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Omental lipoma in a slaughtered lamb

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Abstract

Background: Lipoma is a benign tumor of well-differentiated adipocytes and has been reported in some domestic animals. Omental lipomas in human and domestic animals are rare and reported as a case report.

Objective: the aim of this study was to report an omental lipoma in a slaughtered sheep.

Method: In the observational examination of a sheep in a slaughterhouse in Tehran province, Iran and during the inspection of the abdominal area, a mass was seen on the greater omentum. The mass was sampled and placed in 10% formalin to be used for histopathology.

Result: The mass was single, soft and dense, capsuled, oval, weighing 150 grams and measuring 4.5 x 3.5 cm in diameter. Microscopic examination showed omental mass composed of uniform and mature lipocytes encased within a thick layer of immature connective tissue. The final diagnosis was primary benign lipoma.

Conclusion: lipoma can occur anywhere in the body where there is fat cell, and probably obesity and trauma are important risk factors for its occurrence, and the size of the lipoma mass may be useful in predicting the age of the mass.

Key words: Adipocyte, lipoma, omentum, slaughtered lamb.

Introduction

Lipocytic mass is classified as pure lipocytic tumours (lipomas, liposarcomas and infiltrative lipomas) and mixed cell types such as fibrolipomas(Agerholm *et al*., 2016).

Lipoma is a well bounded adipocytic lesion that is histologically determined with lobules of mature fat cells (Di Giancamillo *et al*., 2002; Sickinger *et al*., 2009; O'Neill *et al*., 2018). This mass is a benign tumor of well-differentiated adipocytes and has been reported in domestic animals including dogs(Bergman *et al*., 1994; McChesney *et al*., 1980) (O'Neill *et al*., 2018), horses (de Barros, 2020) (Hammer *et al*., 2002), donkeys (Mozaffari and Derakhshanfar, 2011; Mohyeddin *et al*., 2022), and cattle(Agerholm *et al*., 2016; Sickinger *et al*., 2009; Ghuman *et al*.) (Mahajan and Gupta, 2017). Occurrence of lipoma in sheep is rare. However, there are some case reports on the occurrence of this tumor in the meninges(Curson, 1933), abomasum (Azizi *et al*., 2011) and skin (Ahmed and Hassanein, 2012) of sheep.

Despite the fact that lipomas are common in humans and can occur anywhere in the body, lipomas of the omental in human are rare and reported as a case report(Luo *et al*., 2005; Chaudhary *et al*., 2011) (Li *et al*., 2022). Also, omental lipomas are rare in domestic animals and have been reported as case reports in some studies in dogs (Bertolini, 2017; Jang *et al*., 2021). Although there are little information about risk factors for occurrence of lipoma in animals, age,

overweight, breed and gender are suggested as risk factors for occurrence of this tumor in dogs(O'Neill *et al*., 2018).

Despite the rarity of lipoma in sheep, its occurrence in an unusual location in this animal is surprising and the purpose of the present study is to describe the macroscopic and microscopic characteristics of lipoma in the omentum of sheep and to report lipoma of omentum as a rare tumor occurring in an unusual location in sheep.

Clinical presentation

In an observational examination of a 6-month-old male lamb in Shahre Ray slaughterhouse in Tehran province, Iran in February 2023 and during the inspection of the abdominal area of this lamb, a single, unusual and palpable mass was seen on the left side of the rumen and inner surface of the parietal layer of the greater omentum. The carcass of this lamb is otherwise normal. This lamb belonged to a herd of 100 fattening native lambs that were sent together to be slaughtered, and none of the carcasses of other lambs in this herd had such masses. Before slaughter, this lamb did not has any clinical signs and appeared healthy.

Diagnostic testing

First, the macroscopic characteristics of the mass including shape, weight, consistency, size, color, and etc., were recorded. This mass was then cut to examine its cross section for macroscopic characteristics. In the following, a part of the mass was sampled and placed in 10% formalin to be used for histopathology. Hematoxylin and eosin staining was performed on the sample taken for histopathology.

Macroscopic characteristics

The mass found on the omentum of the lamb carcass was single, soft and dense, capsuled, oval, weighing 150 grams and measuring 4.5 x 3.5 cm in diameter. Apart from this mass, no other obvious lesions were seen in omentum. After cutting, the mass had three distinct parts from the outside to the inside: 1. Milky white omentum 2. Thick and creamy capsule 3. The dense tissue inside the capsule which is gray and in some parts yellowish cream. (Figure 1).

Figure 1: A capsuled and oval mass, weighing 150 grams and measuring 4.5 x 3.5 cm in diameter. Thick and creamy capsule around the mass and dense tissue inside the capsule is seen.

Microscopic characteristics

Microscopic examination showed omental mass composed of uniform and mature lipocytes (homogenous mature adipose tissue) encased within a thick layer of immature connective tissue (reactive fibroblasts covering the surface of the omental lipoma). The mass consisted of lobules of variable size separated by fibrous septa. Each lobule was composed of uniform and mature of lipocytes. (Figure 2).

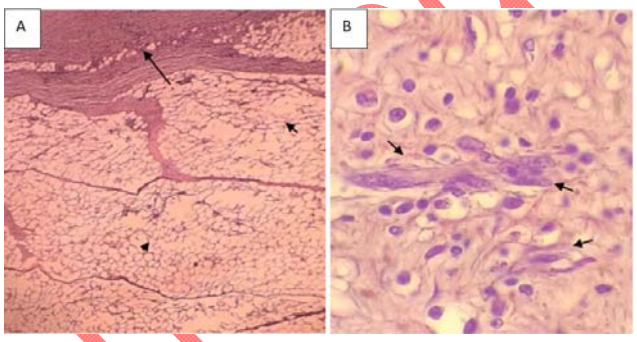

Figure 2: A: Uniform and mature lipocytes (small arrow) encased within a thick layer of immature connective tissue (large arrow); H&E staining; mag: 100X. B: Reactive fibroblasts covering the surface of the omental lipoma. H&E staining, Mag: 1000X.

The definite diagnosis was primary benign lipoma

Assessments

The occurrence of tumors in small ruminants is not uncommon (Sasani *et al*., 2017; Omidi *et al*., 2018). Lipomas are mesenchymal tumors. They are soft masses without pain, and can be detected anyplace in the body where normal adipocytes are existed (Kolb *et al*., 2022). However, omental lipoma is rare in humans and domestic animals and is usually appeared in literature as a case report (Li *et al*., 2022; Song *et al*., 2019). To our last knowledge, omental lipoma in domestic animals has been reported only in dogs (Bertolini, 2017; Song *et al*., 2019). A potential relation between trauma and the formation of lipoma has been suggested (Charifa *et al*., 2022) (Aust *et al*., 2007) and the rarity of trauma to the omentum may explain the rarity of omental lipoma, although this needs further study. Although the exact cause of lipoma is unknown, trauma, genetics, diabetes, and obesity have been implicated in the etiology of lipoma in humans and animals(Kolb *et al*., 2022; O'Neill *et al*., 2018, AL-Obeidi and Mansoor, 2023; Keywanloo *et al*., 2021). In addition, age (middle to old), overweight, breed and gender (female) are suggested as risk factors for the occurrence of lipoma in dogs(O'Neill *et al*., 2018). The cause of omental lipoma was not determined in this study, but obesity as a risk factor for lipoma was present in this sheep. However, the risk factors of lipoma occurrence in animals need more studies.

Lipomas usually occur without symptoms and they are found incidentally when an examination is done for another reason (Okromelidze *et al*., 2019) (Emekli and Gündoğdu, 2022). In a study, non-cutaneous malignant melanoma without previous clinical signs was observed in a slaughtered goat (Hatefi *et al*., 2021). The sheep with lipoma in the present study was asymptomatic and the lipoma was found incidentally in the observational examination of the carcass in the slaughterhouse.

Lipomas often have a fibrous capsule and they are commonly singular (Charifa *et al*., 2022). These features were observed in this study. Lipoma is a well bounded adipocytic lesion that is histologically determined with lobules of mature fat cells (Di Giancamillo *et al*., 2002; Sickinger *et al*., 2009; O'Neill *et al*., 2018), which was also present in this study. Previously reported cutaneous lipomas in sheep had mature adipocytes similar to this study (Ahmed and Hassanein, 2012). Morphologically, it has been reported that canine lipomas are typically homogeneous with sharp edges, and a thin capsule (Song *et al*., 2019), while thick capsule around the mass and dense tissue inside the capsule were seen in the present study. In some studies, lipoma has a necrotic center(Song *et al*., 2019), which was not present in this study. Size of lipoma mass in our study is smaller than other omental masses reported in human(Luo *et al*., 2005; Li *et al*., 2022; Chaudhary *et al*., 2011) and dog(Song *et al*., 2019). Omental lipoma in humans and dogs was usually diagnosed when the lipoma mass became large enough to develop clinical findings such as abdominal distension(Luo *et al*., 2005; Li *et al*., 2022; Chaudhary *et al*., 2011) (Song *et*

al., 2019) but sheep in our study was slaughtered and its omental mass probably had not time to be large enough. So, it is possible to comment on the age of the lipoma mass based on the size of the tumor, but this issue needs to be more studied.

Lipoma in sheep is rare and has been reported in the abomasum (Azizi *et al*., 2011), meninges (Curson, 1933) and skin (Ahmed and Hassanein, 2012). To our knowledge, omental lipoma is reported for the first time in sheep in this study and the occurrence of this rare tumor in a rare place is surprising and determining the cause of its occurrence requires further study and investigation.

In conclusion, lipoma can occur anyplace in the body where there is fat cell, and probably obesity and trauma are important risk factors for its occurrence, and the size of the lipoma mass may be useful in predicting the age of the mass.

Conflict of interest declaration

Authors declare no conflict of interest.

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لیپومای چادرینه در یک رأس بره کشتار شده

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چکیده

زمینهٔ مطالعه: لیپوما تومور خوش خیم سلول‌های به خوبی تمایز یافتهٔ بافت چربی است و در برخی دام‌های اهلی گزارش شده است. وقوع لیپومای چادرینه در انسان و دام‌های اهلی نادر است و گزارش آن به صورت گزارش مورد است.

هدف: هدف از این مطالعه گزارش لیپومای چادرینه در یک راس گوسفند کشتار شده است.

روش کار: در بررسی مشاهده‌ای یک گوسفند کشتار شده در یک کشتارگاه در استان تهران، ایران و در طول بررسی ناحیهٔ شکم این گوسفند، توده‌ای روی چادرینهٔ بزرگ‌تر دیده شد. این توده مورد نمونه برداری قرار گرفت و نمونهٔ حاصله در فرمالین 10٪ قرار داده شده تا برای بررسی آسیب شناسی استفاده شود.

نتایج: تودهٔ مدنظر تکی، نرم و متراکم، کپسول‌دار، بیضی شکل، با وزن 150 گرم و قطر 4/5 × 3/5 سانتی متر بود. بررسی میکروسکوپیکی وجود یک تودهٔ چادرینه‌ای متشکل از سلول‌های چربی یکنواخت و بالغ قرار گرفته در یک لایهٔ ضخیمی از بافت همبند نابالغ را نشان داد. تشخیص نهایی این تودهٔ چادرینه‌ای لیپومای خوش خیم اولیه بود.

نتیجه گیری نهایی: لیپوما می‌تواند در هر جایی در بدن که سلول چربی دارد، رخ دهد و احتمالاً چاقی و ضربه عوامل خطر مهمی برای وقوع لیپوما هستند و همچنین این احتمال وجود دارد که اندازهٔ تودهٔ لیپوما در پیش بینی سن توده مفید باشد.

کلمات کلیدی: چادرینه، سلول چربی، بره کشتار شده، لیپوما