

*Case Report*

**CLINICAL MANAGEMENT OF HYDRALLANTOIS DUE TO FETAL  
MENINGOCELE IN A NON DISCRITIVE COW**

**Prabaharan V<sup>1</sup>, Sukumar, M<sup>2</sup>, Jayaganthan P<sup>1</sup>, Raja S<sup>1</sup>, Rajkumar R<sup>1</sup> and  
Palanisamy M<sup>3</sup>**

<sup>1</sup>Assistant Professor, <sup>2</sup>Student, <sup>3</sup>Professor  
Department of Veterinary Gynaecology and Obstetrics,  
Veterinary College and Research Institute,  
Tamil Nadu Veterinary and Animal Sciences University,  
Orathanadu, Tamilnadu – 614 625  
E-mail: kullupraba@gmail.com

**Abstract:** A rare case of hydrallantois in six years old pleuriparous non-descriptive cow of second parity was presented to Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu, with the history of artificially inseminated 6 months back and now the animal is having bilateral abdominal distension and respiratory distress for past 10 days. On clinical examination, the cow had severe abdominal distension (circumference - 83 inches), with cardio-respiratory alteration. Rectal examination revealed distended uterus with fluid and placentomes could not be detected with normal fremitus. Based on clinical examination the case was diagnosed as hydrallantois. Hence the pregnancy was terminated using inj. Cloprostenol (500 mcg, i/m) and inj. Dexamethasone (40 mg, i/m). To avoid hypovolemic shock and to withdraw the allantoic fluid slowly, transcervical allantocentesis was done with a Rusch catheter (18”) which was fixed at the level of internal os and the fluid was evacuated for the duration of 15 hours slowly. Further examination revealed a dilated cervix and dead immature defective female fetus with meningocele was derived by per vaginum. The cow was clinically treated with antibiotic, antihistamine and intravenous fluids for four day and recovered uneventfully.

**Keywords:** Cow, Hydrallantois Meningocele, Rusch catheter.

## I. INTRODUCTION

Hydrallantois is a pathological condition affecting pregnant uterus characterized by a rapid accumulation of watery, amber colored fluid inside the allantoic cavity over a period of 5 to 20 days in late gestation (Morrow, 1986). It has been commonly reported to occur in bovine, Bubaline, equine and rarely in ovine, canine and caprine (Milton *et al.*, 1989; Kumar *et al.*, 2012 and Feliciano *et al.*, 2013).

It is usually related with a diseased uterus in which most of the caruncles in one horn are not functional and rest of the placentomes are greatly enlarged and possibly diseased (Roberts, 1971). A reduction in the number of cotyledons has also been associated with hydrallantois (Peek, 1997). Decreased active transport of sodium across the chorioallantoic membrane,

increased permeability of the chorioallantoic membrane, hormonal imbalances, fetal renal disease (Morin *et al.*, 1994), multiple fetuses in the uterus, fetal liver disease, uterine torsion and/or twisting of the umbilical cord, deficiency of vitamin A causing decreased endometrial resistance to infections (compromises the number of caruncles) Malnutrition conditions and heart or renal diseases of the ewe (Toniollo and Vicente, 1993) may contribute to this process.

Meningocele is the sac like protrusion of the meninges filled with cerebrospinal fluid through a defect in the skull (Urman, 1983). In addition to the skull, meningocele may also occur in cervical (Alkan *et al.*, 1995), thoracic and lumbar vertebrae (Rivas *et al.*, 1996). Meningocele forms a hernial cyst that is filled with cerebrospinal fluid but does not contain neural tissue. By contrast, meningoencephalocele is the hernial protrusion of the meninges and brain tissue through a defect (cranium bifidum) in the cranium (Urman 1983 and Hoogmoed *et al.*, 1999). The formation of meningoencephalocele has been reported in domestic animals, i.e., calves (Raofi *et al.*, 2004), lambs (Back *et al.*, 1991), dogs (Sponenberg and Graf-Webster 1986), and foals (Erturk and Samsar 1978). Although strain and gender have not been reported in general to be a predisposing factor for the development of congenital defects in cattle, the ratio of congenital defects among Brown Swiss cattle is reported to be higher (Belge *et al.*, 2000).

Hydrallantois is usually treated by terminating the pregnancy using prostaglandin F<sub>2α</sub> and corticosteroids (Manokaran *et al.*, 2011) but the sudden removal of allantoic fluid leads to hypovolemic shock and collapse of the animal (Peiro *et al.*, 2007). The clinical case of hydrallantois with menigocele fetus and its successful management in a non-descript cow presented in this report.

## II. CASE HISTORY AND OBSERVATION

A rare case of hydrallantois in six year old pleuriparous non-descriptive cattle of second parity was presented to Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu, with the history of artificially inseminated 6 months back and now the animal is having bilateral abdominal distension and respiratory distress for past 10 days. The animal was 6 months pregnant and the general examination reveals the rectal temperature of 37.5° C, respiration rate of 26/min, heart rate of 88/min, bilateral distension of abdomen with an abdominal circumference of about 83 inches (Fig. 1). The vaginal examination revealed the cervix was closed and patent vaginal passage. The rectal examination showed fluid filled uterus with difficulty in palpating the fetus, placentomes not palpable and the fremitus is

about three plus. The cow had stiff and slow gait and had difficulty in walking. Based on the history and observation, the case was diagnosed as hydrops and it was decided to perform allantocentesis to remove the excessive allantoic fluid and also to terminate the pregnancy.

### III. TREATMENT

The animal was stabilized with the administration of inj. DNS (3 lit, i/v) and the pregnancy was terminated with Cloprostenol sodium (500 $\mu$ g, i/m) and Dexamethasone (40mg, i/m) the intravenous fluids were continued at 12 h interval for 3 days. To avoid hypovolemic shock and to withdraw the allantoic fluid slowly, a Rusch catheter (18") was fixed at the level of internal os of cervix by piercing allantoic bag and the balloon was inflated with 10 ml air. After 36 hours after induction around 88 litres of allantoic fluid came out and the abdominal distension got reduced. After 72 hours totally 147 liters of allantoic fluid (Figure 6) came out and the cervix was fully dilated, by manual traction an anteriorly presented dead male fetus with meningocele was delivered (Figure 3). The fetus weight is about 5.150 kg (Figure 4). and the placenta weight is about 1.300 kg (Figure 5). The placenta was oedematous and leathery and fastly adhered to the caruncles. The maternal caruncles were enlarged and larger in size and some of them were small. After delivery of the fetus, the abdomen size of the cow was reduced about 13 inches circumference ie. about 70 inches. The cow was administered with Inj. Ringers lactate (7 lit, i/v), Inj. DNS (5 lit, i/v), Inj. RL (2 lit, i/v) Inj. Calcium borogluconate (450 ml, i/v), Inj. Oxytocin (40 IU), Inj. Endroflacin (1200 mg, i/m), Inj. Meoxicam (15 ml, i/m) and Inj. Chlorpheniramine maleate (225 mg, i/m) for 5 days and the dam recovered uneventfully.

### IV. DISCUSSION

Hydrallantois is caused by structural or functional changes in the allantoic chorion including its vessels with transudation and collection of fluid, differing from normal allantoic fluid but resembling plasma. The cause of hydrallantois is not certain. A reduction in the number of cotyledons has also been related with hydrallantois (Peek, 1997). Hydrallantois could usually be associated with a diseased uterus in which most of the caruncles in one horn were not functional and atrophied and rest of the placentomes were enlarged, edematous and possibly diseased which led to formation of adventitious placenta (Drost, 2007 and Selvaraju *et al.*, 2012). The polyurea resulted from the hydronephrosis of fetal kidneys was also a cause for excessive accumulation of the fluid inside the allantoic cavity. Decreased active transport of sodium across the chorioallantoic membrane, hormonal imbalances increased permeability of the chorioallantoic membrane, multiple foetus in the uterus, fetal liver disease, fetal renal

disease, uterine torsion or twisting of the umbilical cord, deficiency of vitamin A causing decreased endometrial resistance to infections, malnutrition conditions and heart or renal diseases may contribute the hydroallantois process (Morin *et al.*, 1994).

Hydrallantois must be differentiated from Hydramnions, intestinal obstruction, ascites, rupture of bladder, abdominal masses like tumour, abscess or fat necrosis, rumen tympany, extensive ventral edema, hydrometra and multiple foetuses (Morin *et al.*, 1994). The management of hydrallantois case varies with the period and severity of the condition. It may be undiagnosed until the time of abortion in mild cases, premature birth or at normal parturition. Excessive volume of fluid is observed accompanied by the presence of a poorly viable, small or defective fetus.

Increased hydraulic pressure on diaphragm due to massive abdominal enlargement causes difficulty in breathing there by treatment should be directed towards evacuation of uterus and termination of pregnancy by use of prostaglandins or caesarean. If a large volume of allantoic fluid in the uterus is expelled rapidly, circulatory shock can develop (Misri, 2001). Bhattacharyya *et al.* (2012) and Morin *et al.* (1994) preferred caesarian section for relieving severe abdominal discomfort and respiratory distress.

Genetic factors, certain medicines used during pregnancy, and abnormal interventions during rectal examinations can play a congenital meningocele role in the development cranial defect and malformations (Alkan *et al.*, 1995). In the present case, medical history revealed that the dam had not been exposed to any kind of toxicants, received any kind of medicines, or suffered from high fevered disease and gave to a normal birth without help. Therefore, genetic factors are considered to have played role in the formation of the current defect in the calf. Autosomal recessive genes are known to control the formation of congenital defects (Hoogmoed *et al.*, 1999, Alkan *et al.*, 1995). The use of bulls with known healthy pedigree in artificial insemination is critical. Therefore, inspection of mother and inseminating bull for genetic defects will help us to prevent or reduce the incidence of congenital malformations. Most fetuses of animals with hydrallantois are under developed with congenital defects or are apparently normal but not viable (Milton *et al.*, 1989, and Morin *et al.*, 1994). The post mortem examination of the fetus reveals no abnormalities in vital organs except the meningocele on the thoracic region and histopathology smear is not clear due to autolytic changes in the internal organs (Figure 5).

The allantocentesis performed with Rusch catheter was helped to remove the excessive allantoic fluid in a slow manner. It was essential that the fluid should be allowed to escape

slowly so as to prevent the occurrence of hypovolemic shock associated with splanchnic pooling of blood. At the same time to avoid shock due to sudden expulsion of allantoic fluid, transcervical allantocentesis was performed with Rusch catheter (Manokaran *et al.*, 2011). Simultaneous fluid replacement through intravenous route helped to avoid the shock due to fluid loss. Various methods to induce parturition in cattle suffering from hydrallantois were reported in the literature including use of natural or synthetic PGF<sub>2</sub> $\alpha$  preparation (Manokaran *et al.*, 2011) and estrogen preparations (Peiro *et al.*, 2007). The common sequelae of hydrallantois are septic metritis and retention of fetal membranes immediately after fetal delivery.

In conclusion, determination of the factors causing the congenital anomalies becomes impossible since they are numerous such as malnutrition, exposed diseases, applied medicines, and growing conditions. The present case classified as meningocele in hydrallantois condition of a fetus may be due to the congenital anomalies of the fetus lead this condition. This findings were co-inside with the findings of the Milton *et al.*, 1989, and Morin *et al.*, 1994. Further we concluded that current report will illuminate on the further similar studies on the congenital anomalies.

### **Acknowledgement**

Authors thank the Dean, Veterinary College and Research Institute, Orathanadu for the facilities provided.

### **References**

- [1] Alkan I, Bakır B, Dilek FH, Belge A, (1995). İki Akkaraman kuzuda meningoensefalosel olgusu. *YYU Sag Bil Derg*, 1, 71-75.
- Aslanbey D, Öcal MK, Kutsal O, Unsaldı E, 1989. İki kuzuda rastlanan meningocele ve meningoencephaloccele olgular. *AÜ Vet Fak Derg*, 36, 379-389.
- [2] Back W, van den Belt AJ, Lagerweij E, van Overbeeke JJ, van der Velden MA, (1991). Surgical repair of a cranial meningocele in a calf. *Vet Rec*, 128, 569-571.
- [3] Bhattacharyya, H.A., S.H. Dar, M.R. Fazili and A. Hafiz, (2012). A Typical Case of Hydrallanto is accompanied by Fetal Monstrosity in a Local Ewe of Kashmir. *Veterinary Research Forum*.3: 221 – 223.
- [4] Belge A, Gonenci R, Biricik HS, Ormancı S, (2000). Buzagılarda dogmasal anomali olguları. *YYU Vet Fak Derg*, 11, 23-26.
- [5] Drost, M. (2007). Complications during gestation in the cow. *Theriogenology*, 68: 487.

- [6] Feliciano, M.A.R., D.J. Cardilli, R.M. Crivelaro, E. Garrido, M.A. M. Silva, T.L.L. Castanheira and W.R.R Vicente, (2013). Hydrallantois in a female dog: a case report. *Arquivo Brasileiro de Medicina Veterinária e Zootecnia*, 65: 1091-1095.
- [7] Hoogmoed LV, Yarbrough TB, Lecouteur RA, Hornof WJ, (1999). Surgical repair of a thoracic meningocele in a foal. *Vet Surg*, 28, 496-500.
- [8] Kumar, S., U. Sharma, A.K. Pandey, S. Agarwal, R.B. Kushwaha and A.K. Tripathi, (2012). Hydroallantois in Buffalo: A Case Report. *Buffalo Bulletin*.31: 67-69.
- [9] Manokaran, S., Ravikumar, K., Ezakial Napoleon, R., Palanisamy, M. and Selvaraju, M. (2011). Hydrallantois in a non-descript buffalo: A case report. *The Indian Journal of Field Veterinarians*, 7: 69.
- [10] Milton, A., B. Welker and P. Modransky, (1989). Hydrallantois in Ewe. *J. Am. Vet. Med. Assoc.*, 195:1385-86.
- [11] Misri, J., (2001). Hydrallantois in a goat. *Indian Veterinary Journal*, v.78, p.255-256.
- [12] Morin, D. E., T. Hornbuckle, L. L. Rowan and H. E. Whiteley, (1994). Hydrallantois in a caprine doe. *Journal of American Veterinary Medical Association*, 204:108-111.
- [13] Morrow, A.D. (1986). *Current Therapy in Theriogenology*. WB Saunders Company,
- [14] Peek, S. F. (1997). Dropsical conditions affecting pregnancy. In: Youngquist, R. S. *Current Therapy in Large Animal Theriogenology*. 1ed., W.B. Saunders, 400-403.
- [15] Peiro, J, R., Borges, A.S., Yanaka. R., Koivisto, M.B., Mendes, L.C.N., Feitosa, F.L.F., Abujamra, J.O. and Rodrigues, C.A. (2007). Hydrallantois in an ewe (Case report). *Ars Veterinaria*, 23: 116-119.
- [16] Peiró, J. R., A.S. Borges, R. Yanaka, M.B. Koivisto, L.C.N. Mendes, F.L.F. Feitosa, J.O. Abujamra, C.A. Rodrigues, (2007). Hydrallantois in ewe (Case Report). *Ars Veterinaria, Jaboticabal*, 23:116-119.
- [17] Raofi A, Dehghan MM, Mardjanmehr SH, Soroori S, Hemmatzadeh F, Lotfollahzadeh S, Nekoei SH, (2004). Cranium bifidum with meningocele in a lamb. *Small Rumin Res*, 55, 253-256.
- [18] Rivas LJ, Hinchcliff KW, Robertson JT, (1996). Cervical meningocele associated with spina bifida in a hydrocephalic miniature colt. *J Am Vet Assoc*, 209, 950-953.
- [19] Roberts, S.J. (1971). *Veterinary Obstetrics and Genital Diseases*. CBS Publishers and Distributors, New Delhi, India. pp. 180-183.
- [20] Selvaraju, M, Manokaran, S, Palanisamy, M, Ezakial Napoleon,R and Ravikumar, K. (2012). Hydrallontois in a she buffalo. *Indian J. Ani. Reprod.*, 33: 92-93.

[21] Toniollo, G.H. and W.R.R. Vicente, (1993). Manual de Obstetricia Veterinaria. 1ed., Sao Paulo, Livraria Varela.

[22] Urman H.K, (1983). Sinir sistemi, In: Evcil Hayvanların Özel Patolojik Anatomisi, Ankara Universitesi Basimevi, Ankara, Turkiye, pp; 19.



Fig 1. Hydrallantois cow before treatment



Fig 2. Hydrallantois cow after treatment



Fig 3. Fetus with meningocele

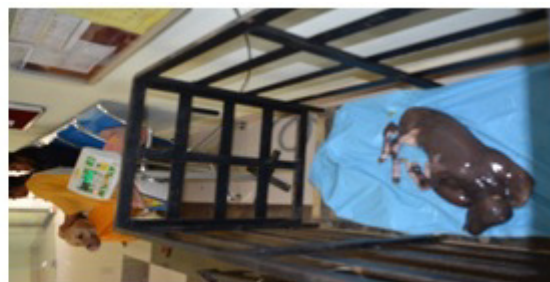


Fig 4. Weighing of the fetus



Fig 5. Weighing of the placenta

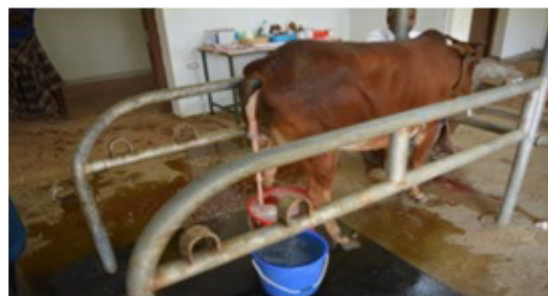


Fig 6. Weighing of the allantoic fluid



Fig 7. Post mortem examination of the fetus