

Obesity, alcohol use, and decreased blood clotting associated with return to operating room after liver transplant

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Liver transplant surgery is a vital and life-saving procedure, but it also is associated with a high rate of postoperative complications. As many as one in four liver transplant patients will return to the operating room (R-OR) within 48 hours of their initial surgery.

However, recently published research shows that certain [risk factors](#) can indicate a more likely R-OR, allowing patients, clinicians, and [family members](#) to more comprehensively prepare for this possibility.

Liver [transplant](#) recipients with a [body mass index](#) (BMI) higher than 30, or what is considered obesity, who were matched with livers from donors with a history of heavy alcohol use saw an 80% R-OR rate. Further, researchers found that a triad of obesity, heavy alcohol use, and coagulopathy, or a decreased ability to form [blood clots](#) and stop bleeding, were associated with a 100% R-OR.

"What this tells us is that if possible, we should try to not match a recipient with obesity with a donor who has a history of alcohol use," explains Hunter Moore, MD, Ph.D., principal investigator on the study and an assistant professor of transplant [surgery](#) in the University of Colorado School of Medicine. "If we can't minimize the risk, then we'll try to really manage the recipient's coagulopathy—manage it more aggressively than if they didn't have those risk factors."

Risk associated with return to OR

The research data was drawn from [liver](#) transplant recipients enrolled in a Colorado Multi-Institutional Review Board study to prospectively collect [blood samples](#) through the first 24 hours following surgery.

"We noticed a much higher rate of return to the [operating room](#) in certain populations, mostly patients with obesity," Moore says. "We wanted to know if obesity was a real risk factor and what additional kind of factors were associated with it, and to see if any of those were modifiable to reduce the risk of needing a second operation."

One of the main reasons that liver transplant recipients require a second surgery is having a hematoma, or pool of mostly clotted blood, form around the new liver. "During the transplant operation the liver is a little slow and takes a while to wake up, which results in slow coagulopathic bleeding which causes blood to coagulate around it," Moore explains. "It's not very harmful, but when there's a lot of it, it puts pressure on the liver and can slow its recovery."

Moore and his co-researchers analyzed data from 160 liver transplant recipients and found that 80% of those with a BMI of 30 or higher who received a liver from a donor who drank two or more servings of alcohol per day were back in the OR within 48 hours of their first surgery. Every patient with those two risk factors and the added factor of coagulopathy returned to the OR within 48 hours.

Understanding risk factors

"The issues with returning to the OR are not really related to any detriment to survival and function," Moore says. "But because it happens with one in four [liver transplant patients](#), if you can reduce that number it's much better for patients' recovery and it reduces the burden on OR

staff."

These research findings will allow patients, their caregivers, and surgical teams to plan for R-OR or even to mitigate risk before surgery.

"When I see my pre-evaluation liver transplant patients, if they have a BMI that's 30 or higher I let them know that if they can work toward getting their BMI below 30 it may reduce their risks of returning to the OR and improve their outcomes," Moore says. "Another way to mitigate risk is to fix coagulation in the OR aggressively. We can pre-emptively transfuse them with more hemostatic blood products if we know their coagulopathy risk before surgery."

Further research will study risk factors more associated with donors and donated livers. For example, Moore has recently begun studying levels of transaminase, an enzyme, in donor livers, which may be associated with an elevated risk of fluid build-up in the belly following transplant surgery.

"One of our main goals is to better understand risk factors so that we can anticipate outcomes and better plan for them during and after surgery," Moore says.

More information: Hunter B. Moore et al, The vexing triad of obesity, alcohol, and coagulopathy predicts the need for multiple operations in liver transplantation, *The American Journal of Surgery* (2022). [DOI: 10.1016/j.amjsurg.2022.02.053](https://doi.org/10.1016/j.amjsurg.2022.02.053)

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