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Case Report

Dedifferentiated liposarcoma - A case report

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Abstract

Dedifferentiated liposarcoma (DDLPS) is a rare, aggressive subtype of liposarcoma characterized by the presence of both well-differentiated and high-grade sarcomatous components. We present a case of DDLPS diagnosed in a 23 years old male patient with an abdominal mass. This report highlights the clinical presentation, diagnostic workup, treatment, and outcomes of this case.

Keywords: Dedifferentiated, Liposarcoma, Well-differentiated.

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1. Introduction

Liposarcomas are among the most common soft tissue sarcomas, with DDLPS being a distinct entity due to its aggressive behaviour and potential for metastasis. It is most commonly found in the retroperitoneum but can also occur in the extremities and other soft tissue sites. Diagnosis is confirmed through imaging, histopathology, and molecular testing for MDM2/CDK4 amplification.

2. Case Report

A 23 years old male patient with history of epigastric pain for 5 days. On palpation epigastric mass identified which was around 10 x 10 cm, firm to hard in consistency with smooth rounded margins. CECT showed approx. 8.6 x 13 x 9 cm (AP x TR x CC) sized well defined soft tissue density lesion with internal few hypodense area in left lobe of the liver.

2.1. Intervention

Patient underwent resection for removal of the mass.

2.2. Grossly

Specimen weighing 445 grams, total measuring 13.5 x 11.5 x 6.0 cm. On cut section, it is multi loculated and gelatinous in appearance. One cystic area is identified measuring 4.0 x 3.0 cm.

2.3. Microscopic examination

The sections revealed areas of well differentiated liposarcoma, myxoid liposarcoma like, pleomorphic liposarcoma like and high-grade myxofibrosarcoma. Pleomorphic lipoblasts were evident. Mitotic index: 20/ 10 HPF with foci of necrosis. Tumour cells were infiltrating into the skeletal muscles, lymphovascular invasion was not detected. Margins were free from tumour. Histopathological Grade: FNCLCC System- Grade 3 (Tumour differentiation: 3, Mitotic index: 20/ 10 HPF, Necrosis: 1, Total Score: 7). Immunohistochemistry was advised to confirm the diagnosis.

2.4. Immunohistochemistry report

Anti-MDM2: Positive
CDK4: Positive
p16: Positive
p53: Many Positive tumour cells
S 100: Highlighting the lipoblasts
Desmin: Negative
SOX 10: Negative
CD 34: Negative

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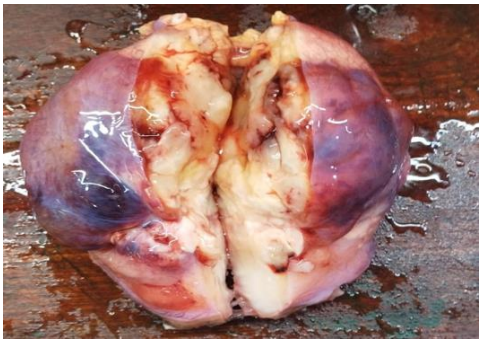

Figure 1: Gross appearance of dedifferentiated liposarcoma with myxoid areas

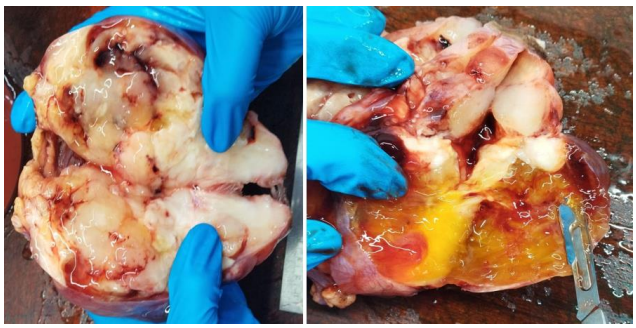

Figure 2: Cut section of the specimen

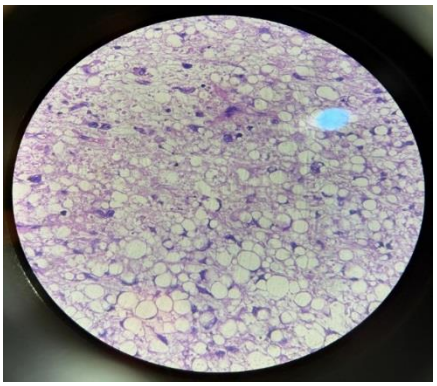

Figure 3: Histopathological section shows atypical lipoblasts with nuclei pushed to the periphery.

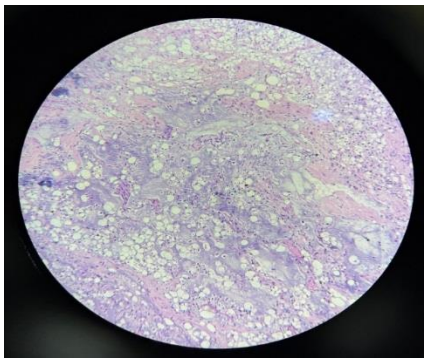

Figure 4: Histopathological section shows areas of dedifferentiated liposarcoma with non-lipomatous part.

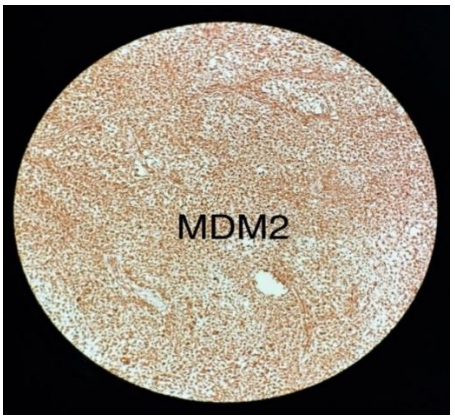

Figure 5: Immunohistochemistry stain MDM2: Positive

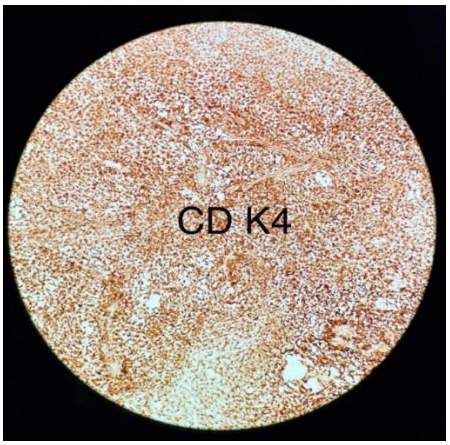

Figure 6: Immunohistochemistry stain CD K4: Positive

Overall findings were reported as Dedifferentiated liposarcoma, high grade differentiation of right anterior abdominal wall with tumor free resected surgical margins. FNCLCC Grading System- Grade 3. AJCC 8th edition pathological stage: T3 Nx Mx (Stage IIIB)

3. Discussion

DDLPS is believed to arise from well-differentiated liposarcoma through the accumulation of additional genetic alterations, most notably MDM2 and CDK4 amplifications.[1] The exact aetiology of DDLPS remains unclear, but it is thought to develop due to progressive dedifferentiation of adipocytic precursor cells, leading to a more aggressive and less differentiated tumor phenotype.[2] Recent studies have also identified alterations in other signalling pathways, such as the PI3K/AKT/mTOR and JAK/STAT pathways, suggesting a broader landscape of molecular aberrations in DDLPS.[6] Environmental and genetic factors may play a role in tumor initiation and progression, though further studies are required to elucidate these mechanisms. Histologically, DDLPS is characterized by a juxtaposition of well-differentiated liposarcoma and high-grade, non-lipogenic sarcoma.[3] The dedifferentiated component often exhibits pleomorphic or spindle-cell morphology, resembling undifferentiated pleomorphic sarcoma or fibrosarcoma.[4] Histopathological evaluation reveals that the well-

differentiated component often mimics mature adipose tissue with scattered atypical stromal cells, whereas the dedifferentiated component is composed of high-grade spindle cells, frequently arranged in fascicles, with marked nuclear pleomorphism and increased mitotic activity.[7] In some cases, heterologous elements such as osteosarcomatous or rhabdomyosarcomatous differentiation can be present, which may influence prognosis and therapeutic response.[8] Immunohistochemically, the tumor cells commonly express MDM2 and CDK4, which serve as key diagnostic markers distinguishing DDLPS from other soft tissue sarcomas.[5] Additionally, next-generation sequencing (NGS) is increasingly utilized to detect additional genetic alterations that may offer therapeutic implications. The presence of these molecular alterations has been crucial in differentiating DDLPS from morphologically similar neoplasms. Targeted therapy against MDM2/CDK4 is currently under investigation, and potential new treatment avenues may emerge.[3] Inhibitors targeting MDM2, such as RG7112 and milademetan, have shown promise in preclinical and early-phase clinical trials.

4. Conclusion

DDLPS remains a challenging soft tissue sarcoma due to its high recurrence rate and limited treatment options.[1] While complete surgical resection remains the cornerstone of management, the role of adjuvant therapies such as radiation and systemic treatments is evolving.[2] Advances in molecular profiling have provided deeper insights into tumor biology, paving the way for novel targeted therapies, including MDM2 and CDK4 inhibitors.[3]

5. Source of Funding

None.

6. Conflict of Interest

None.

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