



Research Journal of
**Veterinary
Sciences**

ISSN 1819-1908



Academic
Journals Inc.

www.academicjournals.com

Esophageal Obstruction in Young Camel Calves (*Camelus dromedarius*)

A.F. Ahmed

Department of Veterinary Medicine, Veterinary Teaching Hospital, College of Agriculture and Veterinary Medicine, Qassim University, Buraydah 51452, P.O. Box 6622, Al-Qassim, Kingdom of Saudi Arabia

ABSTRACT

The objectives of this study were to describe the causes and clinical findings of esophageal obstruction and to assess its surgical treatment in young camel calves. Eight cases of esophageal obstruction in young single-humped camel calves were subjected to clinical study, diagnosis, surgical treatment and more than 6 month-follow-up period. Age of camel calves ranged from 14 to 55 days. Cause of esophageal obstruction was the ingestion of foreign objects which were mainly plastic bags and sheets. The site of obstruction was just caudal to the thoracic inlet. Stomach tubing was a feasible diagnostic tool for the obstruction and its site. Contrast radiography was confirmative. Esophagotomy was successful treatment option of esophageal obstruction in camel calves.

Key words: Esophagus, thoracic, camels calves, esophagotomy

INTRODUCTION

Camel esophagus is a long tube of large capacity, in camel it can be 1 to 2 m long. It is lined by glands which secrete mucus helping to lubricate the often rough forage consumed by the camel (Nabipour *et al.*, 2001; Al-Ani and Qureshi, 2004). Esophageal obstruction or “choke” is a common clinical presentation in the horse (Hillyer, 1995; Feige *et al.*, 2000; Chiavaccini and Hassel, 2010) and cattle (Smith, 2008). It is most frequently caused by feed impaction in horses (Hillyer, 1995) and ingestion of foreign objects or feedstuff, administration of medicated boluses, trichobezoars or esophageal granulomas in cattle (Patel and Brace, 1995; Smith, 2008).

Esophageal obstructions in large animals commonly occur at the cranial aspect of the cervical esophagus, at the thoracic inlet, at the cardia or at the base of the heart (Misk *et al.*, 2004; Smith, 2008). Intraluminal obstruction is the most common abnormality. Conservative and surgical treatments are used to relieve esophageal obstruction (Misk *et al.*, 2004; Smith, 2008; Hass, 2010).

There are few published studies describing the clinical findings and treatment in camels with esophageal obstruction and these mainly included smaller numbers of camels (Ramadan and Abdin-Bey, 1990; Kuldeep *et al.*, 2000; Dabas *et al.*, 2002; Prem, 2010). Available literatures lack information about esophageal obstruction in young camels except one case report (Ramadan *et al.*, 1986b).

The aim of the current study was to describe the causes and clinical findings and to assess surgical treatment of esophageal obstruction in young camel calves.

MATERIALS AND METHODS

Animals: Eight cases of esophageal obstruction in young single-humped camel calves were presented to the Veterinary Teaching Hospital, College of Agriculture and Veterinary Medicine, Qassim University during the period from September, 2009 to July, 2010.

Data collection: Young camels with esophageal obstruction were subjected to clinical study including breed, age and sex of the animal, the history of the case, clinical signs, diagnosis by stomach tubing and contrast radiography, surgical treatment, postoperative care and over 6 months-follow-up of the cases telephonically. Camel calves with esophageal obstruction (n = 8) were of 4 local breeds; Maghateer or Wodh (n = 3), Majaheem (n = 2), Ashaal (n = 2) and Asfar (n = 1). They were 3 males and 5 females. Age of camel calves ranged from 14 to 55 days (median = 32.5 days) with body weight ranged from 32 to 58 kg (median = 41 kg). Plain and contrast radiography using barium sulfate (150-200 mL) was carried out in 4/8 cases.

Manipulative treatment: After sedation of the animal by intravenous injection of 0.2 mg kg⁻¹ body weight of xylazine HCl (Seton, 2%, Laboratorios Caler, S.A., Barcelona, Spain), efforts were made to push the obstructing object to the rumen by a stomach tube but failed. Further efforts were stopped because of the fear of esophageal perforation.

Surgical treatment: Sedated young camel was positioned in right lateral recumbancy. A stomach tube was placed to the level of obstruction. The neck near the thoracic inlet was prepared for aseptic surgery. Linear analgesia using 2% lidocaine (Norbrook Laboratories, UK) at a dose rate of 10 mg kg⁻¹ was infiltrated at the site of operation. A linear skin incision was made at the ventrolateral aspect of the neck as caudal as possible. Muscles of the neck were bluntly dissected to approach the esophagus. Two stay sutures were placed through esophageal wall before making incision to open its lumen. A long sponge forceps was advanced aborally through the esophageal wound to grasp and extract the cause of obstruction (Fig. 2b, c). Esophageal wall was then sutured in two layers with Polydioxanone (PDS) no. 00 (PDS; Ethicon, UK) using simple continuous suture pattern. The mucosa and submucosa was the first layer and the muscosa with adventitia were the second one. Surgical site was flushed with sterile normal saline and cervical muscles were sutured in simple continuous pattern by PDS no.1. Skin was then sutured by polypropylene (Ethicon, UK) or silk suture (Lukens Medical, USA) no. 1 and simple interrupted stitches.

Each animal was given postoperative therapy with penicillin-streptomycin at a dose rate of 30,000 IU kg⁻¹ for the penicillin and 10 mg kg⁻¹ streptomycin for 5 days (Norbrook Laboratories, UK). Phenylbutazone (Phenylarthritis, Vetoquinol, LURECEDEX, France) at a dose of 4.4 mg kg⁻¹ was given intramuscularly for 3 days. Dextrose 5% in normal saline (2-3 L) was given IV one day postoperatively. Food was withheld for 24 h postoperatively then young camels were allowed to suckle camel milk. Roughages were introduced gradually from day 7 postoperatively.

RESULTS

Body temperature of camel calves on admission ranged between 35.6 and 37.5°C (median = 36.4°C). The heart rate and respiratory rate ranged between 35 and 57 beats min⁻¹ and 8-12 breaths min⁻¹, respectively (median 44 beats min⁻¹ and 10.5 breaths min⁻¹, respectively). Clinical signs were sudden onset of dysphagia, regurgitation of fluids and milk (Fig. 1a) immediately after suckling and salivation. These symptoms appeared 2 to 5 days (median = 3 days)

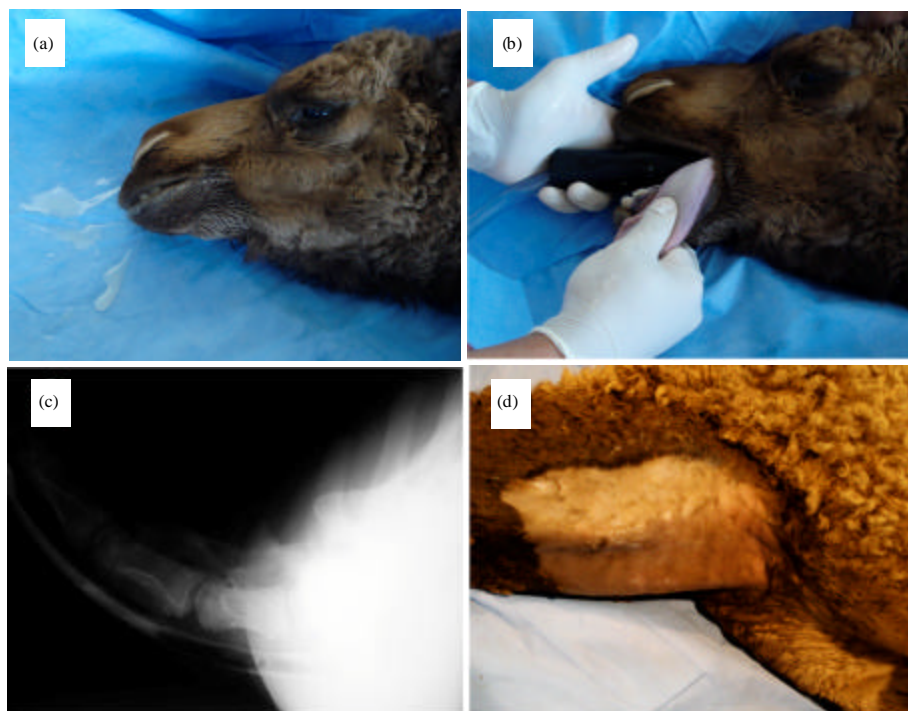


Fig. 1: (a) Regurgitation of saliva and fluids in a 30 day-old female Majaheem camel calf, (b) oro-pharyngeal insertion of stomach tube for diagnosis of esophageal obstruction in the same case in a, (c) contrast radiography using barium sulfate for the diagnosis of esophageal obstruction in a 35-day old male Maghateer camel calf and (d) the site of esophagotomy operation prepared

before admission to the clinic. Diagnosis was made on history, clinical signs and stomach tubing (Fig. 1b). Stomach tubing revealed that the obstructions were complete and caudal to the thoracic inlet by approximately 6 to 15 cm (median = 12 cm). Plain radiography failed to visualize the site and cause of obstruction at the cranial thoracic region. Contrast radiography confirmed the diagnosis of obstruction (Fig. 1c). Intervention to push the obstructing object towards the rumen failed and led to esophageal perforation in one case that died 10 min after the trial.

Surgical treatment by cervical esophagotomy at the most caudal part of the neck (Fig. 1d) was successful in extraction of the cause of obstruction in 6/7 cases. Insertion of the stomach tube to the level of obstruction facilitated exposure and incision of the deep seated esophagus (Fig. 2a). A stomach tube through the esophagotomy incision towards the rumen pushed the obstruction in one case. In this case, trials to retrieve the cause of obstruction through the esophagotomy failed and the obstruction mass was pushed towards the rumen. Extracted foreign objects were plastic bags (Fig. 2d-f) alone (n = 2), plastic bags with accumulated food materials (n = 1), plastic sheets (n = 2) and piece of cloths (n = 1) (Fig. 2e-g).

Long term (over 6 months) follow up of the cases revealed complete recovery and absence of complications at the esophagotomy site in all cases.

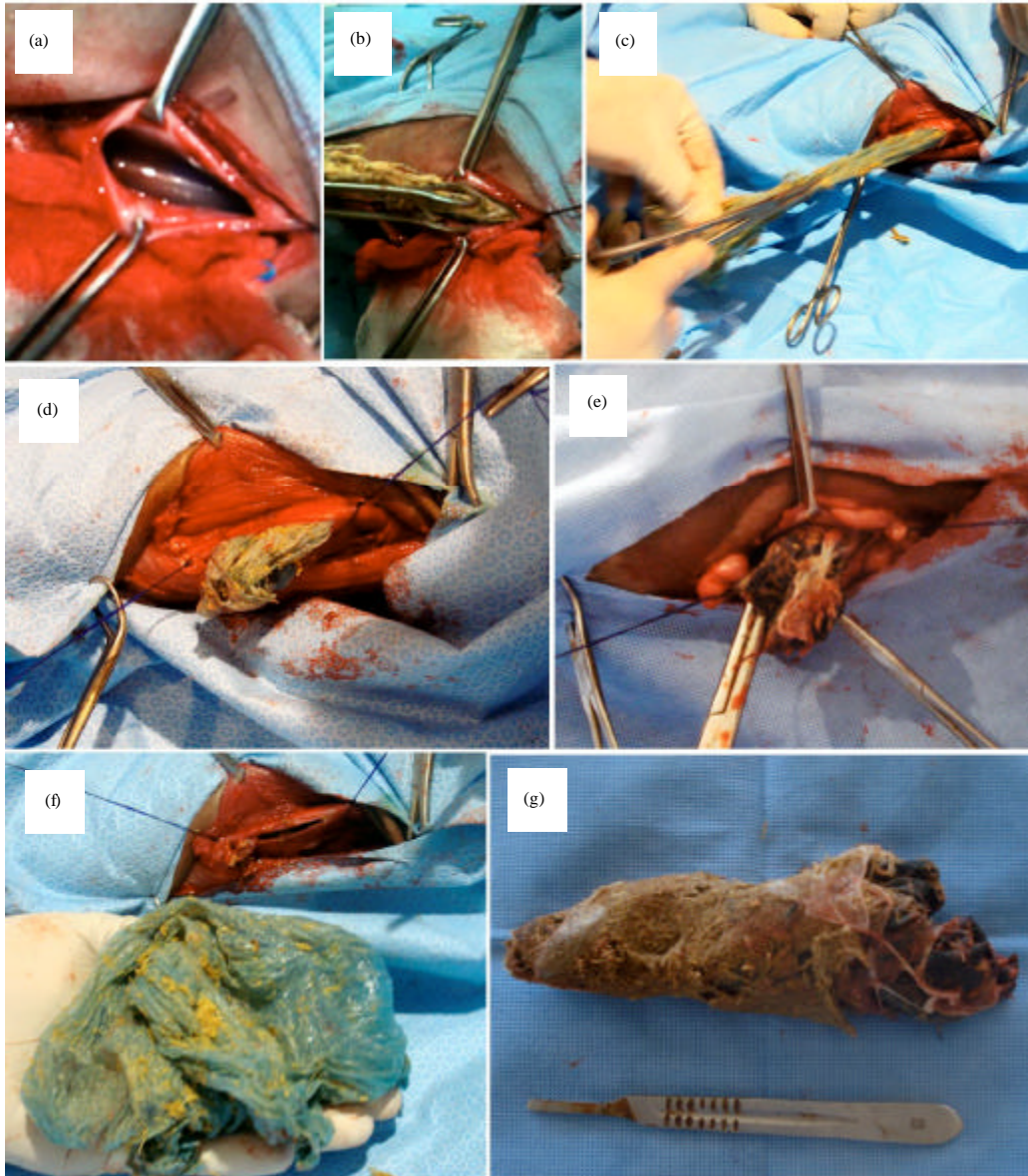


Fig. 2: (a) Stomach tube was inserted to facilitate esophagotomy and appeared in the lumen, (b) a sponge forceps was used to grasp and extract the cause of obstruction, (c) a plastic bag was extracted from a 45 day-old female Ashaal camel calf, (d) a plastic bag appeared at the esophagotomy incision, (e) a piece of cloths appeared at another esophagotomy site of a 55 day-old female Ashaal calf, (f) the plastic bag after its extraction and (g) the piece of cloths after its extraction, note feed stuffs with the cloths

DISCUSSION

Cause of esophageal obstruction in young camel calves was the ingestion of foreign objects which were mainly plastic bags and sheets. The site of obstruction was just after the thoracic inlet.

Esophagotomy was successful treatment option in camel calves. Esophageal obstruction in camels has been reported to be incomplete or complete (Fowler, 2010). Results here revealed that all cases were of complete obstruction in camel calves. This result is supported by another study which revealed that any foreign body that becomes lodged in the esophagus will initiate muscular contractions with the purpose of moving the object one way or the other. If neither peristaltic nor antiperistaltic action is effective, the end result may be a spasm on either side of the obstruction that complicates the situation further and which may turn a partial into a complete obstruction (Guffy, 1975; Weldon, 1993; Goddard and Fraser, 1994; Smith *et al.*, 2008). The exact reason for initiation of a spasm causing an obstruction has not been entirely known (Fowler, 2010).

Ingestion of plastic bags and sheets as well as cloths was found to be the main cause of obstruction in young camel calves. Environmental pollution with plastic products facilitated their availability to camels in the desert with their subsequent ingestion. Foreign bodies such as food particle, plastic bags, rags, plastic balls and cloths have been recorded to be the main cause of esophageal obstruction in adult camels (Ramadan and Abdin-Bey, 1990). Ingestion of apples in llama, peri-esophageal hematoma and neural dysfunction has been reported to cause esophageal obstruction in camelids (Weldon, 1993; Fowler, 2010). The object may be lodged in either the cervical or thoracic portion of the esophagus (Ramadan *et al.*, 1986a, b). In young calves, a case of cervical esophageal obstruction caused by a segment of plastic tube has been reported in a 2 day-old cattle calf (Hass, 2010). The obstruction was easy to manipulate towards the rumen and extracted through a laparorumenotomy operation that was a different treatment from the current study. A similar case has been reported in a camel calf (Ramadan *et al.*, 1986b).

These foreign objects were found lodged just after the thoracic inlet of calves in the present study. At this site the esophagus changes its course from left dorsolateral aspect of the trachea to be completely dorsal to the latter (Smuts *et al.*, 1987). This sudden change in the course of the esophagus might predispose it for obstruction at this site. In younger cattle the obstruction occurs commonly at the thoracic inlet but may also occur in the upper esophagus or over the base of the heart (Church *et al.*, 1972; Misk *et al.*, 2004). The latter site has especially been common in older cattle (Church *et al.*, 1972).

Although esophageal obstruction was complete in the present study, the only clinical findings noticed were dysphagia and regurgitation of fluids and milk. The physical parameters of calves were within normal range.

Oro-pharyngeal insertion of the stomach tube to the esophagus was diagnostic of esophageal obstruction in the current study. By simple measurement, the site of obstruction can be easily determined. Diagnosis has been reported to be based upon consideration of the history, clinical signs and passage of stomach tube would indicate the position of the lesion in camels (Al-Ani and Qureshi, 2004; Fowler, 2010). Similar diagnostic considerations have been reported in cattle (Meagher and Mayhew, 1978; Haven, 1990; Patel and Brace, 1995; Smith, 2008) and horse (Feige *et al.*, 2000). Plain radiography failed to determine the site of obstruction in this study because of the superimposition with shoulder regions and the radiolucency of the foreign objects. However, Contrast radiography was confirmative. It has been reported that radiography of the cervical region is straightforward and barium contrast radiography has proved useful in the diagnosis of esophageal foreign bodies in the juvenile camel (Ramadan *et al.*, 1986b) and cattle (Haven, 1990; Niehaus, 2008).

Several treatment options for esophageal obstruction have been cited. They have included medical or manipulative and surgical treatments (Church *et al.*, 1972; Smith, 2008; Fowler, 2010).

Various medical treatments have been described for the management of esophageal foreign bodies in ruminants. The objective is either to advance the object aborally so that it passes into the rumen or to manipulate the foreign body so that it can be extracted orally. The site of obstruction was currently caudal to the thoracic inlet that rendered the orally directed manipulation of the obstruction unfeasible. Moreover, esophageal spasm over the complete obstruction resulted in difficulty in advancement of the foreign object aborally in the current study. One camel calf died just after using stomach tubing in a manner to relieve the obstruction in this study. Necropsy findings of this calf was not available because the owner refused to do so. It has been reported that vigorous efforts to dislodge the obstruction with such instruments usually result in rupture of the esophagus and subsequent death of the animal (Church *et al.*, 1972).

Surgical treatment of esophageal obstruction has been reported to be warranted if the animal is economically valuable and if medical treatment fails (Meagher and Mayhew, 1978; Trent *et al.*, 2004). In this study, caudal cervical esophagotomy was used successfully to extract the cause of obstruction. All cases had complete recovery without long-term follow-up complications. Although esophagotomy has been indicated if the object is embedded within the cervical esophagus (Meagher and Mayhew, 1978; Wilmot *et al.*, 1989), it was also suitable in cases of cranial thoracic esophageal obstruction in the present study. However, the risk of post-operative complications associated with an esophagotomy such as incisional dehiscence, stricture formation, cellulitis, esophageal diverticulum, anorexia with failure to gain weight and fistula formation must be considered if pursuing this course of treatment (Church *et al.*, 1972; Haven, 1990; Ruben, 1977; Smith, 2008). Similar results of uncomplicated esophagotomy have been recorded in cattle and buffaloes (Meagher and Mayhew, 1978; Misk *et al.*, 2004).

The prognosis has been cited to be good for animals suffering from esophageal obstruction if they are treated within 2 to 12 h from the onset of clinical signs (Church *et al.*, 1972; Smith, 2008). Prognosis worsens for those animals that are not identified within 24 to 48 h from the time of obstruction (Hass, 2010). Moreover, death has been cited to occur in two to three weeks in adult ruminants due to inflammation and necrosis with subsequent stricture formation, anorexia and respiratory compromise (Church *et al.*, 1972). Although camel calves in the present study had esophageal obstruction for 3 to 5 days, the outcome of treatment was satisfactory.

CONCLUSION

Esophageal obstruction was complete in camel calves and caused by ingestion of foreign objects mainly plastics. The predilection site of obstruction was just caudal to the thoracic inlet. Esophagotomy was successful surgical treatment.

REFERENCES

- Al-Ani, F.K. and A.S. Qureshi, 2004. The Digestive System. In: Camel Management and Diseases, Al-Ani, F.K. (Ed.). Al-Sharq Printing Press, Jeddah, pp: 197-218.
- Chiavaccini, L. and D.M. Hassel, 2010. Clinical features and prognostic variables in 109 horses with esophageal obstruction (1992-2009). *J. Vet. Int. Med.*, 24: 1147-1152.
- Church, T.L., J.E. Niwa and G.R. Clark, 1972. The use of Thygesen's probing in the treatment of bovine esophageal obstruction due to sugar beets. *Can. Vet. J.*, 13: 226-227.
- Dabas, V.S., S. Chaudhary, J.N. Mistry, K.P. Singh and S. Chaudhary, 2002. Oesophageal obstruction in a camel. *Indian J. Anim. Res.*, 36: 78-78.
- Feige, K., C. Schwarzwald, A. Furst and B. Kaser-Hotz, 2000. Esophageal obstruction in horses: A retrospective study of 34 cases. *Can. Vet. J.*, 41: 207-210.

- Fowler, M.E., 2010. Digestive System. In: *Medicine and Surgery of Camelids*, Fowler, M.E. (Ed.). 3rd Edn., Blackwell Publishing Co., USA., pp: 351-402.
- Goddard, P.J. and M.D. Fraser, 1994. Esophageal fistulation in the guanaco. *Small Rumin. Res.*, 13: 287-292.
- Guffy, M.M., 1975. Esophageal Disorders. In: *Textbook of Veterinary Internal Medicine*, Ettinger, S.J. (Ed.). Vol. 2, WB Saunders, Philadelphia, pp: 1101–1104.
- Hass, J., 2010. Esophageal foreign body in a 2-day-old calf. *Can. Vet. J.*, 51: 406-408.
- Haven, M.L., 1990. Bovine esophageal surgery. *Vet. Clin. North. Am. Food Anim. Pract.*, 6: 359-369.
- Hillyer, M., 1995. Management of esophageal obstruction (Choke) in horses. *Practice*, 17: 450-457.
- Kuldeep, S., S. Prem and K. Ashok, 2000. Esophageal obstruction in a camel: An unusual case. *J. Camel Pract. Res.*, 7: 213-213.
- Meagher, D.M. and I.G. Mayhew, 1978. The surgical treatment of upper esophageal obstruction in the bovine. *Can. Vet. J.*, 19: 128-132.
- Misk, N.A., A.F. Ahmed and M.A. Semieka, 2004. A clinical study on esophageal obstruction in cattle and buffaloes. *J. Egypt Vet. Med. Assoc.*, 64: 83-94.
- Nabipour, A.A.G., S. Khanzadi and M.J. Gaasemi, 2001. Anatomical and histological studies of esophagus of one-humped camel. *J. Vet. Res.*, 56: 113-117.
- Niehaus, A.J., 2008. Rumenotomy. *Vet. Clin. North Am. Food Anim. Pract.*, 24: 341-347.
- Patel, J.H. and D.M. Brace, 1995. Esophageal obstruction due to a trichobezoar in a cow. *Can. Vet. J.*, 36: 774-775.
- Prem, S., 2010. Surgical management of esophageal obstruction in camels report of 5 clinical cases. *Proceedings of International Camel Symposium, June 7-11, Garissa, Kenya*, pp: 1-3.
- Ramadan, R.O. and M.R. Abdin-Bey, 1990. Obstruction of the esophagus in camels. *Indian Vet. J.*, 67: 363-364.
- Ramadan, R.O., R.A. Kock and A.J. Higgins, 1986a. Observations on the diagnosis and treatment of surgical conditions in the camel. *Br. Vet. J.*, 142: 75-89.
- Ramadan, R.O., S.A. Razig and O.M. El-Far, 1986b. Esophageal obstruction in a young camel (*Camelus dromedaries*). *Vet. Med. Rev.*, 1: 85-89.
- Ruben, J.M., 1997. Surgical removal of a foreign body from the bovine esophagus. *Vet. Rec.*, 100: 220-220.
- Smith, B., D. Von Pfeil, K. Schulz, E. Klocke, M. Borgarelli and D.E. Anderson, 2008. Unusual cause of esophageal choke: Vascular ring anomaly in an alpaca cria. *Alpacas Mag.*, 18: 168-172.
- Smith, B.P., 2008. *Large Animal Internal Medicine*. 4th Edn., Mosby Publication, St. Louis, Missouri, pp: 804–805.
- Smuts, M.M.S., A.J. Bezuidenhout and D. Mazierski, 1987. The Thorax. In: *Anatomy of the Dromedary*, Smuts, M.M.S., A.J. Bezuidenhout and D. Mazierski (Eds.). Clarendon Press, Oxford, pp: 121-123.
- Trent, A.M., N.G. Ducharme, S.L. Fubini, A. Steiner and G.M. Baxter, 2004. Surgery of the Calf Gastrointestinal System. In: *Farm Animal Surgery*, Fubini, S.L. and N.G. Ducharme (Eds.). Mosby Press, St. Louis, Missouri, pp: 461-484.
- Weldon, A.D., 1993. Identifying a periesophageal hematoma as the cause of choke in a llama. *Vet. Med.*, 88: 1009-1011.
- Wilmot, L., G.S. Jean and G.S. Hoffsis, 1989. Surgical treatment of an esophageal laceration in a calf. *Can. Vet. J.*, 30: 175-177.