor body condition (Fig. 1) of about ratio two to nine (2/9) according to Paschal (2017). Calves have pale ocular and oral mucous membranes. The rumens were enlarged, tensed and filled with some small ingested feeds and gas while the gall bladder was markedly engorged. Most of the intestines (duodenum, jejunum and

the ileum) were enlarged, tensed and completely impaction by large numbers of round worms (Figs. 2 and 3) identified as *Toxocara vitulorum* while parts of the intestines towards the rectums were empty containing some patches of faecal materials and gas. However, no obvious gross pathological changes were seen in viscera organs of these calves. A diagnosis of *T. vitulorum* intestinal impaction was made. The farm was consequently advised to treat the herd with Ivermectin (0.2 mgkg<sup>-1</sup> subcutaneously) and Febendazole (7.5 mgkg<sup>-1</sup> orally) to be repeated in a fortnight thereafter, especially in calves within their first few days of life and thereafter.

## Discussion

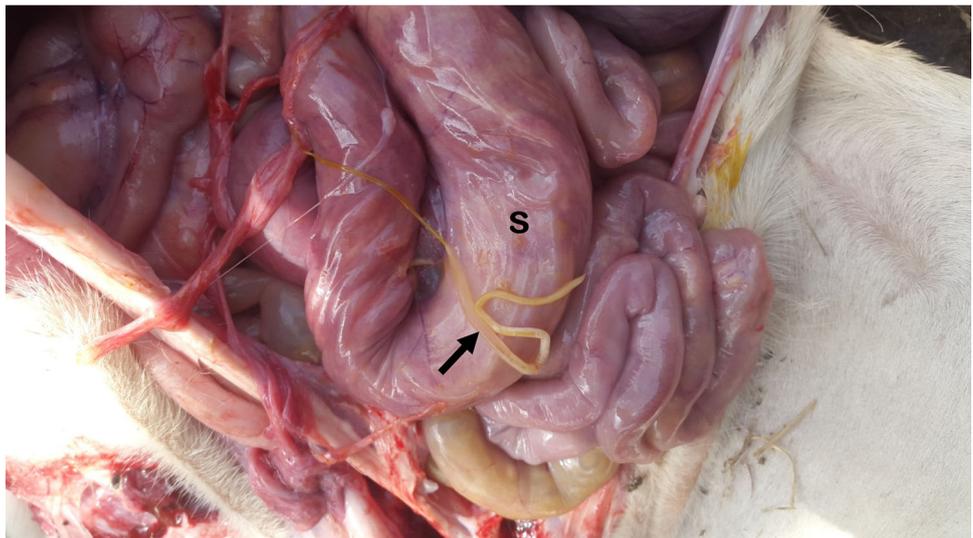
Although the general poor condition of the herd might be due to varying underlying factors, the observed poor body condition indicative of emaciation (Paschal 2017) in the carcasses might have been due to anorexia occasioned by the intestinal blockade caused by the impacting adult worms. This was evidenced by the bloated rumens with small ingesta and gas, engorged gall bladders and empty bowels posterior to the intestinal blockades indicative of interference with free flow of food for digestion. That formed the basis for the final diagnosis of intestinal impaction by the worms. The pale mucous membranes were indicative of anaemia that could have arisen from nutritional imbalance occasioned by the progressive anorexia. The absence of diarrhea in this particular case might have been due to the complete intestinal blockade that prevented the passage of any ingesta of considerable amount. The worms and eggs were identified as *T. vitulorum* based on gross morphological appearance as well as host species and age specificity (Van der Steen et al. 2014; Royal Veterinary College 2019).

Although routine calves deworming at age three months old is reportedly of no effect in *T. vitulorum* infection as peak egg excretion has already passed (Goossens et al. 2007), our advice to immediately deworm the herd with Ivermectin and Febendazole was to help reduce the worm burden in susceptible animals within the herd. The best practical control measure in calves is usually to prevent the oro-faecal contamination along with the feeding of milk replacers instead of cow's milk (Van der Steen et al. 2014) in infected herd in addition to treating calves 2–3 days old and every fortnight thereafter until 2–3 months of age (Gupta 1986). However, anthelmintic treatment of adult cattle is usually ineffective due to the drug's inability to reach the hypobiosed larvae (Roberts 1992) but pregnant cows should be dewormed some three (3) weeks before parturition to guard against prenatal infection (Saudah et al. 2012). This means that *T. vitulorum* infection is difficult to

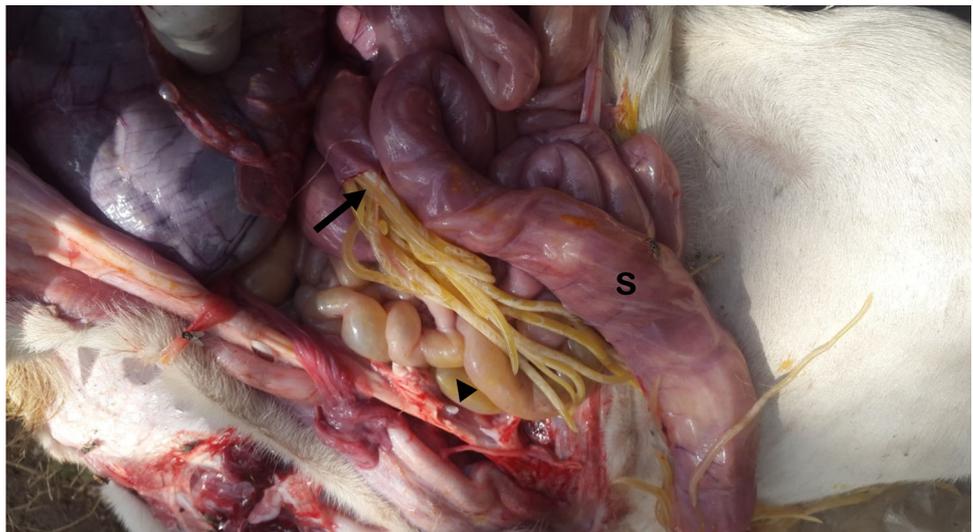
**Fig. 1** The carcass of a White Fulani calf that died of *Toxocara vitullorum* intestinal impaction in a cattle herd in Kubwa, Abuja, Nigeria. Note the emaciated carcass with bony prominences (arrows) and ribs (arrow heads)



**Fig. 2** The abdominal cavity of a White Fulani calf that died of *Toxocara vitullorum* intestinal impaction in a cattle herd in Kubwa, Abuja, Nigeria. Note the grossly enlarged and impacted small intestine (S) with an occluding piece of *Toxocara vitolorum* (arrow)



**Fig. 3** The abdominal cavity of a White Fulani calf that died of *Toxocara vitullorum* intestinal impaction in a cattle herd in Kubwa, Abuja, Nigeria. Note the enlarged and impacted small intestine (S) with occluding strands of *Toxocara vitolorum* (arrow) from incised cut surface of the small intestine along with near empty greenish yellow coloured large intestine containing gas and some faeces (arrow head)



eradicate in breeding and/or pregnant cows thereby making slaughter, where possible, a way out or treatment over a long period of time with constant faecal monitoring as suggested by Borgsteede et al. (2012). This post mortem case report has been able to highlight possible fatality associated with *T. vitulorum* infection in calves whose infection can easily be overlooked as mere worm infestations within a herd.

**Acknowledgements** We humbly acknowledge the immense contributions of Mrs. Arowolo, B. O. E. of the Department of Veterinary Parasitology and Entomology's laboratory, University of Abuja, Abuja, Nigeria for the worm and eggs identification.

**Author contributions statement** ZA and SEA performed the post mortem examinations, collected the samples, prepared and approved the manuscript for submission.

#### Compliance with ethical standards

**Conflict of interest** All the authors jointly and privately sponsored this work and therefore, declare no conflict of interest.

**Informed consent** The authors have consent approval from the owners of the calves for this case report.

## References

- Ahmed R, Wani ZA, Allaie MI, Bushra MS, Hussain HA (2016) *Toxocara vitulorum* in a suckling calf: A case study. *J Parasit Dis* 40(4):1330–1331
- Bhalerao GD (1935) Helminth parasites of the domesticated animals in India. *ICAR Monogram* 6:260–261
- Borgsteede FHM, Holzhauer M, Herder FL, Veldhuis-Wolterbeek EG, Hegeman C (2012) *Toxocara vitulorum* in suckling calves in the Netherlands. *Res Vet Sci* 92:254–256
- Chelladurai JJ, Bader C, Snobl T, Magstadt D, Cooper V, Brewer MT (2015) *Toxocara vitulorum* infection in a cohort of beef calves in Iowa. *Vet Parasitol* 30(1–2):96–99
- Goossens E, Dorny P, Vervaecke H, Roden C, Vercammen F, Vercruyse J (2007) *Toxocara vitulorum* in American bison (*Bison bison*) calves. *Vet Rec* 160:556–557
- Gupta SC (1986) Pattern and control of *Neoscaris vitulorum* infection in calves. *Indian Vet J* 63:71
- Hansen J, Perry B (1994) The epidemiology, diagnosis and control of helminth parasites of ruminants. International Laboratory for Research on Animal Diseases, Kenya. <http://cgsspace.cigar.org/handle/10568/49809>. Accessed 13 Dec 2018
- Paschal JC (2017) Some thoughts on body condition scoring of cows. *Agriculture and Life Sciences, Texas A & M University*. <http://animalscience.tamu.edu/2017/08/08/some-thoughts-on-body-condition-scoring-of-cows/> Accessed 25 Dec 2018
- Rast L, Lee S, Nampanya S, Toribio JLML, Khounsy S, Windsor P (2013) Prevalence and clinical impact of *Toxocara vitulorum* in cattle and buffalo calves in Northern Lao PDR. *Trop Anim Health Prod* 45:539–546
- Raut S, Sahu RK, Mahalik A (2016) *Toxocara* infestation in a suckling buffalo calf: a case report. *Sch J Agric Vet Sci* 3(2):123–125
- Roberts J (1990) The life cycle of *Toxocara vitulorum* in Asian buffalo (*Bubalus bubalis*). *Int J Parasitol* 20:833–840
- Roberts JA (1992) Preventative treatment against toxocarosis in bovine calves. *Vet Parasitol* 44:111–118
- Roberts JA (1993) *Toxocara vitulorum* in ruminants. *Helminthol Abstr* 62:151–174
- Royal Veterinary College (2019) The RVC/FAO Guide to Veterinary Diagnostic Parasitology. <https://www.rvc.ac.uk/review/parasitology/RuminantEggs/Common.htm> Accessed 13 Jan 2019
- Saudah S, Norhamizah AH, Fazly Ann ZA (2012) Identification of *Toxocara vitulorum* eggs in a Calf. *Malays J Vet Res* 3(2):71–74
- Soulsby EJJ (1982) Helminths, arthropods and protozoa of domesticated animals, 6th edn. CLBS and Bailliere Tindal, London, p 788
- Taylor MA, Coop RL, Wall RL (2016) *Veterinary parasitology*, 4th edn. West Sussex, Wiley Blackwell, p 48
- Van der Steen I, Pardon B, Sarre C, Valgaeren B, Van Hende D, Vlamincx L, Deprez P (2014) Intestinal obstruction by *Toxocara vitulorum* in a calf. *Flem Vet J* 83:299–305
- Wickramasinghe S, Yatawara L, Rajapakse RPVJ, Agatsuma T (2009) *Toxocara vitulorum* (Ascaridida: Nematoda): Mitochondrial gene content, arrangement and composition compared with other *Toxocara* species. *Mol Biochem Parasitol* 166:89–92
- Woodbury MR, Copeland S, Wagner B, Fernando C, Hill JE, Clemence C (2012) *Toxocara vitulorum* in a bison (*Bison bison*) herd from Western Canada. *Can Vet J* 53(7):791–794

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.