

Researchers identify cause for lower-extremity overgrowths in obese patients

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Morbidly obese individuals—those whose weight is more than double normal weight—are prone to overgrowths in their lower extremities that can lead to infections and other health-threatening complications. Little was previously known about the underlying causes of this condition, and conventional treatment has involved surgical removal of these overgrowths. However, a new study published online as an "article in press" ahead of print in the *Journal of the American College of Surgeons* has identified the underlying cause for these overgrowths, and the researchers recommend that weight loss, not a surgical procedure, be the preferred initial treatment for these patients.

The researcher team, led by Arin K. Greene, MD, MMSc, FACS, a plastic surgeon at Boston Children's Hospital, Harvard Medical School, developed a probability scale that can help physicians identify patients at greatest risk of this condition, known as massive localized lymphedema (MLL). This study is the first to identify the cause of MLL as obesity-induced lymphedema (OIL), and it builds upon previous work Dr. Greene and colleagues have published in which they identified OIL as a disease resulting from obesity.

"The major clinical takeaway for physicians is that if they have a patient with massive localized lymphedema, the individual has an underlying disease called obesity-induced lymphedema and the initial treatment should be [weight loss](#)," Dr. Greene said. "Surgeons should consider removing one of these massive growths only after the patient has lost significant [weight](#), because the risk of recurrence is lower and the

operation is much safer."

Body-mass index (BMI) is a measure that determines an individual's weight status. It is the ratio of one's weight in kilograms to the square of height in meters (kg/m^2). BMI of $25 \text{ kg}/\text{m}^2$ is considered normal, between 25.1 and $29.9 \text{ kg}/\text{m}^2$ overweight, and $30 \text{ kg}/\text{m}^2$ or greater obese. Once an individual's BMI exceeds $50 \text{ kg}/\text{m}^2$, the lymphatic system in the legs becomes damaged and patients develop lower extremity swelling, known as obesity-induced lymphedema. Over time, massive overgrowths can occur in these patients; the higher the BMI, the greater the risk.

The Boston Children's-Harvard study involved 82 obese patients who underwent lymphoscintigraphy, a nuclear medicine test for evaluating lymph drainage, to evaluate lower extremity lymphatic function between 2009 and 2016. Seventeen were diagnosed with MLL, and all of them had underlying OIL. Their median BMI was $66 \text{ kg}/\text{m}^2$, ranging from 62 to $78 \text{ kg}/\text{m}^2$, with a median age of 61 years (median age of controls who did not have MLL was 55 years). Patients with a BMI greater than $56 \text{ kg}/\text{m}^2$ had a 213 greater odds of developing MLL than patients with lower BMI. Dr. Greene pointed out that lymphoscintigraphy "is very accurate in determining if the lymphatic vessels in the lower extremities are functioning properly."

"An important finding of the study is that we can now counsel patients with OIL who have not yet developed MLL about the likelihood that they will develop MLL if they do not lose weight," Dr. Greene said. The study researchers developed a probability scale that identifies a patient's risk for developing MLL: a 4 percent chance at $40 \text{ kg}/\text{m}^2$; 15 percent at $50 \text{ kg}/\text{m}^2$; 40 percent at $60 \text{ kg}/\text{m}^2$; 75 percent at $70 \text{ kg}/\text{m}^2$; and 92 percent at $80 \text{ kg}/\text{m}^2$.

The key is that morbidly obese [patients](#) with significant MLL overgrowths should undergo counseling for weight loss—non-surgical at

first, then bariatric surgery if that fails—before undergoing an operation to remove the MLL overgrowths. "In our center, individuals with obesity-induced lymphedema, with or without MLL, are referred to a bariatric surgical center to treat the underlying cause of their lymphatic function, which is their weight," Dr. Greene said. "Not only will weight reduction prevent the occurrence of MLL, but it will significantly shrink the area of overgrowth and facilitate its resection."

More information: Massive Localized Lymphedema: A Case-Control Study. *Journal of the American College of Surgeons*, 2016.

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