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Case report

Liver failure and transplantation after duodenal switch

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Abstract

Liver failure (LF) and liver transplant (LT) are rare after a biliopancreatic diversion/duodenal switch procedure for obesity, but occasionally it may happen. Two clinical cases are presented. One patient, 18 years ago, had LF, but a liver donor could not be found, and the patient died. The second patient, 2 years ago, received a successful LT and is now well and asymptomatic. Careful follow-up, medical management and surgical intervention may prevent the occurrence of LF. Transplantation and bowel reversal may be necessary. (*Surg Obes Relat Dis* 2014;■:00–00.) © 2014 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords:

Biliopancreatic diversion; Duodenal switch; Liver failure; Liver transplant

Morbid obesity (MO) is a condition reaching epidemic proportions all over the world. Bariatric surgery is the most effective management of MO.

Nonalcoholic fatty liver disease (NAFLD) has become the most common cause of chronic liver disease worldwide [1]. Nonalcoholic steatohepatitis (NASH) represents 1 of the most common histologic findings in MO patients undergoing liver biopsy. NAFLD usually improves with bariatric surgery, but occasionally NAFLD may appear after the bariatric procedure [2].

Histologic features of NASH (steatosis, necroinflammatory activity, and portal fibrosis) are similar to those found in other conditions such as liver disease after jejunoileal bypass and alcoholic fatty liver. The mechanisms of injury on the MO remain undefined and the risk of progression to cirrhosis is controversial [3].

Unrecognized or recognized cirrhosis is not necessarily an absolute contraindication to bariatric surgery, provided there is good hepatic function and no evidence of severe portal hypertension (corrected portal pressure <12 mm Hg). NASH-related cirrhosis has been shown to improve

with all forms of bariatric surgery. The best option in many of these patients appears to be a restrictive procedure [4].

Biliopancreatic diversion/duodenal switch (DS) is probably the more effective operation to treat MO with the best long-term results related to weight loss [5–7]. Prachand et al. [8] had 54% excess weight loss with gastric bypass and 68% with DS while Strain et al. [9] reported a 16.5 BMI drop in the gastric bypass and 23.8 with the DS. Liver failure (LF) and liver transplant (LT) has been rarely reported after DS [10].

Baltasar et al. [11] in 2004 reported 10 cases of severe liver impairment on 470 MO patients operated with DS (93 of them laparoscopic DS) followed during 9 years and 1 patient had LF.

Case reports*Case #1*

A 41-year-old woman with a body mass index (BMI) of 58 (kg/m²) had a DS in April 1995, and she had a very large fatty liver. The alimentary limb (AL) was 260-cm long and the common channel (CC) was 65 cm. She did well until June 1995, 3 months later, when she was readmitted to a university hospital for persistent vomiting and had a BMI of 48. Liver function tests were abnormal (AST-155 IU/L;

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ALT-91; AP-621 IU/L), and at this time a percutaneous liver biopsy showed NASH (grade III steatohepatitis without necroinflammatory activity or portal fibrosis). In August 1995, she was readmitted with a BMI of 39, and she was treated successfully with total parenteral nutrition and biliary and pancreatic supplements and had a liver biopsy of mild NASH.

She was readmitted again in October 1995 with severe jaundice and alteration of liver function tests (TBil-18.9, DBil-12.6, ALT-123, AST-236, AP-644, INR-1.64) and was transferred to a transplantation service with progressive alteration of bleeding profile. The clinical course of the patient rapidly worsened with encephalopathy. She was urgently placed in red-call alert for transplant, but she died of LF while waiting for a LT donor (no postmortem liver examination is available).

Case #2

A 33-year-old, female with a BMI of 49 had uneventful LDS in March 2008 with a 260-cm AL and 65-cm CC. Five months later, she was healthy and asymptomatic with a BMI of 26. On November 2009, 20 months after the initial surgery, she became progressively jaundice with T-bilirubin-508 (0–18 $\mu\text{mol/L}$), direct bilirubin-217 (0–8 $\mu\text{mol/L}$), prothrombin time-17, INR-6.5. LF with brain symptoms developed within a week, and she went into coma. She received an orthotopic liver transplant. The pathologic report at the time of LT was disappearance of hepatocytes, cholangiolar metaplasia, and severe bile stasis. The AL length was increased while the BPL was shortened to make a CC > 200 cm. Today, 4 years later, her albumin is 3.4, she is asymptomatic with a BMI of 23, and her liver profile is normal.

Discussion

LF leading to death or LT after bariatric surgery is rare. Castillo et al. [12] reported the first successful LT after BPD on a MO (BMI 46) female patient who lost 2 kg in 2 months (BMI 38) and had a BMI of 28 at 6 months and subacute hepatitis was diagnosed. A transjugular hepatic biopsy demonstrated submassive hepatic necrosis, early nodule formation, periportal and lobular neutrophilic infiltrates, and cholestasis. Her condition deteriorated; facial edema and general confusion developed; and later, grade III and IV encephalopathy and flapping appeared, together with 15% prothrombin activity and 5% factor V activity resulting in LF 1 year after BPD. She underwent orthotopic LT in April 2000, using the piggyback technique, and she recovered. During the operation, an ileum-jejunal side-to-side anastomosis was constructed, shortening the total diversion length to only 40 cm.

Lowell et al. [13] wrote about the jejunoileal bypass (JIB) a MO technique, developed in the late 1960s, but is now

abandoned because of a high rate of complications, including cirrhosis. Lowell et al. [13] reviewed their experience of JIB and LT in 380 consecutive adult patients since 1985, and 4 patients underwent LT. The mean duration of time from JIB to LT was 22.3 years. All patients had complications, in addition to their liver disease, related to the JIB, which included nephrolithiasis, cholelithiasis, vitamin deficiencies, renal insufficiency, and d-lactic acidosis. One patient had the JIB taken down before LT, which precipitated acute liver and renal failure, necessitating urgent transplantation. One patient, who had the JIB taken down at the time of LT, developed recurrent MO, while the other 3 patients did not. The patient who did not have the JIB taken down did not develop recurrent liver disease and has been followed-up with monthly liver function tests and yearly biopsies. Lowell et al. [13] concluded that the incidence of patients who require LT after JIB might be on the increase. Takedown of the JIB may also precipitate acute liver failure in the cirrhotic patient. JIBs takedown should be accomplished either at the time of LT or after LT. The LT patients with decompensated cirrhosis after JIB have demonstrated excellent early results. LT recipients are also at risk for recurrent MO after takedown of the JIB.

Våge et al. [14] reviewed 36 JIB patients, from 1971–1976 at >25 years. Ten patients (28%) had their shunt reversed. With 1 exception, these patients quickly regained weight, and 5 (50%) of them died. Meanwhile 23 patients with an intact JIB were alive. When the optimal shunt length for the individual patient is found, JIB maintains a substantially reduced weight for 25 years. Vitamin and mineral deficiencies are common, but no serious clinical deficiency states were seen. Still, no bariatric group recommends JIB any longer.

Geerts et al. [15] surveyed LT incidence after MO surgery in Belgium. An enquiry was sent to all Belgian liver transplant centers to investigate the occurrence of subacute and chronic LF after bariatric surgery. After weight-reduction surgery, 10 patients in 3 Belgian transplant centers were listed for LT due to severe hepatocellular failure. Nine of them had undergone a Scopinaro BPD operation, and one had a JIB. The median time to develop LF was 5 years. The patient with JIB developed chronic LF after 25 years. Seven patients received transplants, 2 died awaiting a graft, and 1 is still on the waiting list. After LT, 1 patient developed rapid reappearance of LF at 10 months, requiring retransplantation. Two recipients died shortly after LT due to multiorgan failure. The remaining recipients were doing well. According to this survey, the BPD operation carries a potential risk of LF. However, because there were only 10 cases, the actual incidence of BPD-induced LF is unknown. He advised strict follow-up of liver function and timely dismantling of BPD. Grimm et al. [16] also reported a BPD patient who developed steatohepatitis and subsequently died of LF.

Sgambato et al. [17] had a 42-year-old woman (BMI 54) who underwent biliointestinal bypass (BIB) for severe obesity

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