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CASE REPORT

Oleander poisoning in cattle

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Özet

Özdemir O, Çiftçi MK, Maden M. Sığırlarda zakkum zehirlenmesi. ***Eurasian J Vet Sci, 2011, 27, 1, 73-76.***

Bu vaka sunumunda bir sığır çiftliğinde Nerium oleander (zakkum) bitkisinin yaprakları ile oluştuğu düşünülen zehirlenmedeki patolojik bulgular tanımlanmıştır. Klinik olarak ani ölüm, anemi ve ishal gözlenen hayvanların nekropsilerinde akciğerler, kalp ve beyinde değişen derecelerde hiperemi, ödem ve peteşiyel kanamalar gözlendi. Histopatolojik incelemelerde kalp ve beyinde ödem, hiperemi ile yer yer kanama, miyosit ve nöronlarda da dejenerasyon ve nekroz belirlendi. Sonuç olarak; tespit edilen patolojik bulgular, yemliklerdeki zakkum yapraklarının görülmesi ve zakkum ağaçlarının kesilmesini takiben ölümlerin durması ile zehirlenmelerin zakkum bitkisine bağlı olarak oluştuğu kanısına varıldı.

Abstract

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In this case report, pathological findings in cattle poisoning that was thought to be caused by the leaves of Nerium oleander in a farm was described. Clinically, sudden death, anemia and diarrhea were seen. Post-mortem examination of the animals revealed changing degrees of hyperemia, edema, and petechial bleedings were observed. In histopathological examination, edema, hyperemia and occasional hemorrhage with degeneration and necrosis in myocytes and neurons in heart and brain were detected. Based on the pathological findings, observations of oleander leaves in the feeders and deaths after the oleander trees were cut down have verified the diagnosis of oleander poisoning in these cattle.

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► Conclusions

Oleander (Nerium oleander), which grows in tropical and subtropical regions, is a 3 to 3.5 meter tall plant with yellow, white, red and pink flowers. It naturally grows especially on the coastal areas of the Mediterranean and Aegean regions in Turkey and is used as an ornamental plant (Anonymous 2006). Its poisonous effect is known since the ancient times, being referred to the death of many soldiers and horses during military expedition of Alexander the Great to Persia (Uysal 2006).

The oleander plant includes glycosides with cardiotoxic effects such as oleandrine, neriin, digitoxigenin and olinerin, the first two being the most famous and toxic ones. Although these glycosides do not contain digitalis, they increase the amount of Na in cells and K in plasma by deactivating Na-K-ATPase as acting in the same way of digitalis. When taken in high doses for a long time, they result in sudden death by degenerating the active cell membrane transport and causing arrhythmia (Laborde and Leon 1992, Kaya and Pirinçci 1995). Oleander poisoning in animals usually takes place when the plant leaves were mixed up with haystack, silage or grass in pastures. The lethal dose can vary according to animal species; 50 mg/kg for cattle (Oryan et al 1996), 110 mg/kg for goats (Aslani et al 2007, Barbosa et al 2008), 250 mg/kg for sheep (Adam et al 2001) and 4000 mg/kg for rats (Haeba et al 2002). Following the consumption of the plant by human, clinical symptoms such as severe diarrhea with stomach ache, perspiration, quivering, exhaustion, arrhythmia and sudden death can be seen. It is indicated that only one leaf can kill a child (Shaw and Pearn 1979). Deaths due to use of oleander branches as sticks for kebab cooking were also reported (Uysal 2006). Diagnosis of the oleander poisoning can be confirmed by observation of the plant leaves in the stomach or oleandrine in the contents of the stomach, intestines and/or milk (Anonymous 2006, Kirk et al 2006).

Oleander poisoning in cattle has been occasionally seen. According to the report of Kirk et al (2006) death of 5 cattle out of 400 in a milk farm where oleander trees were present took place. In another occasion, 24 out of 200 animals were noted to die within 1-3 days after eating the plant, and death of 5 animals and severe diarrhea and exhaustion in 2 out of 120 cattle in a farm where pieces of dry oleander trees were scattered was quoted by the same authors. In Brazil, death of 57 cattle out of 92 poisoned animals with clinical signs of diarrhea and depression were reported. In that report, no other findings were observed except

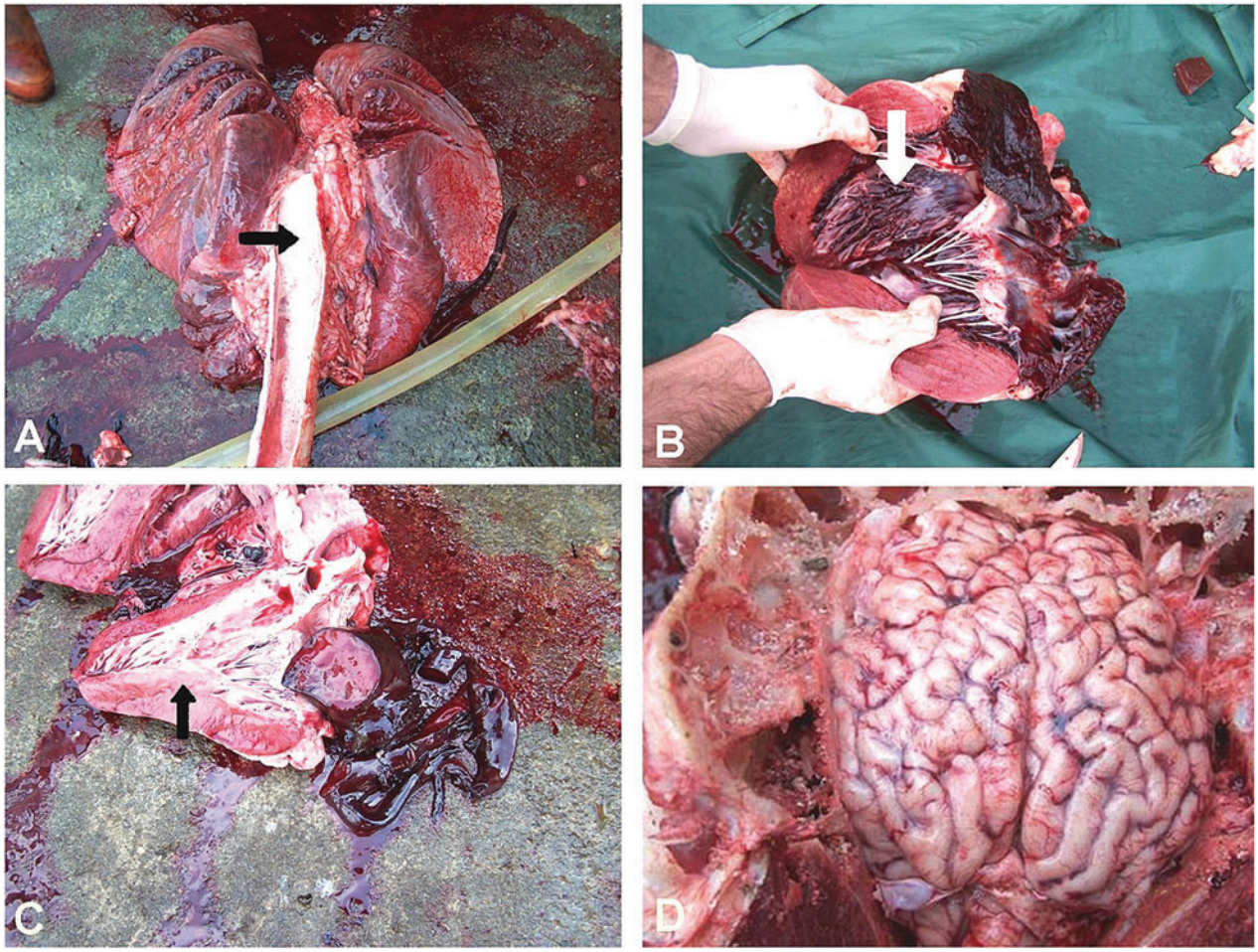

Figure 1. A: Congestion in lung and foamy exudate in trachea (arrow). B: Extensive hemorrhage in endocardiom (arrow), C: Paleness in myocardium (arrow) and post-mortal blood clot. D: Hyperemia and edema in meninges.

the presence of widespread bleeding (Soto-Blanco et al 2006). In another case report, death of 7 out of 17 cattle was recorded. In these animals, arrhythmia and atrioventricular bloc were detected clinically, and in the post-mortem examination subendocardial and abomasal bleeding was seen (Mahin et al 1984).

In this case report, cattle poisoning that were thought to be caused by the consumption of oleander plant leaves in a farm located in the Aegean Region was described and the pathological findings were defined. In the present case, death of 18 cows was reported between 14 and 26 of May 2006. Some cows with anemia and diarrhea from the same farm were also compulsorily sent to slaughter. Occurrence of cattle deaths in May and June in previous years were indicated. Necropsy was carried out on two of the death animals.

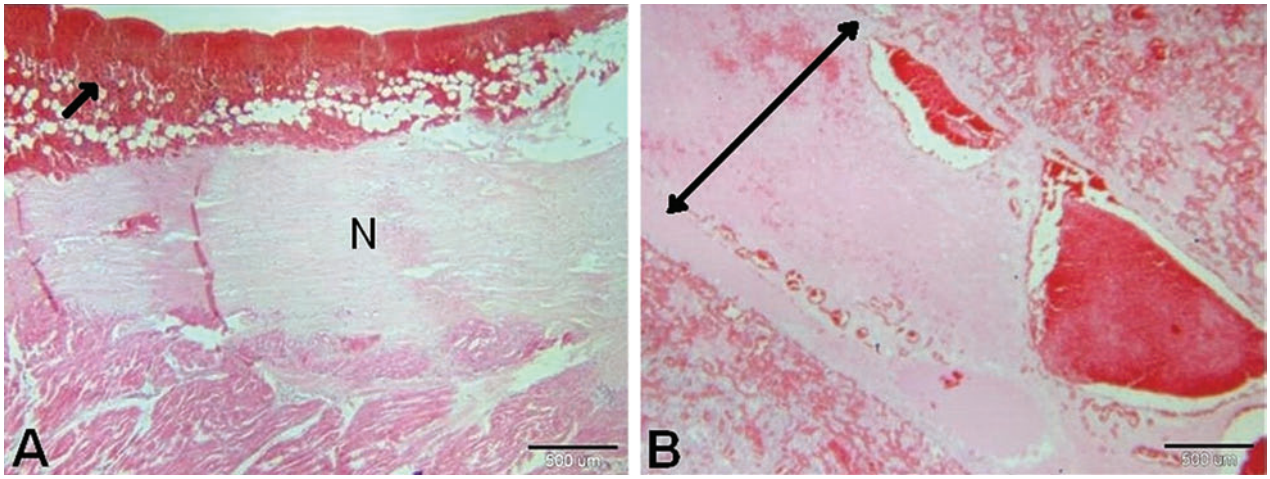

Figure 2. A: Extensive hemorrhage (arrow) and necrosis (N) in myocardium, H&E. B: Alveolar and interstitial edema (two sided arrow) in lung, H&E.

In postmortem examination, similar findings were observed in both animals. Prominent macroscopic changes were noted in lungs and heart. Severe congestion, considerable thickening in the interlobular interstitium and dense foamy exudation in the trachea and bronchi were observed in lungs (Figure 1A). Widespread petechial bleedings were present in epicardium and endocardium (Figure 1B). Myocardium, especially in the left ventricles and papillary muscles, was considerably pale (Figure 1C). The left ventricles were also fully filled with post-mortal blood clot. Liver was congestive, fragile, and blunt edged. Kidneys were swollen. The mucosal surface of abomasums was hyperemic. In intestines, hyperemia on the mucosa and mucoid exudation in lumens were observed. Mesenteric lymph nodes were comparably bigger. Meninges were hyperemic and edematous, and the brains were swollen. (Figure 1D).

Histopathological examination revealed severe edema, hyperemia, and bleeding in hearts with widespread degeneration and necrosis in myocytes (Figure 2A). Degeneration, necrosis and edema were observed in the arterial walls of muscular arteries especially in hearts and lungs. Interlobular septa in lungs were also edematous (Figure 2B). Multifocal necrotic areas were present in livers. Edema, hyperemia, hemorrhage and neuronal degeneration were detected in brains. Necrosis, hyperemia and mononuclear cell infiltration were also seen with occasional intensive eosinophil granulocytes infiltration in the lamina propria of intestines.

Animal deaths in the present case were encountered in only one cowshed though there were many in the farm. It was observed that oleander trees were quite close to the mangers and oleander flowers and leaves that had fallen down were mixed up in the animal feed (Figure 3).

Clinical and postmortem observations of the cows in the current case were consistent of that of previous oleander poisoning cases (Mahin et al 1984, Kirk et al 2006, Soto-Blanco et al 2006). Congestion, edema and foamy exudation encountered in the animals were thought to be caused as a result of respiratory and heart failure. It was reported that oleander plant

Figure 3. Oleander trees right next to the feeders and dried oleander leaves (inlet picture) in the feed (arrow).

contains glycosides, such as neriine, digitoxigenin and olinerin, and cause degeneration and necrosis in the myocytes (Kaya and Pirinçci 1995, Kirk et al 2006, Barbosa et al 2008). Widespread bleeding and necrosis seen in histopathological examination were thought to be the cause of death in these animals. The observations in the brain were in company with the findings of Aslani et al (2004). As Oryan et al (1996) reported, multi-focal necroses were observed in the liver. Findings for the other organs were also similar to those in previous experimental and case studies (Adam et al 2001, Aslani et al 2004, Kirk et al 2006, Aslani et al 2007, Barbosa et al 2008).

Though toxin isolation was not carried out in the present case, observation of oleander leaves mixed up in the animal feed in the mangers together with the lesions observed in the heart muscles and veins made the researchers think that this case was an oleander poisoning. Moreover, cutting down all the oleander trees in the area stopped later deaths has verified this assumption. In later years, no such animal deaths were also reported from the farm.

This case was found worth to present since the existence of large growing geography of oleander tree in Turkey where no toxicity in cattle were reported previously. The findings of this case presentation will help field veterinarians in diagnosing the disease.

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