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## Editorial

### Bariatric surgery in liver transplant: Current trends and future perspectives<sup>☆</sup>



### *Cirugía bariátrica en trasplante hepático: tendencias actuales y perspectivas futuras*

Morbid obesity is a major public health problem due to the negative impact on patients in terms of comorbidities and mortality<sup>1</sup>. Currently, 36% of American adults are obese, with significant individual and social health implications. Obesity is considered to have a multifactorial cause which affects patients across a spectrum of cardio-metabolic diseases including; liver disease such as Non-Alcoholic Fatty Liver Disease (NAFLD) and Non-Alcoholic Steato-Hepatitis (NASH) (4,5). Global estimations of prevalence of NAFLD and NASH are 30% and 5% respectively, with 20% of NASH patients progressing to End Stage Liver Disease (ESLD).

According to a recent clinical update, there is no definitive treatment for NAFLD<sup>2</sup>. However, among the medical treatment available, consensus and guidelines has been established that lifestyle changes, the use of medications (metformin, thiazolidinediones, antioxidants, incretin-based therapy, lipid lowering agents, orlistat, lorcaserin, naltrexone/bupropion, phentermine/topiramate, liraglutide and pentoxifylline) and bariatric surgery help to improve patient's functional status and avoids disease progression, which has been associated to better clinical outcomes.

During the last 5 years, NASH has become one of the most frequent causes of liver transplantation, not only in the United States of America but also worldwide<sup>3</sup>. The clinical context of patients with NAFLD is often complicated due to comorbidities that they usually present. Although, it is well known that obesity plays an important part in the development of NASH, the role of bariatric surgery in these patients is still unclear. The principal hypothesis is, if risk factors for its development

are under control, the clinical outcomes of this condition can be improved<sup>4</sup>.

There remains debate around the optimal time for bariatric surgery, intention to treat or minimize disease progression to NASH and liver transplantation. Patients with these medical conditions ought to be evaluated and treated in a multidisciplinary medical team<sup>5</sup>. Although bariatric surgery is the best therapeutic alternative for the management of weight loss and comorbidities, with low complication rates (2%), it is not the initial alternative for patients with NASH. Liver cirrhosis and portal hypertension are commonly contraindications to bariatric surgery as clinical studies have showed an important increase in mortality rates<sup>6</sup>.

In patients with ESLD and undergoing elective transplantation, bariatric surgery has shown to be effective to prevent recurrent disease and improve postoperative outcomes<sup>6,7</sup>. There are three clinical scenarios for the management of this population of patients; bariatric surgery before liver transplantation, during liver transplantation or after transplantation. The timing scenarios each have advantages and disadvantages, and there is a lack of data and robust studies that define the best timeframe to treat these patients<sup>7</sup>.

Patients who undergo bariatric surgery before liver transplantation may develop nutritional deficiencies secondary to the anatomical variations of the digestive tract as it can lead to poor absorption of nutrients<sup>8</sup>. Bariatric surgery also results in decreased oral intake, secondary to restriction and increased satiety. Some patients may have transient or prolonged food intolerance. Data has shown that over time these events can

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modify the immunological status of the patient and place at risk the results of the liver transplant. Additionally, results suggest an increasing short-term mortality rate in this group of patients<sup>9</sup>.

*Liver transplantation and bariatric surgery can be performed simultaneously.* In this scenario, Sleeve Gastrectomy (SG) is the most commonly performed procedure. SG decreases the risk of leak complications, there is no direct impact on the process of absorption of nutrients, allows direct endoscopic access to the stomach and the biliary tree since this is preserved. As such, the weight loss is typically more gradual when compared to other surgical techniques<sup>10,11</sup>. From a technical standpoint, SG can be performed concomitantly in shorter operative times and lower level of surgical complexity, exposing the patient to reduced risks. Performing the operations simultaneously may result in better resource utilization where the patient will only be exposed to anesthesia once and have one single post-operative and recovery period<sup>11</sup>.

In existing data, the clinical outcomes observed include excellent weight loss, diabetic improvement and no changes in complication rates during the first 30 days when compared to transplant alone. Moreover, patients have lower prevalence of hypertension, improvement of insulin resistance and a decrease in the use of medications for the management of hyperlipidemia. There are no changes in terms of overall patient mortality or graft success rates<sup>12</sup>.

The third clinical scenario is the performance of the *bariatric surgery procedure after liver transplantation*. Timing of bariatric procedure may be variable and some authors recommend the second procedure to be performed at least one year after the liver transplantation<sup>13</sup>. The clinical results in terms of comorbidity resolution are comparable to the other scenarios which has been described. However, during the time that elapses between transplantation and bariatric surgery, patients may not have good control of comorbidities and there is risk of NASH recurrence<sup>14</sup>. Complication rates are similar, yet the more severe complications are seen in these series, as these patients are in a state of immunosuppression to conserve the transplanted organ and are under chronic use of corticosteroids. Several immunosuppressant drugs have secondary effects such as hypertension and lipid alterations which may result in post-transplantation metabolic syndrome<sup>14</sup>. From the surgical and technical perspective, reports claim the procedures are more complex, since the previous abdominal surgery leads to the generation of adhesions in the abdomen hindering organ mobilization and visualization<sup>15</sup>.

In conclusion, liver transplantation is often the most effective and only treatment for NASH and ESLD, and bariatric surgery is the most effective and durable treatment for obesity and metabolic diseases, however, clinical studies with considerable sample size and/or adequate follow-up are still needed. Currently there is no consensus or guidelines that define the medical approach of this population. Evaluation and treatment should take place in a center with experience in both areas and under the auspices of a multidisciplinary team.

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