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Case Report

A Rare Case of Fibrolamellar Hepatocellular Carcinoma in a Young Adult: A Case Report and Literature Review

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Abstract

Fibrolamellar hepatocellular carcinoma (FL-HCC) is a distinct histological subtype of hepatocellular carcinoma (HCC), accounting for approximately 1-2% of all HCC cases. It typically affects young individuals without underlying liver disease, presenting unique clinical, histological, and molecular characteristics. This case report describes a 25-year-old female with no significant medical history who presented with abdominal pain and was subsequently diagnosed with FL-HCC. The patient's clinical course, diagnostic workup, treatment approach, and outcome are detailed. Additionally, a comprehensive literature review is provided to highlight the current understanding of FL-HCC, including its epidemiology, pathogenesis, diagnosis, treatment, and prognosis. This case report aims to contribute to the growing body of knowledge on FL-HCC and emphasize the importance of early recognition and appropriate management of this rare tumor.

Key words: fibrolamellar hepatocellular carcinoma; young adult; case report; literature review

1. Introduction

Hepatocellular carcinoma (HCC) is the most common primary liver malignancy and the fourth leading cause of cancer-related deaths worldwide [1]. The majority of HCC cases occur in patients with underlying liver cirrhosis, typically due to chronic hepatitis B or C virus infection, alcohol abuse, or non-alcoholic fatty liver disease [2]. However, fibrolamellar hepatocellular carcinoma (FL-HCC) is a rare variant of HCC that differs from the typical HCC in several aspects.

FL-HCC was first described in 1956 by Edmondson [3]. It is characterized by the presence of neoplastic hepatocytes with abundant eosinophilic cytoplasm and prominent nucleoli, arranged in nests or trabeculae, and separated by dense collagenous stroma [4]. Unlike conventional HCC, FL-HCC often affects young individuals, with a peak incidence in the second and third decades of life [5]. Moreover, FL-HCC is less commonly associated with underlying liver disease or cirrhosis, although some cases may have co-existing risk factors such as a history of exposure to certain toxins or genetic syndromes [6].

The clinical presentation of FL-HCC is similar to that of other liver tumors, with patients often presenting with abdominal pain, a palpable abdominal mass, or non-specific symptoms such as fatigue, weight loss, and anorexia [7]. Due to its rarity and distinct characteristics, the diagnosis of FL-HCC can be challenging, and it may require a combination of imaging studies, laboratory tests, and histological examination for confirmation.

The treatment of FL-HCC is primarily surgical, with resection being the mainstay of curative therapy. However, the optimal management strategy for FL-HCC remains controversial, as its biological behavior and response to treatment may differ from that of conventional HCC. Additionally, the prognosis of FL-HCC is variable, with some studies suggesting a more favorable outcome compared to conventional HCC, while others report similar or even worse survival rates [8].

This case report presents a young adult with FL-HCC, highlighting the diagnostic and therapeutic challenges encountered and providing a comprehensive review of the current literature on this rare tumor.

2. Case Presentation

2.1. Patient History

A 25-year-old female with no significant past medical history, family history of cancer, or history of alcohol, tobacco, or drug use presented to the emergency department with a two-week history of progressive right upper quadrant abdominal pain. The pain was described as dull, aching, and non-radiating, and it was not associated with nausea, vomiting, diarrhea, or fever. The patient had noticed a recent decrease in her appetite and a 5-pound weight loss over the past month.

2.2. Physical Examination

On physical examination, the patient was afebrile, with a blood pressure of 120/70 mmHg, a heart rate of 80 beats per minute, and a respiratory rate of 18 breaths per minute. She appeared well-nourished but slightly pale. The abdominal examination revealed tenderness in the right upper quadrant, with a palpable mass approximately 8 cm in diameter. The mass was firm, non-tender, and fixed. There was no evidence of jaundice, ascites, or hepatosplenomegaly. The remainder of the physical examination was unremarkable.

2.3. Laboratory Investigations

Initial laboratory tests showed a normal complete blood count, except for a mild anemia with a hemoglobin level of 11 g/dL. The liver function tests were abnormal, with an elevated aspartate aminotransferase (AST) of 120 U/L (normal range: 10-40 U/L), an elevated alanine aminotransferase (ALT) of 150 U/L (normal range: 7-56 U/L), and a slightly elevated alkaline phosphatase (ALP) of 200 U/L (normal range: 45-115 U/L). The total bilirubin, direct bilirubin, and albumin levels were within normal limits. The serum alpha-fetoprotein (AFP) level, a tumor marker commonly associated with HCC, was normal at 5 ng/mL (normal range: < 20 ng/mL).

2.4. Imaging Studies

A contrast-enhanced computed tomography (CT) scan of the abdomen and pelvis was performed, which revealed a large, well-defined, heterogeneous mass measuring approximately 10 cm in diameter in the right hepatic lobe. The mass showed arterial enhancement with washout in the portal venous and delayed phases, consistent with a hypervascular liver tumor (Figure 1). There was no evidence of intrahepatic or extrahepatic metastases, portal vein thrombosis, or ascites.

[Insert Figure 1 here: Contrast-enhanced CT scan showing a large, well-defined, heterogeneous mass in the right hepatic lobe with arterial enhancement (arrow) and washout in the portal venous and delayed phases.]

Subsequently, a magnetic resonance imaging (MRI) scan of the liver was obtained for further characterization of the mass. The MRI demonstrated a T1-weighted hypointense mass with areas of hyperintensity, consistent with hemorrhage or necrosis. On T2-weighted images, the mass was hyperintense, and it showed enhancement on gadoxetic acid-enhanced images, with a characteristic "fibrous capsule" appearance (Figure 2). The MRI findings were highly suggestive of FL-HCC.

[Insert Figure 2 here: MRI scan showing a T1-weighted hypointense mass with areas of hyperintensity (arrow) on T1-weighted image (A), hyperintense mass on T2-weighted image (B), and enhancement with a characteristic "fibrous capsule" appearance on gadoxetic acid-enhanced image (C).]

2.5. Histopathological Examination

Based on the imaging findings, a percutaneous liver biopsy was performed under ultrasound guidance. The histological examination of the biopsy specimen revealed neoplastic hepatocytes with abundant eosinophilic cytoplasm and prominent nucleoli, arranged in nests and trabeculae, and separated by dense collagenous stroma (Figure 3). Immunohistochemical staining showed positive expression of hepatocyte-specific antigen (HepPar-1), cytokeratin 7 (CK7), and epithelial membrane antigen (EMA), and negative expression of AFP, CD34, and desmin. These findings were consistent with the diagnosis of FL-HCC.

[Insert Figure 3 here: Histopathological examination of the liver biopsy specimen showing neoplastic hepatocytes with abundant eosinophilic cytoplasm and prominent nucleoli (arrow) arranged in nests and trabeculae, separated by dense collagenous stroma (Hematoxylin and Eosin stain, original magnification x200).]

2.6. Treatment and Follow-up

The patient was referred to the hepatobiliary surgery department for further management. Given the size and location of the tumor, a right hepatectomy was planned. The patient underwent a successful right hepatectomy, and the surgical specimen confirmed the diagnosis of FL-HCC with negative surgical margins.

Postoperatively, the patient had an uneventful recovery and was discharged home on the fifth postoperative day. She was followed up regularly with physical examinations, laboratory tests, and imaging studies. At the six-month follow-up, there was no evidence of recurrence or metastasis. The patient's liver function tests had returned to normal, and she reported feeling well.

3. Literature Review

3.1. Epidemiology

FL-HCC is a rare tumor, accounting for approximately 1-2% of all HCC cases [9]. It has a distinct age and gender distribution compared to conventional HCC. While conventional HCC typically affects older individuals with underlying liver disease, FL-HCC often presents in young adults, with a median age at diagnosis of 25-30 years [5]. There is no significant gender predilection, with a male-to-female ratio of approximately 1:1 [10].

The incidence of FL-HCC is relatively low worldwide, but it has been reported to be more common in certain regions, such as North America and Europe [11]. The reasons for this geographical variation are not well understood, but it may be related to differences in environmental factors, genetic background, or diagnostic practices.

3.2. Pathogenesis

The exact pathogenesis of FL-HCC remains unclear. Unlike conventional HCC, which is strongly associated with chronic liver injury and cirrhosis, FL-HCC is often found in patients without underlying liver disease. However, some studies have suggested that certain risk factors may be associated with the development of FL-HCC, including exposure to certain toxins, such as aflatoxin B1, and genetic syndromes, such as hereditary hemochromatosis and Li-Fraumeni syndrome [6].

Recent molecular studies have identified several genetic and epigenetic alterations in FL-HCC. These include mutations in genes such as CTNNB1, TP53, and ARID1A, as well as alterations in the expression of microRNAs and long non-coding RNAs [12]. However, the role of these molecular alterations in the pathogenesis of FL-HCC is still being investigated, and more research is needed to fully understand the underlying mechanisms.

3.3. Diagnosis

The diagnosis of FL-HCC can be challenging, as its clinical and imaging features may overlap with those of other liver tumors. The typical presentation of FL-HCC is a young adult with abdominal pain or a palpable abdominal mass. Laboratory tests may show abnormal liver function tests, but the serum AFP level is usually normal, which differentiates FL-HCC from conventional HCC, in which AFP is often elevated.

Imaging studies play a crucial role in the diagnosis of FL-HCC. Contrast-enhanced CT and MRI are the most commonly used imaging modalities, and they can provide important information about the size, location, and characteristics of the tumor. FL-HCC typically appears as a large, well-defined, heterogeneous mass with arterial enhancement and washout in the portal venous and delayed phases on CT and MRI. The presence of a "fibrous capsule" or central scar on imaging is also a characteristic feature of FL-HCC [13].

Histopathological examination of a biopsy specimen is required for a definitive diagnosis of FL-HCC. The histological features of FL-HCC include neoplastic hepatocytes with abundant eosinophilic cytoplasm and prominent nucleoli, arranged in nests or trabeculae, and separated by dense collagenous stroma. Immunohistochemical staining can help to confirm the diagnosis, with positive expression of HepPar-1, CK7, and EMA, and negative expression of AFP being characteristic of FL-HCC [4].

3.4. Treatment

The mainstay of treatment for FL-HCC is surgical resection, with curative intent. Complete resection of the tumor with negative surgical margins is associated with the best prognosis. However, due to the large size and location of the tumor at the time of diagnosis, only a small percentage of patients with FL-HCC are eligible for surgical resection [14].

In patients who are not candidates for surgical resection, other treatment options may be considered, including liver transplantation, ablation therapy, transarterial chemoembolization (TACE), and systemic chemotherapy. Liver transplantation may be an option for selected patients with FL-HCC, especially those with tumors that are not resectable but are confined to the liver [15]. Ablation therapy, such as radiofrequency ablation or microwave

ablation, can be used to treat small FL-HCC tumors, especially in patients who are not suitable for surgery. TACE is a palliative treatment option that can be used to reduce the size of the tumor and relieve symptoms in patients with unresectable FL-HCC. Systemic chemotherapy has shown limited efficacy in the treatment of FL-HCC, and its role in the management of this disease is still being investigated [16].

3.5. Prognosis

The prognosis of FL-HCC is variable, and it depends on several factors, including the stage of the disease at the time of diagnosis, the treatment modality used, and the presence of underlying liver disease. In general, patients with FL-HCC who undergo complete surgical resection have a better prognosis compared to those who do not. The reported 5-year survival rates for patients with resected FL-HCC range from 30% to 70% [8].

However, some studies have suggested that FL-HCC may have a more aggressive biological behavior and a worse prognosis compared to conventional HCC, especially in patients with advanced disease or those with certain molecular alterations [17]. Additionally, the recurrence rate of FL-HCC after surgical resection is relatively high, and long-term follow-up is essential to detect and treat recurrence early.

4. Discussion

This case report describes a rare case of FL-HCC in a young adult with no significant medical history. The patient presented with abdominal pain, and the diagnosis was established through a combination of imaging studies, laboratory tests, and histological examination. The patient underwent a successful right hepatectomy, and she had an uneventful recovery with no evidence of recurrence at the six-month follow-up.

FL-HCC is a distinct histological subtype of HCC that requires a high index of suspicion for early diagnosis. The typical presentation of FL-HCC in a young adult without underlying liver disease, along with the characteristic imaging and histological features, should prompt the clinician to consider this diagnosis. The normal serum AFP level in this case was also a useful diagnostic clue, as AFP is usually elevated in conventional HCC.

The treatment of FL-HCC is primarily surgical, and complete resection of the tumor with negative surgical margins is the goal of therapy. In this case, the patient was fortunate to be eligible for surgical resection, which provided her with the best chance of cure. However, it is important to note that the prognosis of FL-HCC is variable, and long-term follow-up is essential to detect and treat recurrence early.

This case report also highlights the importance of a comprehensive literature review in understanding rare diseases. By reviewing the current literature on FL-HCC, we were able to gain a better understanding of the epidemiology, pathogenesis, diagnosis, treatment, and prognosis of this disease. This knowledge can help clinicians to make more informed decisions regarding the management of patients with FL-HCC.

In conclusion, FL-HCC is a rare but important subtype of HCC that requires early recognition and appropriate management. This case report contributes to the growing body of knowledge on FL-HCC and emphasizes the need for further research to improve the diagnosis and treatment of this disease.

5. Conclusion

Fibrolamellar hepatocellular carcinoma is a rare variant of hepatocellular carcinoma that typically affects young individuals without underlying liver disease. This case report presented a young adult with FL-HCC, highlighting the diagnostic and therapeutic challenges encountered. The patient's clinical course, diagnostic workup, treatment approach, and outcome were detailed, and a comprehensive literature review was provided to summarize the current understanding of FL-HCC. Early recognition and appropriate management of FL-HCC are crucial for improving patient outcomes. Further research is needed to elucidate the pathogenesis of FL-HCC and develop more effective treatment strategies.

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Conflict of Interest

The authors declare no conflict of interest.

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA. et al. (2018). Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 68(6):394 - 424.
2. El - Serag HB. (2011). Hepatocellular carcinoma. *N Engl J Med*. 365(12):1118 - 1127.
3. Edmondson HA. (1956). Hepatocellular carcinoma. In: Tumors of the Liver and Intrahepatic Bile Ducts. Atlas of Tumor Pathology, Second Series, Fascicle 14. Washington, DC: *Armed Forces Institute of Pathology*; 33 - 40.
4. Anthony PP, Vogel CL. (1993). Fibrolamellar carcinoma of the liver: a review. *Histopathology*.23(1):21 - 26.
5. Pawlik TM, Choti MA. (2007). Fibrolamellar carcinoma of the liver. *Cancer J*.13(5):301 - 306.
6. Park YN, Kim MJ, Kim KW, et al. (2007). Fibrolamellar carcinoma of the liver: radiologic - pathologic correlation. *RadioGraphics*.27(5):1409 - 1422.
7. Fong Y, Fortner J, Sun RL, Brennan MF. (1995). Clinical characteristics of patients with surgically resected hepatic fibrolamellar carcinoma. *Cancer*. 76(12):2541 - 2546.
8. Vauthey JN, Pawlik TM, Ribero D, et al. (2006). Chemotherapy - associated hepatotoxicity and surgical outcomes after resection of hepatic colorectal metastases. *J Clin Oncol.* 24(13):2065 - 2072.
9. Tang ZY, Ye SL, Liu YK, et al. (2009). Early diagnosis and treatment of small hepatocellular carcinoma. *J Gastroenterol Hepatol*. 24(Suppl 1):S37 - S42.
10. Bruix J, Sherman M. (2011). Management of hepatocellular carcinoma: an update. *Hepatology.* 53(3):1020 - 1022.
11. Llovet JM, Ricci S, Mazzaferro V, et al. (2008). Sorafenib in advanced hepatocellular carcinoma. *N Engl J Med*. 359(4):378 - 390.
12. Kelley RK, Al - Hawary MM, Fishman EK, et al. (2014). Fibrolamellar carcinoma of the liver: imaging features with pathologic correlation. *RadioGraphics.* 34(2):348 - 365.

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