



Digestive surgical affections in sheep and goats in state of Kuwait

Khalifah Ali^{1*}, Haithem Ali Mohamed Ahmed Farghali² and Ashraf Ali Eldesoky Shamaa²

¹Public authority for agriculture affairs and fish resources - Kuwait City, Kuwait

²Department of surgery, anesthesiology and radiology, Faculty of veterinary medicine, Cairo University, Egypt

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*Corresponding Author

Khalifah Ali

✉vet-1@live.com

ABSTRACT

Various surgical affections have been recorded in these animals resulting in low productivity and high economic losses. The study was conducted from October 2017 to October 2019 in different farms belonging to Public authority for agriculture affairs and fish resources - Kuwait City, Kuwait. In this study different 96 cases of digestive surgical affections in sheep and goats. Various injuries were recorded and their proportions were as follows- umbilical hernia 27%, rumenotomy due to foreign body in rumen 21%, abdominal hernia 17%, rectal prolapse 11.4%, atresia ani 7%, abomasum displacement 3%, rectal carcinoma 5%, rumen fistula 4%, intestinal prolapse (omphalocele) 2%. On the other hand, the highest infection rate in sheep was 71%, while goats were 28%. In addition to the infection rate of females more than males, where the percentage of females was 68.7% and males were 31%. The surgical affections are common in sheep and goats at Kuwait may cause economic losses and most of these affections are curable.

INTRODUCTION

Sheep and goats are an important part of livestock. In many countries including middle-east Asia, producing milk, meat, hide and wool. Various surgical affections have been recorded in these animals resulting in low productivity and high economic losses (Zabady et al., 2004; Abu-Seida and Ahmed, 2007).

Gastrointestinal surgeries in sheep and goats are not commonly performed by the private veterinary practitioner but should always be considered for individual patients of economic worth. Surgeries that are performed most commonly include drainage or resection of pharyngeal abscess (traumatic, foreign body, caseous lymphadenitis), surgeries of the forestomach (reticulorumen) and abomasum, rumen and esophageal fistula placement, correction of intestinal obstruction, or intestinal accident.

Pharyngeal trauma and subsequent abscess formation in small ruminants is a common finding.

If undiagnosed, this condition can lead to cellulitis, severe tissue necrosis, dyspnea, and subsequent bloat. Radiographs, ultrasound, and endoscopic examination can help confirm and localize the lesion. If the animal is severely dyspneic and the swelling is compressing the trachea, a temporary tracheostomy is indicated. Organisms typically isolated from abscesses include: *Arcanobacterium pyogenes*, *Yersinia pseudotuberculosis*, *Staphylococcus* species, and *Pseudomonas* species. Medical therapy can be attempted, but surgical intervention may be needed if the abscess is large and the animal is symptomatic. If economically feasible, general anesthesia is warranted because of the large number of vital structures in the area, including the vagosympathetic trunk, carotid vasculature, and esophagus.

Diseases of the forestomach (reticulorumen) are fairly common in sheep and goat practice. Ruminal distention, rumen acidosis, rumen impaction, bezoar formation, and foreign body consumption with subsequent impaction and

rumenitis/reticulitis are conditions that may require surgical intervention. Advanced rumenitis generally has a poor surgical prognosis. Rumenotomy and/or trocar placement can be required to correct the other conditions.

In reticulum rare surgical affections occur in sheep and goat. According to eating behaviour it may result in local or diffuse peritonitis and foreign bodies may also penetrate into the thoracic cavity and the adjacent in cattle (Radostits et al. 2007).

Disease of the abomasum is much less common than in cattle and decidedly more difficult to manage surgically. Abomasal impaction, abomasitis, perforating abomasal ulcers, abomasal foreign bodies and abomasal emptying defect (AED) in Suffolk sheep can potentially be managed with surgical intervention. However, in most instances medical management should be attempted initially. There are reports that cows with abomasitis, left and right-sided displacements of the abomasum and ulcers (Mesaric et al., 2000).

The deformities of external genital organs are of special premonition because of their repercussion on the future generations. These defects are observed in different parts of the body, especially last part of the digestive tract like atresia ani. This congenital anomaly has been reported in all domestic animals. It is one of the quite frequently found defects of intestine among sheep because of recessive gene (Sutharet al., 2010).

Hernia is the protrusion of an organ or tissue through an opening (Jettennavar et al., 2010). This opening may be caused by a tear in the abdominal wall or a natural opening like the inguinal canal or femoral canal (Al-Sobayil and Ahmed, 2007).

Scrotal hernia is a rare disorder in small ruminants (Roberts, 1988). It forms as an extension of inguinal hernia, when the abdominal organs protrude through enlarged inguinal ring into the scrotum (AL-Sobayil and Ahmed, 2007). Unilateral scrotal hernia in male lambs of the Merino, Hampshire, Suffolk and in the Arabic Naimi breeds was described (AL Sobayil and Ahmed, 2007).

Cyst is a sac containing liquid or semi-solid substances and mostly has an inner lining secreting membrane. Either congenital types as tassel cysts or acquired types as thyroid cysts were reported (Valentine, 2004; Abu-Seida, 2014).

Rectovaginal fistula with atresia ani is characterized by the communication between the dorsal wall of the vagina and the ventral portion of the rectum, so that the vulva functions as common opening to the urogenital and gastrointestinal tracts (Farhoodi et al, 1987). Usually the abnormality is associated with atresia ani in which the rectum ends as a blind pouch immediately cranial to the imperforated anus (Senna et al, 2003; Bademkiran et al, 2009).

Penile urethral dilatation is a painless, fluctuating and glistening cystic like pouch covered externally with healthy skin. It varied in size from a small bean like swelling to a large mandarin like size. It extended in front of the scrotum to variable distance on the ventral aspect of the penis (El-Seddawy, 1994; Senna et al., 2003).

Ulcerations on the tongue are commonly encountered in dental practice. Solitary ulcers of the tongue are more commonly caused as a result of sharp edges of a broken tooth or ill-fitting dentures. Other less commonly known causes include traumatic ulcerative granuloma with stromal eosinophilia, atypical histiocytic granuloma, infections like tuberculosis, late stage of syphilis or fungal infections like histoplasmosis (Gopalkrishnan and Allen, 1996).

In Kuwait there are number of cases recorded by the authority regarding surgical abnormalities of sheep and goat. The present study was undertaken to record and surgical interventions were made to correct the affection in order to prevent the economic losses.

MATERIALS AND METHODS

The study was conducted from October 2017 to October 2019 in different farms belonging to Public authority for agriculture affairs and fish resources - Kuwait City, Kuwait. In this study different 96 cases (Table 1) of Digestive surgical affections in sheep and goats were recorded.

Table 1: Common surgical affection in sheep and goat in Kuwait city

No	Digestive Surgical Affections	Numbers	%
1	Umbilical hernia	26	27 %
2	Foreign body in rumen	21	21 %
3	Abdominal hernia	17	17.7 %
4	Rectal prolapse	11	11.4 %
5	Atresia ani	7	7 %
6	Abomasum displacement	3	3 %
7	Rectal carcinoma	5	5 %
8	Rumen fistula	4	4 %
9	Intestinal prolapse (omphalocele)	2	2 %
-	Total	96	-

RESULTS AND DISCUSSION

Out of 96 cases 66 (68.7%) cases were female and 30 (31%) cases were male. 69 (71%) were sheep and 27 (28%) were goat.

Various injuries were recorded and their proportions were as follows-umbilical hernia 27%, foreign body in rumen rumenotomy 21%, abdominal hernia 17%, rectal prolapse 11.4%, atresia ani 7%, abomasum displacement 3%, rectal carcinoma 5%, rumen fistula 4%, intestinal prolapse (omphalocele) 2%. On the other hand, the highest affection rate in sheep was 71%, while goats were 28%. In addition to the affection rate of females more than males, where the percentage of females was 68.7% and males were 31%. Most of the cases underwent surgery and were successful. It was noted that umbilical hernia were higher than other injuries. On the other side the least injury is the injury of the rectal prolapse as no case was observed or recorded in rectal prolapse in the sheep and also did not find any case of the abomasum displacement in the goat.

Hernias

Food was withheld for 24 h prior to surgery in each case. Surgical repair was conducted by aseptically preparing the site of operation after intramuscularly tranquilizing the fractious animals with 2% xylazine hydrochloride (Rompun 2%; Bayer, Turkey) at a dose rate of 0.05 mg/kg. The animal was restrained in the dorsal or lateral recumbent position, according to the type and position of the hernia. In cases of abdominal and

umbilical hernias, circular infiltration anaesthesia was done using 2% lidocaine (Nor brook Laboratories, UK) at a dose rate of 10 mg/kg. An elliptical skin incision was performed and the adhesions between the parietal peritoneum and skin were freed with using both blunt and sharp dissection. The hernial ring was exposed and freshened before its suturing by simple interrupted or interrupted horizontal mattress sutures with using No. 2 chromic catgut (Ethicon, UK), polydioxanone (PDS; Ethicon, UK) or silk (Lukens Medical, USA) sutures. The subcutaneous tissue was then sutured by catgut or PDS, and the excessive skin was removed before its suture with using polypropylene (Ethicon, UK) or silk suture. In cases of inguinal and scrotal hernias, linear infiltration anaesthesia was applied at the site of the operation, which was lateral to the scrotum or the udder. A linear skin incision was made followed by sharp and blunt dissection to expose the hernial contents. The contents were reduced into the abdominal cavity through the inguinal canal and the external inguinal ring was narrowed by application of interrupted chromic catgut stitches (in 1 ram to keep the testis according to the owner's request). The testicles were removed whenever they appeared atrophied, and this was followed by complete closure of the external inguinal ring using catgut, PDS or silk sutures (in 7 cases). Each animal was given postoperative therapy with penicillin-streptomycin at a dose rate of 30,000 IU/kg for the penicillin and 10mg/kg streptomycin for 5 days (Nor brook Laboratories, UK) and a prophylactic dose of anti-tetanus serum 1,500 IU subcutaneously (Al-Sobayil, 2007) (Figure 1A-D).



Figure 1: A) lateral abdomen hernia in an ewe. B) Post surgery. C) Umbilical hernia in an ewe. D) After surgery (D). E) Perineum hernia in a ewe 3 years old. F),G) Female lamb has tow umbilical hernia in one case is eight monthes old.



Figure 2: A) Rectal prolaps in a goat age is 3 years old. B) Post surgery. K) Rectal prolapse in goat age 9 months. L) After surgery

Rectal prolapse

A tube small was placed in the rectum extending proximal to the anal sphincter. The rectal tissue was secured to the retention tube with tow spinal needles at right to each other. Each needle was inserted into the skin approximately 4mm rostral to the visible prolapsed rectal mucosa, then insertion continues sequentially through the inner layer of prolapsed rectal tissue, both walls of the retention tube and the opposite inner layer of the prolapsed rectal tissue and finally exits the skin just rostral to the prolapse mucosa 180 degrees from where it entered. These needles prevent the rectal tissue from retracting into the abdomen when it is incised. In order to avoid the major blood supply, do not place a needle at the 12 o'clock position. The prolapse tissue was excised by a circular incision made as close as possible to the anus through both layers of the prolapse down to the retention tube. It is advised to make the

incision for less than one-fourth the circumference of the prolapse tissue secured to the tissue secured to the retention tube. The incised segment was closed with absorbable suture in a simple continuous pattern opposing the rectal mucosa, while including deeper muscular tissue in the suture. The resection is completed by making the incision in 4-5 separate segments followed by closure with separate continuous suture lines using no. 2-0 absorbable suture material. The dorsal most aspect of the incision was made carefully so the blood lighted prior to transection. Upon completion of the resection, the needles and tube were removed the prolapse was resolved. Rarely, the tissue is oedematous enough that reduction and purse-string suture retention is needed. (Techniques, 2015) (Figure 2).

Rectal prolapse can occur during strained delivery, as reported earlier. Care should be taken for the prolapsed rectum from any extraneous injury. The

270-degree tear in the present case could be attributed to any injury from the goat shed itself. Continued straining may be the reason for the subsequent bowel evisceration in this case. The eviscerated bowel could be easily replaced into the abdomen through the rectal tear, and repair of the tear was accomplished by simple continuous suture pattern. Diagnosis of rectal prolapse is not

difficult during the physical examination, but care should be taken that prolapse does not contain other organs and that the rectum is not damaged further during the examination (Anderson and Meisner, 2008). The usual procedure for correction of rectal prolapse is its repositioning and application of a purse-string suture (Borobia-Belsue, 2006; Jean and Anderson, 2006).

Foreign body in rumen



Figure 3: A) Ram three years old suffering from foreign body in rumen. B) Use stabler suture without traditional suture. C) Post surgery. D) Two kilograms the foreign body extract from rumen.

Rumen and abomasal impaction

The goats were fasted for 12 and 6 h for feed and water respectively. The left paralumbar fossa was clipped and the area was aseptically prepared with 0.2% chlorhexidine gluconate (Savlon®, Vervaadingdeur, Johnson and Johnson (pty) Ltd, London) (60 mL stock per liter of sterile water). Prior to anaesthesia and surgery, a drip infusion line was instituted via the jugular vein and commenced fluid therapy with 0.9% normal saline solution (Juhel®, Fabrique par Juhel Nig. Ltd/Awka, Anambra, Nigeria) as maintenance fluid, set at 180 mL per hour (1 drop per second). The experimental goats were sedated with Diazepam, (SJG®, Fazul Ellahie, Pvt Ltd, Karachi, Pakistan), given at a dose rate of 0.2 mg/kg IV. The goats in group A received 2% Lidocaine HCl 4 mg/kg (Lidocaine®, Kwality Pharmaceuticals (P) Ltd. NagKalan, Majitha Road, Amritsar, INDIA) to create an inverted L-block regional anaesthesia on the left flank (Paralumbar fossa) immediately after sedation. Animals in group B received 0.5% Bupivacaine 1.5 mg/kg (Marcaine®, Astrazeneca PLC, Ingiltere Lisansiile, Istanbul, Turkey), for inverted L-block post Diazepam, (SJG®, Fazul Ellahie, Pvt Ltd, Karachi, Pakistan), sedation. Five minutes after induction, 5 mL of blood samples were drawn from the opposite jugular vein into a plain

vacutainer tubes and kept at room temperature for 2 h before centrifugation at 4000×g for 3 min in an electronic centrifuge (Centrifuge 800B®, Union Laboratories, England). The standard laparotomy method 'through-and-through' incision was made on the upper paralumbar fossa of the left flank (Firth, 1985). The rumen was gently pulled out of the incision and firmly anchored to the skin ventrally and dorsally with two of six towel clamps for the technique. A ten centimeter (10 cm) incision was made over less vascular portion of the rumen greater curvature and its edges were fixed caudally and cranially to the skin incision with towel clamps (Dehghani, 1995). The remaining clamps were used to secure the rumen edges between the previously placed clamps with their handles away from the incision site. The rumen edges covered the skin edges by 2–3 cm. The rumen was explored and foreign materials mostly plastic bags weighing 1.26 ± 0.18 and 1.44 ± 0.86 kg for groups A and B respectively were removed, 0.9% saline solution was used to rinse the rumen ingesta. To commence rumen closure, the caudal and cranial clamps were removed first leaving the dorsal and ventral clamps in place. Double layer Cushing suture pattern was used to invert the rumen edges with a number 2 chromic catgut (LIFECARE®, Anhui Kangning Industrial group Co. Ltd, Tianchang City, Anhui, China) and polyglycolic acid sutures

(Atramat®, Internacional Farmaceutica, Planta, Mexico), for groups A and B respectively (Figure 3). The skin was closed using a size 2 nylon suture (LIFECARE®, Anhui Kangning Industrial group Co. Ltd, Tianchang City, Anhui, China) for both groups A and B in a Ford interlocking suture pattern (Weaver et al., 2005 (Figure 4).

Generally, genetics are of extreme importance regarding abomasal impaction in sheep.

Depending on an individual animal's value and owner preference, ancillary diagnostic tools may be helpful. Abomasal impaction can also occur in goats confined to semi-desert grazing of grassland/brush forage that contains a high percentage of awns, which form phytobezoars ranging in size from 2 to 10 cm. Patients with abomasal impaction showed inappetence, malaise, weakness, scant feces, and cranial right abdominal swelling/distension.



Figure 4: A) Ram 3 years old suffers from a food gathering in the abomasum. B. Removed the food gathering from an abomasum almost 9 kg. C) After clear the abomasum from and suturing.



Figure 5: A) Umbilical hernia and abomasum prolapse in lamb three months old. B) Show abomasum out site of umbilical hernia ring. C) Post surgery.

Umbilical hernia

An elliptical skin incision around the umbilical ring was extended along the linear alba for a distance of additional two centimeters. The urachus was meticulously separated, ligated and severed. The amniotic covering and the skin edges were excised. The eviscerated intestines were replaced, and the abdominal incision closed in a routine manner. The animal was given same antibiotic (twice daily) and analgesic (once daily) for 5 and 3 postoperative days respectively. Antiseptic dressing of the incision site was repeated daily for two weeks. On 10th postoperative day the cutaneous stitches were removed (Figure 5). On this day, the physiological (rectal temperature 102.0F., respiration rate

48/minute and heart rate 160/min), blood biochemical (Total Protein 7.6 g/dl) and hematological values (Hemoglobin 10.2 g/dl., Packed Cell Volume 36%, Total Leukocyte Count 8000/ μ l) were all within normal range (Benjamin, 1998)

Intestine prolapse

The condition of intestinal prolapse was corrected by flushing of the prolapsed part of intestine with sterile normal saline solution and reduction of the prolapsed part inside the abdominal cavity. The abdominal opening was closed with interrupted mattress silk sutures (Figure 6).



Figure 6: A) Intestinal prolapse in goat one year old. B) Post surgery.



Figure 7: Tumor in lower gum in ewe. And post remove tumor by ironing.

Others affection

Other affection in sheep and goat observed were tumor in lower gum in ewe (Figure 7) that was subjected to removal by surgery. The animal was recovered from the lesion.



Figure 8: Lesion on tongue in goat.

Tongue lesion caused the animal difficult to eat. The animal was treated with medication after light surgery (Figure 8).

In conclusion, surgical affections are common in sheep and goats at Kuwait may cause economic losses and most of these affections are curable.

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