

Rapid Progression of MAFLD to Cirrhosis in a Young Obese Female with Polycystic Ovarian Syndrome (PCOS)

Background

Polycystic Ovarian Syndrome (PCOS) is a common endocrine disorder in young women, strongly linked with obesity and insulin resistance. These metabolic problems increase the risk of Metabolic-Associated Fatty Liver Disease (MAFLD). While MAFLD usually progresses slowly, in some patients it can advance rapidly to non-alcoholic steatohepatitis (NASH) and cirrhosis. In South Asia, where obesity and PCOS are very common, this overlap is often missed, as most women with PCOS are managed by gynecologists or endocrinologists without routine liver screening. Early detection is important to prevent progression to cirrhosis at a young age.

Case Presentation

A 24-year-old woman presented with abdominal swelling and irregular menstrual cycles. She had a history of PCOS for 3 years and was obese, with a BMI of 34. On examination, she had central obesity, acanthosis nigricans, mild hepatomegaly, and ascites.

Investigations revealed raised liver enzymes (ALT 96 U/L, AST 85 U/L).

Ultrasound showed a coarse, nodular liver with ascites, and FibroScan demonstrated advanced fibrosis (18.5 kPa, F4 cirrhosis). Hormonal tests confirmed PCOS, while viral, autoimmune, and metabolic causes of chronic liver disease were excluded.

Liver biopsy revealed macrovesicular steatosis, ballooning degeneration, and bridging fibrosis, consistent with NASH-related cirrhosis.

Final Diagnosis: MAFLD-related cirrhosis secondary to obesity and PCOS.

Management

Ascites: Treated with spironolactone and furosemide, with fluid and salt restriction.

Metabolic control: Continued metformin for insulin resistance; GLP-1 receptor agonist was considered for weight loss and additional metabolic benefit.

Lifestyle modification: Calorie-restricted Mediterranean diet, structured physical activity, and behavioral counseling.

Preventive care: Vaccination for hepatitis A and B; nutritional supplementation.

Multidisciplinary approach: Hepatology, endocrinology; gynecology, and nutrition specialists involved in care.

Definitive management: Enlisted for liver transplantation due to early decompensation

Discussion

This case highlights how obesity and PCOS can act together to accelerate MAFLD progression, leading to cirrhosis at an unusually young age. Such cases are often overlooked because PCOS patients are usually followed for reproductive and endocrine issues, not liver disease. Routine screening for fatty liver in PCOS patients could allow early intervention and prevent cirrhosis.

Conclusion

PCOS with obesity represents a high-risk group for aggressive MAFLD progression. Early screening, lifestyle modification, and multidisciplinary care are essential to prevent advanced liver disease in young women.