

# Chondroid lipoma: A rare recently described benign lipomatous tumor

Salman T. Al-Malki, Abdullah S. Al-Khamiss

## ABSTRACT

**Introduction:** lipomatous tumors group is a group of tumors containing both benign and malignant neoplasm, that sometimes have some morphological overlapping. Chondroid lipoma is one of the rare benign lipomatous tumors that have been described recently. Although it is benign in nature, its microscopic picture is mimicking some of the malignant tumors, especially myxoid liposarcoma. **Case Report:** A 51-year-old female presented with a mass arising on her right thigh. This mass grew slowly during the several months ago. Radiologically, it was described as a well-circumscribed benign mass with scanty fatty component. Surgical excision and primary closure was performed for the patient. **Histopathological examination** demonstrated a well-circumscribed mass formed by cords and nests of lipoblasts and lipocytes embedded in a prominent myxoid to hyalinized chondroid matrix. A panel of immunohistochemical (IHC) stains had been done. From the clinical, radiological, and pathological information, the diagnosis of chondroid lipoma was made. **Conclusion:** This case is considered a rare variant of lipoma and easily can be misdiagnosed as myxoid liposarcoma or extra-skeletal myxoid chondrosarcoma. So, the pathologist should be

aware of this entity when he/she comes across such cases.

**Keywords:** Lipoma, Chondroid lipoma, Myxoid liposarcoma, Extra-skeletal chondrosarcoma

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## INTRODUCTION

Lipomatous tumors have a broad clinical and morphological spectrum ranging from benign cases to malignant ones. Myxoid liposarcoma is the second most common type of liposarcoma. It represents 30% of liposarcomatous tumors in general. Mostly, it arising in the thigh of 30–40 years age group patients in both sex equally. It has the tendency to recur and metastasis distally. In the last few years, a rare variant of benign lipomatous tumors have been described, called “chondroid lipoma”. Although this variant is benign in nature, its histopathological morphology make it one of the great mimicker of many malignant soft tissue tumors, especially myxoid liposarcoma.

## CASE REPORT

A 51-years-old female was presented to the outpatient department with a right thigh swelling. This swelling

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started to appear several months ago. It was painless but slowly progressive. There was no decrease in weight or loss of appetite.

On physical examination, there was a non-tender mass in the upper part of the right thigh. This mass was firm, deeply-seated, roughly oval, and not pulsated or fixed to the skin. Laboratory examinations such as CBC, LFT, RFT, and minerals ( $\text{Na}^+$ ,  $\text{K}^+$ , and  $\text{Ca}^{+2}$ ) were all within normal limits. The radiological examination showed well-defined mass contain only a small amount of fatty tissue distributed centrally and peripherally (Figure 1). The mass had been excised and the gross picture showed a circumscribed lobulated tan-yellowish mass measuring 5.2x4.3x3.8 cm (Figure 2).

Microscopically, the mass was well-circumscribed and formed by lobules separated by fibrous septa. Each lobule was formed by nests and cords of cells embedded in a chondroid-myxoid background (Figure 3). The cells had variable morphology: some of them are mature adipocytes with single large intracytoplasmic vacuole, others had multivacuolated cytoplasm resembling lipoblasts (Figures 4 and 5).

Some of the cells had a pericytoplasmic clear zone (lacunae-like), making it resembling chondrocytes (Figure 5). Mild nuclear pleomorphism and rare scattered mitoses are noted (Figure 6). No chicken-wire blood vessels seen in the background. IHC stains showed that the tumor cells were positive for Vimentin (Figure 7) and S100 (Figure 8) and negative for CK, EMA, CD34, SMA, desmin, and HMB45.

Based on the previous findings, a diagnosis of chondroid lipoma was made. The patient had been discharged with a follow-up appointment.

## DISCUSSION

Lipomatous tumors are one of the most common soft tissue tumors that usually diagnosed by the pathologists.

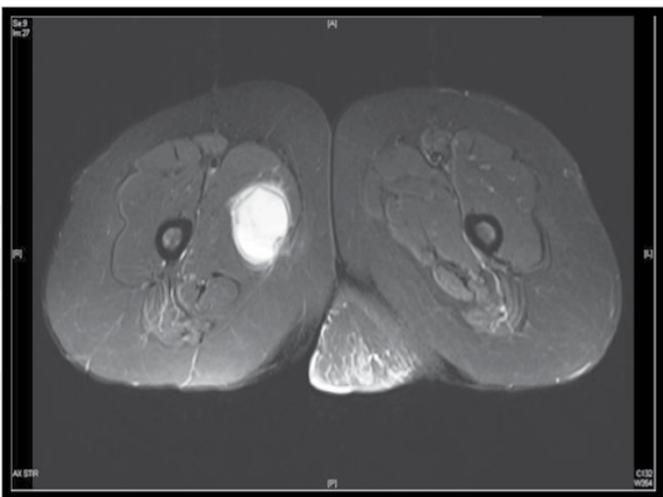


Figure 1: Radiological picture showing thigh with deep-seated well-circumscribed mass.



Figure 2: Gross picture showing a circumscribed tan-yellow lobulated mass.

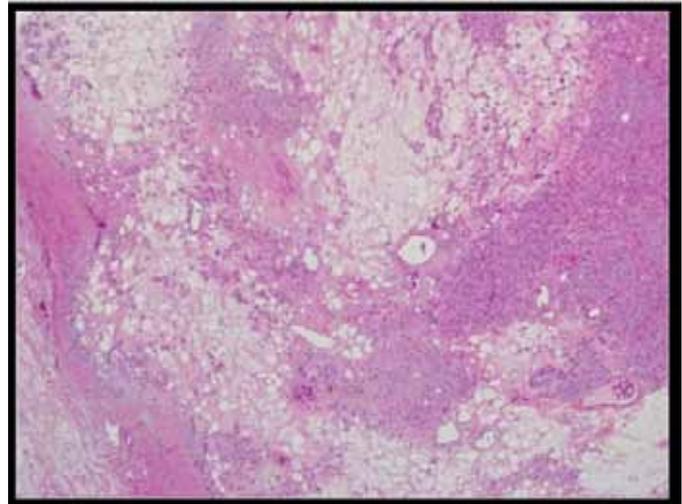


Figure 3: Low-power view demonstrating that the lesion has lobular pattern with a myxoid background (H&E stain, x40).

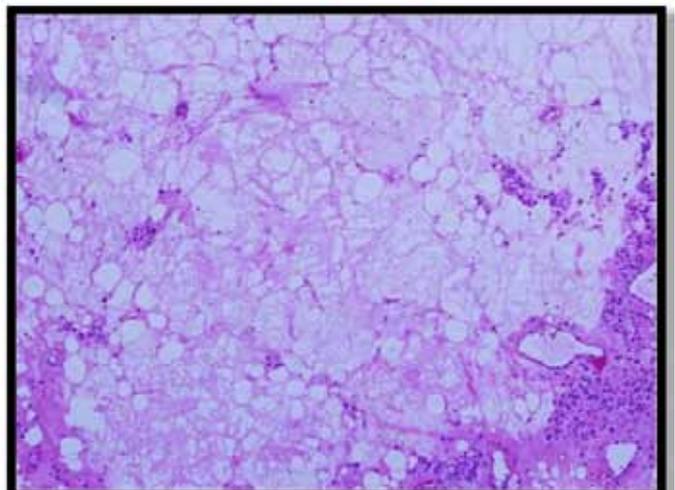


Figure 4: Intermediate-power view showing mature fat cells with degenerative changes and the surrounding chondromyxoid matrix (H&E stain, x200).

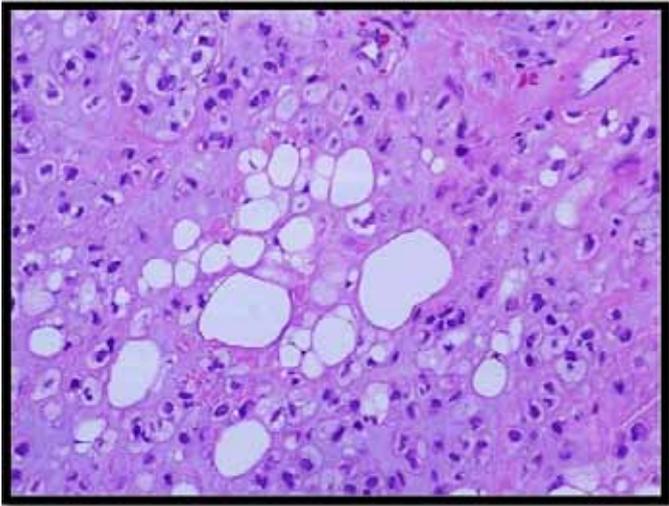


Figure 5: High-power view showing mature fat cells and lipoblasts embedded in a chondroid matrix. Some lacunae-like cells are also present (H&E stain, x400).

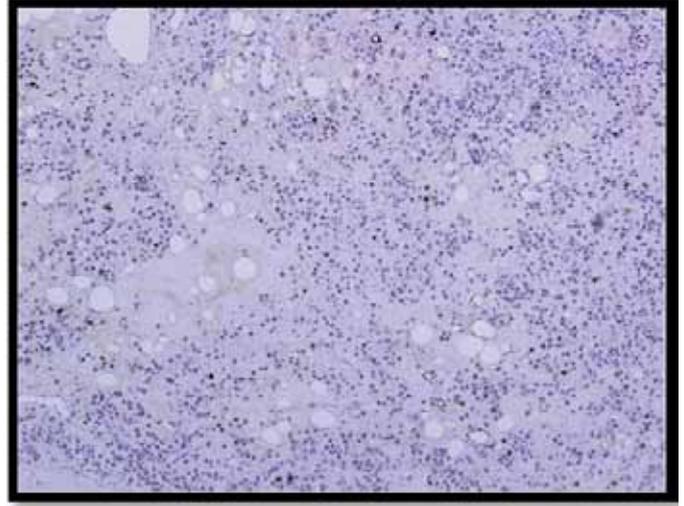


Figure 8: The cells are focally positive for S100 (immunohistochemistry stain, x200).

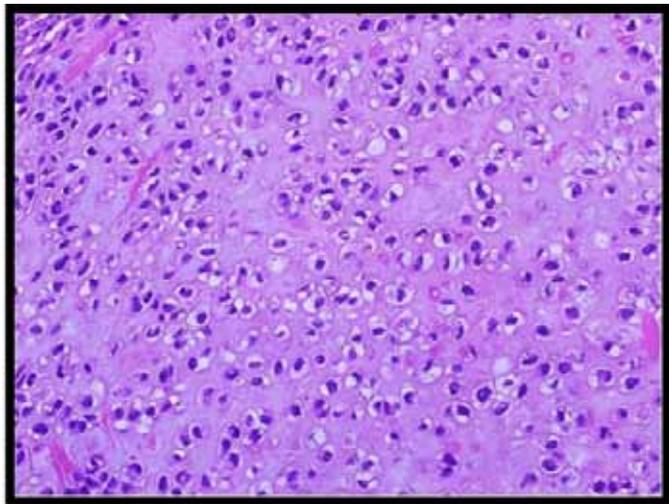


Figure 6: High-power view showing many lipoblasts with mild nuclear pleomorphism embedded in a chondroid matrix (H&E stain, x400).

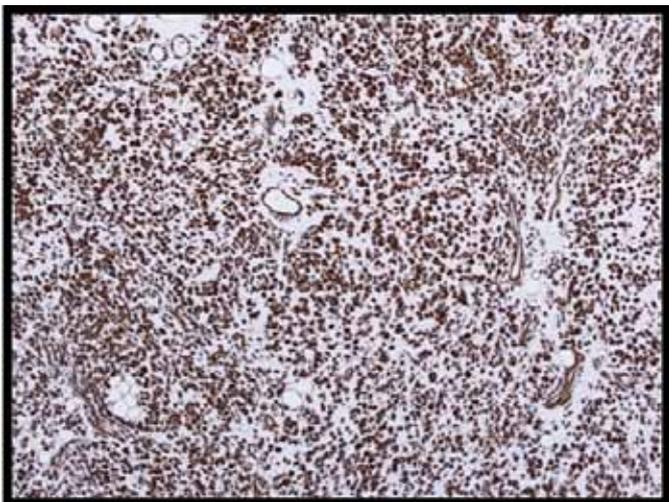


Figure 7: The cells are diffusely positive for Vimentin (immunohistochemistry stain x200).

They have a wide range of morphological and behavioral spectrum from benign things (lipoma) to malignant one (liposarcoma) [1, 2]. Chondroid lipoma is a very rare variant of lipomatous tumors [1, 3]. It had been firstly described by Meis and Enzinger in 1993 [4]. They describe it as a lipoma contains two histological components: a) adipose tissue (containing mature fat cells and lipoblasts), and b) cartilaginous tissue (containing chondroblasts and hyaline matrix) [4]. Now, according to the World Health Organization (WHO) 2002, chondroid lipoma is defined as “a unique and recently recognized benign adipose tissue tumor containing lipoblasts, mature fat cells, and chondroid matrix” [3]. Why does this tumor occur? still unknown, but there are two hypothesis regarding to the origin of the cartilaginous component of this tumor: a) it represents a metaplastic changes in an ordinary lipoma due to a mechanical stress, and b) it arises from the multipotential stem cells under the influence of some growth factors that are present in this lesion [3, 5]. Regarding to the age group, usually this type of tumor will affect adult people in their third and fourth decades [3, 6] but it can arise in pediatric age group also [7]. It arise more in females [3, 6]. Proximal extremities and limb girdles are the most common affected sites, however, trunk and head and neck areas can be affected too [3]. It presented as a painless, slowly growing, superficial or deeply seated soft tissue mass [3, 6].

Grossly, it is a well-circumscribed lobulated tan-yellow mass with a size range of 2–7 cm [3, 6]. Microscopically, the tumor is a well-circumscribed lobulated mass with lobules separated by fibrous septa [3, 6]. Its histological hallmarks are nests and cords of abundant univacuolated and multivacuolated lipoblasts embedded in a prominent myxoid to hyalinized chondroid matrix admixed with a variable amount of mature adipose tissue [3]. Lipocytes are also present [3, 6]. NO/mild pleomorphism and rare mitosis are accepted [3, 6]. Some small cells with

lacunae-like zone are present [3, 6]. No chicken-wire blood vessels in the background but some scattered thick wall blood vessels are noticed [3, 6]. The cells contain both glycogen and lipid which highlighted by PAS and oil-red O stains, respectively [1, 3, 6]. Reticulin stain shows that there is a pericellular reticulin fibers [1–3, 6]. Immunohistochemically, the cells are positive for S100, Vimentin, CD68, and rarely for CK [1, 3, 6]. They are negative for EMA, HMB45, SMA, MSA, GFAP, and CD57 [1, 3, 6]. Ki67 proliferation index is less than 1% [3]. Cytogenetically, some of chondroid lipomas have t(11;16) which resulting in C11 or f95-MKL2 fusion oncogene [2, 3, 6]. How this fusion will lead to the formation of this tumor? Still we have no clear answer.

The differential diagnosis of chondroid lipoma includes benign and malignant tumors [1–3, 6, 8–9]. Myxoid liposarcoma is one of the most mimickers for chondroid lipoma but it can be differentiated by its infiltrative pattern, the presence of chicken-wire blood vessels, and the presence of t(12;16) or t(12;22) which will lead to the fusion of DDIT3 with FUS or EWS1 genes, respectively [2–3, 6]. Myxoid chondrosarcoma is another mimickers for chondroid lipoma but it can be differentiated by its infiltrative pattern, absence of the cytoplasmic vacuoles, absence of the fatty components, and the presence of chromosomal translocation that causing fusion of NR4A3 in chromosome-9 [2–3, 6]. Spindle cell lipoma is one of the differential diagnosis of chondroid lipoma but it have ropey collagen fibers, lack of chondroid background, has diffusely expressed CD34 in the spindle cell component, and a deletion involving chromosomes 13q and 16q [2–3, 6].

It is important to know this type of benign tumor to avoid misdiagnosing it as a sarcoma and the subsequent overtreatment of the patients with radical surgery, chemotherapy, and radiotherapy [1–4, 6, 8, 10, 11]. Chondroid lipoma will be cured with simple excision [3]. It will not recur or metastasis [3].

## CONCLUSION

Chondroid lipoma is a rare variant of lipoma with histomorphological features that mimic myxoid liposarcoma and extra-skeletal myxoid chondrosarcoma. Attention should be paid from the pathologist when he/she evaluates such cases, particularly on core biopsy sample.

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## Author Contributions

Salman T. Al-Malki – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published.

Abdullah S. Al-Khamiss – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published.

## Guarantor

The corresponding author is the guarantor of submission.

## Conflict of Interest

Authors declare no conflict of interest.

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