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Research Article

Non-diabetic, obesity associated fatty liver: Educational ultrasound images and expert opinion

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Abstract

Background: Obesity and diabetes are generally considered the most important risk factors for developing fatty changes in the liver. This paper integrates historical context with contemporary findings, clarifies patient details and treatment approaches, and emphasizes the relevance of recent research in managing fatty liver disease.

Patients and methods: This study includes two patients presented with symptoms suggestive of urolithiasis and underwent abdominal ultrasound. Besides urinary abnormalities, both patients exhibited moderate fatty changes in their livers.

Results: Patient 1, 39-year-old male weighing 100 kilograms, abdominal ultrasound showed a normal-sized liver with moderate fatty changes. There were also coarse crystals within the renal collecting systems of both kidneys. Abdominal ultrasound of the second patient, a 45-year female patient weighing 95 kilograms, showed normal-sized liver with moderate fatty changes. In addition, there were coarse crystals within the renal collecting systems of both kidneys. The evidence-based treatment of fatty liver included oral silymarin and oral metformin.

Conclusion: Based on current evidence, a combination of silymarin and metformin appears promising for managing non-diabetic obese patients with fatty liver disease, offering a potential therapeutic approach for patients without significant hepatic symptoms.

Keywords: fatty liver; a historic overview; ultrasound images; educational article; expert opinion

Introduction

Thomas Addison (Figure-1A), an English physician from Guy's Hospital in London, is credited with one of the earliest reports in 1836 associating fatty liver with excessive alcohol drinking and tuberculosis [1].

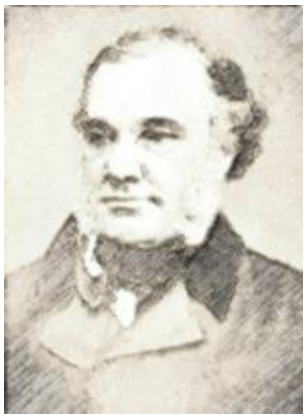

Figure-1A: Thomas Addison (April 1795 - June 1860)

In 1849, Carl von Rokitansky (Figure-1B), an Austrian physician and pathologist, expanded on these associations by describing fatty liver in children with visceral adiposity due to excessive food intake, alongside its connections to tuberculosis and alcoholism [2].

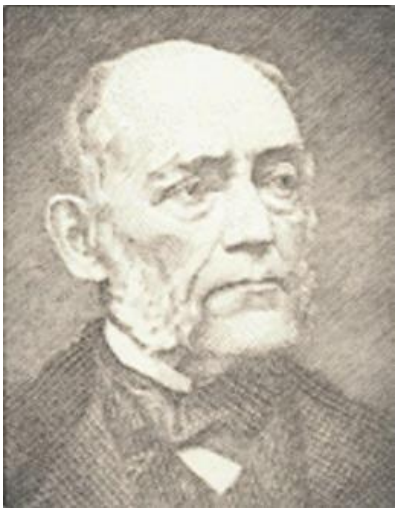

Figure-1B: Baron Carl von Rokitansky (February 19, 1804 - July 23, 1878)

George Budd (Figure-1C), another English physician, in 1857, defined fatty liver as the presence of excess fat in over 5% of hepatocytes, primarily linked with a diet rich in fatty foods in asymptomatic adults [3].

Figure-1C: George Budd (February 23, 1808 - March 14, 1882)

Obesity and diabetes are generally considered the most important risk factors for developing fatty changes in the liver. In 2015, Ludovico Abenavoli from Italy and his research team considered fatty liver that is not related to alcohol to be the most common liver disorder throughout the world. Zobair Younossi from the United States and his international research group emphasized that obesity is the major risk factor for the development of non-alcoholic liver disease [4, 5, 6].

This paper integrates historical context with contemporary findings, clarifies patient details and treatment approaches, and emphasizes the relevance of recent research in managing fatty liver disease.

Patients and methods

This study includes two patients presented with symptoms suggestive of urolithiasis and underwent abdominal ultrasound. Besides urinary abnormalities, both patients exhibited moderate fatty changes in their livers.

Results

Patient 1, 39-year-old male weighing 100 kilograms, abdominal ultrasound (Figure-2) showed a normal-sized liver with moderate fatty changes on ultrasound. No focal lesions or dilatations were observed in the intra-hepatic ducts. The gallbladder was contracted, and there was no evidence of hepatic venous congestion, and the common bile duct was not dilated (4 mm in diameter). The spleen, and pancreas were both normal in appearance.

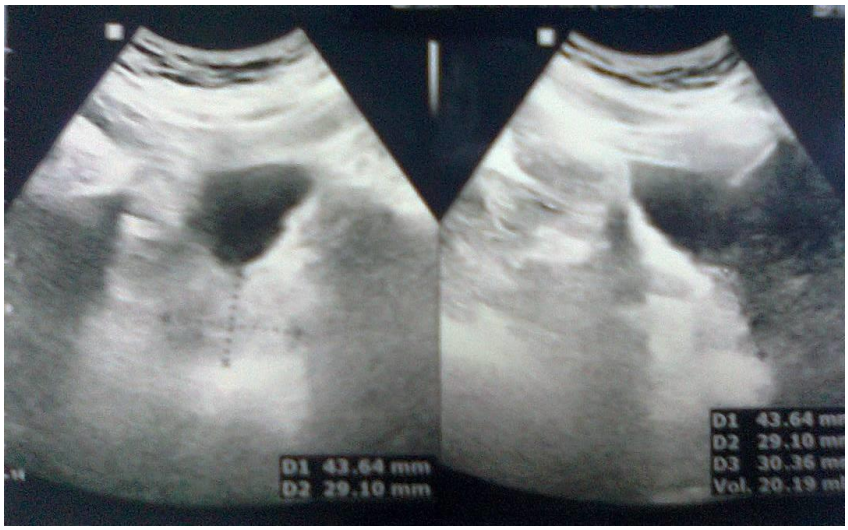

Figure-2A

Figure-2B

Figure-2C

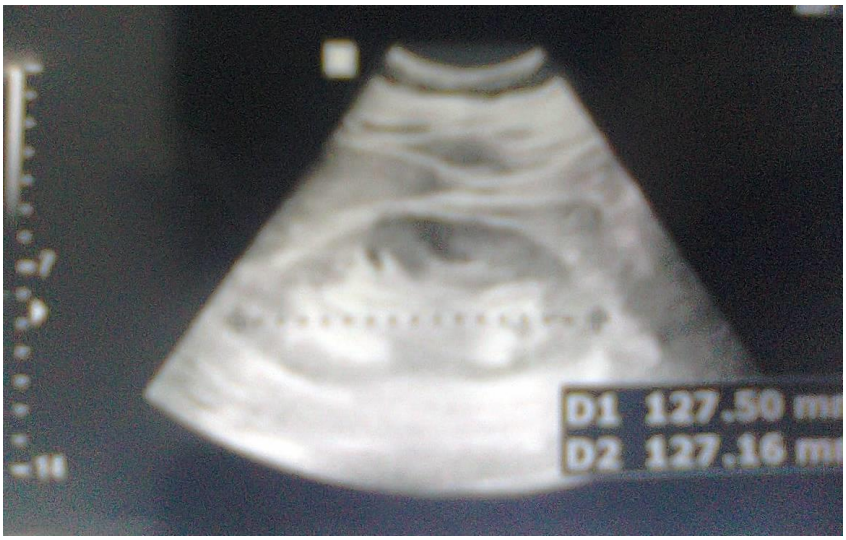

Figure-2D

Both kidneys were normal in size (Right kidney: 12.6 x 5 cm, left kidney: 13.3 x 5 cm), shape and position. Both kidneys had normal parenchyma (Thickness 18 mm) with no pelvi-calyceal dilatation. However, there were coarse crystals within the renal collecting systems of both kidneys. The urinary bladder and prostate both had normal appearance and the prostate volume was 20 milliliters.

Abdominal ultrasound (Figure-3) of the second patient, a 45-year female patient weighing 95 kilograms, showed normal-sized liver with moderate fatty changes. The liver margin was smooth and there was neither focal lesion nor dilatation of the intra-hepatic duct. The gall bladder had normal capacity and normal thickness with no abnormality. There was no evidence of hepatic venous congestion, and the common bile duct was not dilated (4 mm in diameter). The spleen and pancreas were both normal in appearance.

Both kidneys were normal in size (Right kidney: 11.6 x 5 cm, left kidney: 11.3 x 5 cm), shape and position. Both kidneys had normal parenchyma (Thickness 18 mm) with no pelvi-calyceal dilatation. Renal ultrasound also showed two renal sinuses suggesting bifid collecting systems. In addition, there were coarse crystals within the renal collecting systems of both kidneys.

The urinary bladder had normal appearance, and a normal vaginal cap was seen (9.5 mm) but the uterus and both ovaries were not seen because of surgical removal.

For the coarse urinary crystals, both patients received oral essential oil terpenes (Urinex) based on the evidence provided and presented by Al-Mosawi AJ [7, 8, 9, 10]. For the fatty liver changes, both patients received oral silymarin (Legalon) 75 mg once daily was prescribed based on the evidence provided by Buturova and colleagues (2010), Luis (2015) [11,12].

Both patients received also an initial dose of 500 mg daily of oral metformin to help with weight reduction based on the evidence provided by Schwimmer et al (2005) and Seifarth and colleagues (2013) [13,14].

Discussion

Obesity associated fatty liver has been reported as early as the 1800s [2.3]. As early as 2005, Colicchio et al from Italy emphasized that obesity per se can increase the risk of liver disease. They reported the usefulness of abdominal ultrasound in the detection of fatty liver (steatosis), and the classification of the severity into mild, moderate, and severe in non-diabetic obese patients [15].

In 2024, Li et al from China performed systematic review and meta-analysis which included 26 controlled studies involving 2375 patients. The review and analysis showed that silymarin can attenuate liver damage and markedly improve hepatic steatosis on liver histology study [16].

Figure-3A

Figure-3B

Figure-3C

Figure-3D

The use of metformin in non-diabetic obesity has been increasingly suggested [17]. As early as 2005, Bugianesi et al from Italy considered metformin to have a proven usefulness in the treatment of nonalcoholic fatty liver disease. They reported a one-year study which included non-diabetic patients; 55 patients received metformin 2000 mg daily, 28 patients received vitamin E 800 IU daily, and 27 treated by a dietary intervention to lower weight. The study showed the superiority of metformin over dietary therapy and vitamin E [18].

Conclusion

The association between obesity and fatty liver has been recognized since the 1800s. Recent studies, such as those by Colicchio et al. and Li et al., emphasize the utility of abdominal ultrasound in detecting and classifying fatty liver severity. Silymarin has shown promise in attenuating liver damage and improving hepatic steatosis, while metformin has been increasingly considered for its benefits in non-diabetic obese patients.

Based on current evidence, a combination of silymarin and metformin appears promising for managing non-diabetic obese patients with fatty liver disease, offering a potential therapeutic approach for patients without significant hepatic symptoms.

Acknowledgment

The author has the copyright of the sketch in this paper.

Conflict of interest: None.

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