Case Report

First report of benign intraluminal esophageal inflammatory fibroid polyp infected with Candida albicans in camel: A case report

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Abstract

This report described a huge (7 cm × 4 cm; 120 g weight) benign intraluminal esophageal inflammatory mass in a 3-year-old dromedary she-camel at Qassim region. Clinically, the mass was invisible but palpable at the midline of the upper third region of the neck. The case manifested severe cachexia because of the inability to swallow for 30 days in addition to permanent frothy ptyalism. Ultrasonography confirmed the existence of a hypoechoic mass obstructing the proximal esophagus that failed to be displaced by the stomach tube. The animal was prepared to lateral cervical esophagotomy where a smooth-surfaced, encapsulated, discrete, well-circumscribed polypoid, ulcerated, and fleshy mass was excised. Histopathology revealed a type of benign mesenchymal polyps that rarely affect the human esophagus defined as inflammatory fibroid polyp infected with the local Candida albicans. In conclusion, the current case is the first report of intraluminal esophageal inflammatory fibroid polyp in camels.

Key words: Polyp, fibroid, esophagotomy, ultrasonography, mesenchymal, camel.

1. Introduction

The esophagus must be included during the examination of animals with underweight, progressive weight loss, ptyalism, dysphagia, and anorexia [12]. Except for dogs living in countries where Spirocerca lupi infestation is common, the esophageal tumors and inflammatory masses are extremely rare in animals [8]. Canine, feline, and equine intraluminal protruding esophageal tumors are almost exclusively squamous cell papilloma that may be transformed into squamous cell carcinoma [4,6,7,11,21]. Only one case report of feline intraoesophageal inflammatory fibrovascular, not fibroid, polyp was found in the literature. Clinically, it was confirmed by ultrasound examination as a heterogeneous hypoechoic swelling.

The excised mass was a polypoid structure approximately 3 cm × 1 cm. Histopathologically, the polyp is greatly similar to the fibrovascular polyps that rarely affect the human esophagus and consisted of a trabeculated fibrovascular matrix of mesenchymal cells and lymphocytic infiltrates [18]. Candida albicans is an opportunistic commensal in the alimentary tract of animals. With changes in the mucosal surface as in inanition or in the mucosal flora as in prolonged antibiotic therapy, this yeast becomes pathogenic for the mucosal keratinized squamous epithelium of mouth and esophagus, especially in young animals. The resultant mucosal damage may be induced by yeast-produced enzymes, including proteinases and catalases, or by neutrophil-produced enzymes such as myeloperoxidase. Lesions include multiple foci of mucosal necrosis, submucosal neutrophilic infiltrations as well as intralesional polymorphic...
forms of the yeast as pseudohyphae, true hyphae, and pale staining thin-walled blastopores [14].

2. Case presentation

2.1. Case history and clinical examination

A 3-year-old dromedary she-camel was submitted to the Veterinary Teaching Hospital of Qassim University during September 2019. The case history was an inability to swallow for 30 days. Thus, the animal appeared thin and very weak with profuse frothy salivation (Figure 1a). Except for cervical cauterization, the client said, no medication was attempted. Palpation of the neck exhibited a hard mass at the midline of the upper third region. Choke was suspected, so stomach-tubing trials were attempted but failed to push the mass downward towards the rumen.

2.2. Ultrasonography

The animal was prepared to ultrasonographic examination after intravenous (IV) light sedation (0.2 mg/kg xylazine HCl; Seton 2%, Laboratorios Calier, S.A., Barcelona, Spain). A 3.5-5 MHz sector and 7.5 MHz linear transducers (SSD-500, Akola, Japan) were used. Sonography showed a hypoechoic intraluminal swelling of the proximal esophagus (Figure 1b). Therefore, exploratory surgical interference was the approach of choice.

2.3. Surgical interference

The camel was admitted to an in-door clinic and prepared to lateral cervical esophagotomy. It was restrained with ropes in right lateral recumbency and deeply sedated by IV injection of xylazine HCl (Seton 2%, Laboratorios Calier, S.A., Barcelona, Spain) at a dose rate of 0.3 mg/kg. A stomach tube was placed on the level of obstruction. The neck region at the site of obstruction was prepared for aseptic surgery. Local analgesia using 2% lidocaine (Norbrook Laboratories, UK) at a dose rate of 10 mg/kg 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 the esophageal wall before making an incision to open its lumen. The mass was attached to the esophageal wall and obliterating the lumen (Figure 1c). A blunt dissection for the mass was applied to relieve it from the esophageal wall, but it failed. Thus, esophageal resection and reconstruction were applied to the site of the mass. The esophageal wall was then sutured in two layers of lambert technique using polyglycolic acid 910 (Vicryl) no. 0 (United medical industries Co. Ltd., Riyadh). The surgical site was flushed with sterile normal saline and cervical muscles were sutured in a simple continuous pattern by Vicryl no. 0. The skin was then sutured by simple interrupted stitches using No. 1 silk suture (United medical industries Co. Ltd.).

Postoperative therapy with penicillin-streptomycin (Pen & Strep, Norbrook Laboratories, UK) at a dose level of 30,000 IU/kg for the penicillin, 10mg/kg streptomycin and 1.1 mg/kg flunixin meglumine (Finadyin, Schering-Plough) were given once IV then intramuscularly for 5 consecutive days. Dextrose 5% in normal saline (2-3 L, Saudi Pharmaceutical solution industry, Riyadh, KSA) was given IV once 24 h postoperatively. A day later, the patient was allowed to suckle camel milk. Roughages were introduced gradually from day 7 postoperatively.

2.4. Pathological findings

Grossly, the mass appeared as nearly as a rounded polyp, approximately 7 cm length, 4 cm width, and 120 g weight (Figure 1d). Furthermore, it was encapsulated and focally ulcerated with a dry tan fleshy cut-surface. Small fresh specimens were harvested from the mass, for histopathology, and immediately fixed in 10% neutral buffered formalin for 24 hours. Thereafter, the specimens were prepared through the conventional paraffin embedding technique (dehydration in ethyl alcohol, clearing in xylene, and embedding in melted paraffin wax at 60 °C). Five
microns thick sections were cut and stained with hematoxylin and eosin (H&E), others were stained with periodic acid-Schiff reagent (PAS) for the detection of yeasts and Van Gieson stain for demonstration of collagen fibers [19]. Microscopic examination revealed that the mass was composed of a few mesenchymal cells with pale ovoid nuclei (Figure 2a) scattered within a dense edematous collagenous vascularized stroma (Figure 2b) that appeared red by Van Gieson stain (Figure 2c). The latter exhibited extensive widespread mixed inflammatory cells infiltrate of neutrophils (Figure 2d), eosinophils (Figure 3a), macrophages (Figure 3b), and lymphocytes (Figure 3c). In addition, microscopic multiple foci of necrosis composed of eosinophilic and basophilic cellular debris (Figure 3d), besides intralesional septate hyphae and pale stained, thin-walled oval and rounded yeasts typical of Candida albicans were evident (Figure 4a). Upon PAS staining, both yeasts and hyphae appeared red (Figures. 4b, c).

2.5. Outcome

The operated camel was confined in a stall rest and monitored daily for healing progress. It was discharged from the in-door clinic approximately 4 weeks postoperatively after regaining its normal appetite and health condition. Furthermore, neither postoperative complications nor evidence of recurrency was noticed along a 6-month-period of follow up.

3. Discussion

As veterinary tumorous lesions continue to move closer to human ones, it is likely that many of the diagnostic features used to identify human masses already used in veterinary practice. Additionally, differentiation between the inflammatory polypoid and tumor masses of the gastrointestinal tract represents a common diagnostic challenge for the pathologists [13]. Human inflammatory polyps are very rare benign polypoid lesions usually found anywhere in the gastrointestinal tract, rarely in the esophagus. They most often appear as pedunculated intraluminal polypoid encapsulated masses with frequent ulceration. They show a wide range in size, from 1 to more than 10 cm. The cut surface is tan or white, often with a glistening or fleshy appearance. Microscopically, two types of gastrointestinal polyps are known, the mesenchymal polyps that composed of spindled cells, and the epithelial polyps containing rounded cells. Both are hypocellular lesions with vascularized loose stroma containing a conspicuous inflammatory cells infiltrate, primarily of eosinophils, but also macrophages, neutrophils, and lymphocytes may be included [17]. The present mass was relatively huge measuring 7 cm × 4 cm, thus caused complete dysphagia. As a sequel of inanition, it was infected by the local Candida albicans. The noticeable ulceration may be
attributed to the desquamation of the necrotic mucosal cells. The inflammatory cells infiltrate was almost exclusively neutrophils rather than eosinophils. A possible explanation of this is secondary infection by *Candida albicans*.

The human intraluminal esophageal mesenchymal polypoid masses include inflammatory fibroid polyp [5], fibrovascular polyp [22], lipomatous polyp [9], squamous cell papilloma [3], hemangioma [10], and granular cell tumor [20]. Infectious etiologic agents of inflammatory fibroid polyps have been reported [2,15]; however, no agent has been identified in some studies [16]. Nowadays, most observers consider such polyps a form of reactive pseudotumor [17].

Early surgical excision of intraluminal esophageal inflammatory fibroid polyp is the treatment of choice concerning animal survival. Untreated polyps can become quite large and life-threatening [1]. The decision to enucleate the polyp or to euthanize the animal is based on several factors as nature, size, and invasion degree of the polyp as well as the health status of the animal. The present polyp was referred as a life-threatening lesion, which would have indicated a good prognosis if surgical excision had been attempted.

**Conclusion**

Ultrasonography was helpful in the detection of choking polyps, but histopathology still the cornerstone of the definitive and differential diagnosis of such lesions. The current mass was diagnosed as a benign intraluminal esophageal inflammatory fibroid polyp that should be included in the differential diagnosis of esophageal obstructive masses in animals. Furthermore, the surgical intervention is the only treatment to save the animal life. To literature, such polyp does not previously reported in the esophagus of any animal species. Therefore, it is the first report in camels that supports the concept of continuous movement of the veterinary tumorous lesions closer to human ones.

**Author contribution**

Elsayed Elmanakhly: Supervision; histopathology; writing; reviewing& editing.  
Mohamed Tharwat: Clinical examination; ultrasonography; stomach tubing; gross photographing; writing & editing.  
El-Sayed El-Shafaey and Madeh Sadan: Surgical excision of the polyp; writing & editing.  
Abdullah Aljohani: Methodology, special staining, writing & editing.

**Funding**

This research received no external funding.

**Compliance with ethical standards**

This study was approved by the Animal Care and Welfare Committee, Deanship of Scientific Research, Qassim University, Kingdom of Saudi Arabia.

**Conflict of interest**

The authors declare that there no conflicts of interest.

**References**