

Original Research Article

Congenital malformations in ruminants and its surgical management: a retrospective study of Sokoto veterinary clinic, Nigeria

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Received: 26 February 2020

Revised: 20 April 2020

Accepted: 24 April 2020

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ABSTRACT

Background: Congenital defects, abnormalities of structures or functions present at birth, maybe as a result of genetic or environmental factors or both and in most cases; the exact etiology is not clear but can occur in all animals. These abnormalities are responsible for slowing down of genetic progress and economic loss for the breeders, due to the death of animals.

Methods: Available record of cases presented to Aliyu Jedo Veterinary Clinic, Sokoto from December 2015 to 2019 was used to investigate congenital malformation in ruminants based on species and sex. Surgery was carried out in all the cases with local anaesthesia (infiltration technique) using lignocaine. Surgical procedures carried out were rectopexy (atresia ani), gingivectomy (gingival fibromatosis), superficial keratectomy and temporary tarsorrhaphy (dermoid cyst), casting and physiotherapy (contracted tendons).

Results: A total of 47 congenital malformations; atresia ani 22 (46.8%), gingival fibromatosis 18 (38.3%), dermoid cyst 6 (12.8%), and contracted tendon 1 (2.1%) were reviewed in the study. The ovine species had the highest incidence of cases load recorded 23 (48.93%) followed by bovine 17 (36.17%) and then caprine species 7 (14.89%). The incidence of all malformations was higher in males (68.1%) than in females (31.9%). All cases were attempted surgically with success in all the procedures.

Conclusions: It can be concluded that male ruminants have the highest prevalence of congenital malformation. Congenital malformations are more frequently seen in ovine and least seen in caprine. Atresia ani appeared to be the most commonly reported cases.

Keywords: Congenital malformation, Ruminant, Atresia ani, Gingival fibromatosis, Dermoid cyst, Contracted tendon

INTRODUCTION

A congenital defect, abnormalities of structure or functions present at birth; may be caused by genetic or environmental factors or combination of both. The exact cause of these anomalies is not known although results from pedigree analysis and breeding trials revealed that

they are autosomal recessive diseases.¹ Developmental defect may be lethal, semi-lethal or compatible with life causing aesthetic defects or having no detrimental effect on the animal. Susceptibility to agents that affect development depends on the fetal stage, but generally decreases with gestational stage.² Atresia ani is a congenital anomaly of the rectum and anus, which leads

to occlusion of the anal opening.² A dermoid cyst is a skin or skin like appendages arising from limbus or conjunctivae, and cornea.³ Gingival fibromatosis is a benign slow, progressive, non-hemorrhagic, fibrous enlargement of gingiva due to an increase in sub-mucosal connective tissue component.⁴ Contracted flexor tendons are the most common abnormality of the musculoskeletal system of newborn calves in particular. This condition is caused by autosomal recessive genes.⁵ Diagnosis of these conditions was made based on the detailed history to ascertain the cause of the deformity (genetic or environmental) and physical examination after birth as presented to the clinic. Moreover, Identification of molecular signals that guide the sequential development of organs and organ systems, coupled with molecular diagnostic tools and genomic testing, allow a more detailed understanding of many observed congenital anomalies.⁶

Congenital malformations represent a hidden danger for animal production; because they are responsible for slowing down of genetic progress and economic loss for the breeders, due to the death of animals, or damage to their reproductive ability moreover, they cause animal welfare reduction because they can imply foetal dystocia and affected animals have a reduced fitness with little chances of survival. This is typically due to an increase in the inbreeding rate and the spreading of negative alleles responsible for genetic disease, poor nutrition and management system.⁷ To avoid this problem, it is necessary not only to set up breeding plans that avoid the increase in inbreeding but also to know genetic conditions underlying the diseases exclude carriers from mating and improve nutrition and management of the animals.

METHODS

This study was conducted at Aliyu Jedo Veterinary Clinic Sokoto, during the period of 48 months from January 2015 to December 2019. The cases presented with history and clinical signs that were suggestive of congenital abnormalities were chosen from the available record for this study. Atresia ani cases were recorded in 14 male's pediatrics (8 calves, 4 lambs and 2 kids). Whereas in females, available record documented were (2 calves, 2 lambs and 2 kid). Gingival fibromatosis was recorded in 10 males (8 lambs and 2 kids). Dermoid cysts were recorded in 5 males' calves and 1 female calf. The contracted tendon was recorded in 1 lamb only.

The surgery was performed under local infiltration anaesthesia using 2% lignocaine Hydrochloride (manufactured by Ancalima® life sciences limited, India.) gives to effect. In all atresia ani, the abdomen was mildly compressed initially and the pelvic cavity has bulged. A circular skin incision was made on the bulged perineal region. A blind caudal-sac was identified, exteriorized and opened. Immediately after incision into the blind sac. The meconium and air were released. In each case, the rectal wall was sutured to the skin using a simple

interrupted pattern with non-absorbable suture material size 2/0 (manufactured by Shanghai SNWI medical company, limited India). In gingival fibromatosis, an incision was made directly at the root of the teeth (dentogingival junction) to detach the overgrown mass from its attachment and folded back to expose the teeth and excised the tissue; the gingivectomy was achieved using a scalpel blade. In dermoid cyst cases, the anaesthesia was achieved by desensitizing the eye using auricular palpebral and retrobulbar nerves block with local infiltrations using 2% lignocaine. The eyes were prepared aseptically and superficial lamella keratectomy was performed to remove the growth. Temporary tarsorrhaphy was performed to allow deposition of gentacort® gentamycin and dexamethasone combination eye drop (manufactured by Laborate Pharmaceutical India, industrial area, Panipat). In cases of contracted tendons, a wooden splint cast was applied to guide and immobilized the affected limbs, to allowed the animal to bear weight on the limb.



Figure 1: (a) An atresia ani in a 4 days lamb and (b) constructed anal opening.



Figure 2: (a) Bilateral ocular dermoid in 2 weeks old calf and (b) eyes after surgical excision of dermoid.

RESULTS

A total of 47 congenital malformation cases were reviewed in this study. Atresia ani 22 (46.8%), gingival fibromatosis 18 (38.3%), dermoid cyst 6 (12.8%), and contracted tendon 1 (2.1%). The ovine species had the highest incidence of cases load recorded 23 (48.93%) followed by bovine 17 (36.17%) and then caprine specie 7 (14.89%). The incidence of all malformations was higher in males (68.1%) than in females (31.9%). All cases were surgically corrected with success in all the procedures.

Table 1: Different congenital malformations recorded in ruminants at Aliyu Jodi veterinary clinic from January 2015 to December 2019.

Malformations	Species						Total
	Bovine		Atresia ani		Caprine		
	Male	Female	Male	Female	Male	Female	
Atresia ani	8	2	6	2	2	2	22
Gingival fibromatosis	-	-	8	7	2	1	18
Dermoid cyst	5	1	-	-	-	-	6
Contracted tendon	1	-	-	-	-	-	1
Summation	14	3	14	9	4	3	47

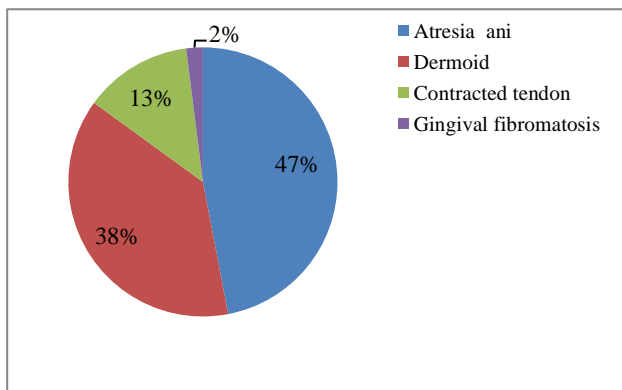


Figure 3: The percentage distribution of various congenital malformation cases.

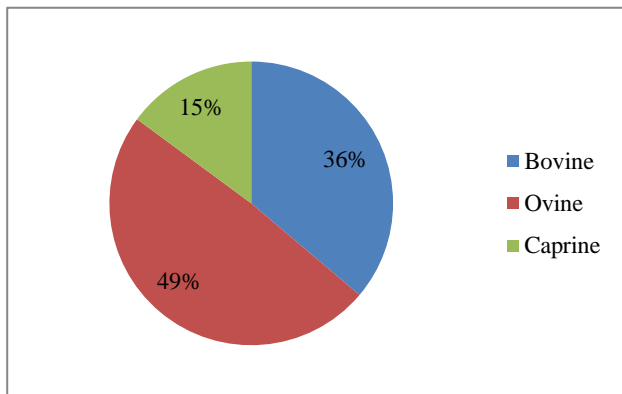


Figure 4: The percentage distribution of congenital cases based on species.

DISCUSSION

Congenital abnormalities may be lethal, semi-lethal or compatible with life causing aesthetic defects or having no detrimental effect on the animal.⁸

The most prevalent congenital malformation recorded was atresia ani. This could be due to the uncontrolled breeding of animals by the owners. The frequency of atresia ani was higher in males in our present study. A similar finding was reported in a retrospective study of atresia ani cases.⁹ The incidence of atresia ani in this

study was high in calves compared to other species. Our finding is in line with previous reports.^{9,10} This is probably due to high cases of bovine presented to the Aliyu Jedo Veterinary Clinic Sokoto, Nigeria. In the present study, all cases of atresia ani were diagnosed based on history, clinical signs. Clinical signs and physical examination findings are adequate to establish the diagnosis.¹¹ Affected animals with atresia ani need immediate surgical intervention.¹² Correction of congenital cases of atresia ani by using a modified technique of inverting the sutured skin flap and rectum was reported with success in the previous study in ruminants.¹³ In our study, all cases of atresia ani were corrected by applying simple interrupted sutures at 12, 3, 6, 9 hours without any complication like constriction of reconstructed anal opening after few days of surgery.

Congenital anomalies of distal parts of the limbs are common in animals.¹⁴ It was reported that animal with Contracted tendon flexors recovered completely after combined treatment with tenotomy, splint/cast and intravenous administration of oxytetracycline.¹⁵ And also treated cases of contracted flexor tendon by the administration of oxytetracycline only.¹⁶ In our presented study only splint/cast application with plaster of paris was carried out at time interval and the outcome was successful after two months.

Dermoid is usually located on the lateral canthus, limbus, third eyelids, medial canthus and eyelid of the eye. Bilateral dermoid is a genetically heritable autosomal recessive trait and polygenic traits.¹⁷ Bilateral ocular dermoid characterized by a corneoconjunctival dermoid in the left eye and a nictitans dermoid in the right eye was reported in cattle.¹⁸ Dermoid cases were corrected by superficial lamellar keratectomy.¹⁹ In our present study, cases of bilateral ocular dermoid was treated by using combined treatment with superficial lamellar keratectomy, temporary tarsorrhaphy and Gentacort® (gentamycin and dexamethasone combined antibiotic)

Gingival fibromatosis may be congenital or hereditary. Although the genetic mechanism is not well understood; but the majority of authors have attributed the condition to hereditary factors. Isolated cases of gingival

fibromatosis may arise from a single gene mutation, while generalized form result from alterations of multiple genes.²⁰

The treatment of gingival fibromatosis depends on the severity and extends of the gingival enlargement.²¹ When the enlargement is less severe; scaling of teeth may be sufficient to ensure normal oral function and appearance. If scaling becomes ineffective and gingival growth continues to affect function, surgical intervention becomes compulsory.²² Gingivectomy and gingivoplasty with blades, surgical knives, laser or electrosurgery is the treatment of choice to restore the normal gingival appearance and oral function.^{23,24} in our study, a moderate form of gingival fibromatosis was encountered. Gingivectomy with the blade was carried out and all the animal suckle some minutes after the procedure with an improved oral appearance.

CONCLUSION

It can be concluded that congenital malformations occur in males ruminants. atresia ani, contracted tendon, gingival fibromatosis, and dermoid can be corrected surgically. Affected animals are recommended to be fattened and culled from the herd or flock and they should not be used for breeding to prevent transmission of hereditary genetic problems to the subsequent generation.

ACKNOWLEDGEMENTS

The authors thank the staff and management of Aliyu Jedo Veterinary Clinic Sokoto for giving us access to their valuable records.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Bademkiran S, Chen H, Kurt D. Congenital rectovaginal fistula with atresia ani in a heifer: a case report. *Yuzuncu Yil Universitesi Veteriner Fakultesi Dergisi.* 2007;1:61-4.
2. Johnson JL, Leipold TT, Hudson DB. A prominent congenital defect in Nebraska beef cattle. *Breeding Reproduction.* 1985;4:1-8.
3. Ismail SF. Ocular dermoids in some farm animals. *Assiut Veterinary Med J.* 1994;30:212-20.
4. Coletta RD, Graner E. Hereditary gingival fibromatosis: a systematic review. *J Periodontol.* 2006;77:753-64.
5. Simon MB, William GD, Rao R, Sivashanker R, Suresh K. Congenital Malformations in ruminants and its surgical management. *Vet World.* 2010;3:118-9.
6. Aiello SE. Congenital anomalies. Merck Veterinary Manual. 8th edition. Merck and Rhone-Poulenc Distributing Company; 2000:450-510.
7. Sara A, Francesca C, Angelo C, Vincenzo P. Congenital Malformations in River Buffalo (*Bubalus bubalis*) Animals. 2017;9:1-15.
8. Badawy AM. Some congenital malformations in ruminants and equines with special reference to the surgical treatment of rectovaginal and cysto-rectal fistulae. *Benha Vet Med J.* 2011;1:14-27.
9. Ademuni RBD, Fale MS, Usman B, Lawal M. Retrospective study of atresia ani cases presented at Ahmadu Bello University Zaria, Nigeria. *NVJ.* 2007;28(1):48-56.
10. Hossain MB, Hashim MA, Hossain MA, Sabrin MS. Prevalence of Atresia ani in new born calves and their surgical management. *Bangl J Vet Med.* 2014;12:41-5.
11. Shakoore A, Muhammad SA, Younus M, Kashif M. Surgical repair of congenital recto-vaginal fistula with atresia ani in a cow-calf. *Pakistan Vet J.* 2012;32:298-300.
12. Bodinga HA, Nura A, Shehu S, Yakubu AS, Abubakar AA. Surgical management of Type 1 Atresia ani in new born Lamb: a case report. *Int J Res Scientific Innovation.* 2019;9:202-4.
13. Gangwar AK, Khangembam SD, Singh AK, Nitesh K, Ghanshyam P, Sushanta S. Surgical Correction of Congenital Anomalies. *Advances Animal Veterinary Sci.* 2014;2:369-76.
14. Smolec O, Kos J, Vnuk D, Stejskal M, Bottegaro NB, Zobel R. Multiple congenital malformations in a Simmental female calf: a case report. *Veterinari Med.* 2010;55:194-19.
15. Cihan M, Atalan G, Ozba B, Ozaydin I. Treatment of Congenital flexural tendon contracture oxytetracycline administration in calves. *Indian Vet J.* 2004;81:316.
16. Alam MM, Rahman MM. A three years retrospective study on the nature and cause of ocular dermoids in cross-bred calves. *Open Vet J.* 2012;2:10-14.
17. Roh YS, Gi DB, Lim CW, Kim B. Asymmetrical ocular dermoid in native Korean cattle. *J Anim Plant Sci.* 2014;24:976-8.
18. Kilic N, Toplu N, Epikmen ET. Surgical treatment of corneal large dermoid in a Simmental calf. *Acta Sci Veterinary.* 2012;40:1041.
19. Simon S, William MJB, Velvan, Kannan TA, Kumar RS. Ocular dermoid in calves and its surgical management: a review of five cases. *Indian J Field Vet.* 2010;6(1):69-70.
20. Bozzo L, Almedia OP, Scully C, Aldred MJ. Hereditary gingival fibromatosis. Report of an extensive four-generation pedigree. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 1994;78:452-4.
21. Fletcher JP. Gingival abnormalities of genetic origin: preliminary communication with special reference to hereditary gingival fibromatosis. *J Dent Res.* 1966;45:597-612.

22. Hemini S, Mala DB, Bhavin G. Hereditary Gingival Fibromatosis: a case report. *Int J Res Sci.* 2006;5:1064-7.
23. Cholakis KA, Wiltshire WA, Birek C. Treatment and Long-term Follow-up of a Patient with Hereditary Gingival Fibromatosis: A Case Report. *Canadian J Dent Assoc.* 2002;68:290-4.
24. Mason C, Hopper C. The Use of CO2 Laser in the Treatment of Gingival Fibromatosis: A Case Report. *Int J Paediatr Dent.* 1994;4:105-9.

Cite this article as: Bodinga HA, Nura A, Faruku B, Abubakar AA, Yakubu AS, Atabo SM, et al. Congenital malformations in ruminants and its surgical management: a retrospective study of Sokoto veterinary clinic, Nigeria. *Int J Sci Rep* 2020;6(7):248-52.