

THE MALNOURISHED METABOLIC SYNDROME THAT REDEFINES DIABETES CARE



In clinical practice, diabetes is often viewed through a binary lens, type 1 or type 2. One involves autoimmune beta-cell destruction, the other insulin resistance commonly tied to obesity and sedentary lifestyles. Yet in regions marked by undernutrition and poverty, a different patient profile frequently emerges: underweight adolescents and young adults, presenting with severe hyperglycemia, minimal or no ketosis, and a puzzling resistance to standard treatment. For decades, these patients have eluded conventional classification. Now, the International Diabetes Federation (IDF) has formally recognised this distinct entity as Type 5 diabetes, a condition that challenges many long-held assumptions about diabetes pathophysiology and management.

A distinct clinical phenotype comes into focus

Type 5 diabetes, previously referred to as Malnutrition-Related Diabetes Mellitus (MRDM), is now defined by a unique set of clinical and biochemical features. It primarily affects young individuals—often male—who have experienced chronic nutritional deprivation during childhood and adolescence. These patients typically present with low body mass index, fatigue, stunted growth, and poor glycemic control, yet they do not exhibit the hallmark features of either type 1 or type 2 diabetes.

Autoimmune markers such as GAD antibodies are negative, ruling out classic type 1 diabetes. Nor is there significant insulin resistance, a defining trait of type 2. Instead, the core dysfunction lies in pancreatic underdevelopment, resulting in impaired insulin secretion rather than insulin resistance or destruction. Compounding the diagnostic difficulty is the relative rarity of ketoacidosis in these patients, a factor that often leads clinicians to misclassify the condition or assume non-compliance with treatment.

Diagnosis by exclusion: a clinical and contextual challenge

At present, there are no standardized laboratory criteria for diagnosing type 5 diabetes. The IDF's type 5 working group is in the process of developing formal guidelines, but until then, clinicians must rely on clinical judgment and exclusion-based diagnosis.

Suspicion should be high in cases involving underweight, young patients with hyperglycemia, no family history of diabetes, borderline or low c-peptide levels, and an unusual response to both insulin and oral agents. The absence of autoimmunity and insulin resistance should prompt further evaluation, particularly in patients from regions where early-life malnutrition is common.

This requires a shift in clinical thinking. Historically, diabetes has been approached as a condition of metabolic excess—too much sugar, too much insulin resistance. Type 5 diabetes, in contrast, is a disease of metabolic deprivation, where inadequate early-life nutrition impairs the endocrine system's ability to function normally. For the clinician, this means digging deeper into nutritional history, socioeconomic status, and childhood growth patterns—as important as blood glucose readings or HbA1c.

A paradigm shift: nutrition before medication

Perhaps the most profound implication of this new classification is the reordering of treatment priorities. For type 5 diabetes, nutrition is not an adjunct therapy—it is the primary intervention. Unlike other forms of diabetes, where pharmacologic control of hyperglycemia is the immediate goal, type 5 diabetes demands a foundation of nutritional rehabilitation.

The initial phase of treatment involves a high-calorie, protein-rich diet, fortified with essential micronutrients such as zinc, iron, and vitamin B12. These nutrients support pancreatic regeneration, muscle rebuilding, and overall metabolic repletion. Only once basic nutritional status improves should pharmacotherapy be considered—and even then, with caution.

Agents like glimepiride may be introduced at very low doses, and insulin titration must be slow and tightly monitored. The risk of hypoglycemia is disproportionately high in these patients due to their low glycogen stores and lean muscle mass. A regimen that would be standard in an obese type 2 patient can be catastrophic in someone with a BMI of 16 and minimal physiological reserve.

This shift forces a reconsideration of treatment reflexes. A 20-year-old with blood glucose of 250 mg/dl and visible wasting is not an automatic candidate for basal-bolus insulin or DPP-4 inhibitors. Instead, the first prescription should

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NEW MEDICAL DEVICES

1. FDA approves first DHE autoinjector for acute migraine and cluster headache relief

In a groundbreaking advancement for migraine and cluster headache treatment, the U.S. Food and Drug Administration (FDA) has approved Brekiya, the first dihydroergotamine mesylate (DHE) autoinjector, for adult patients experiencing acute episodes of migraine with or without aura and cluster headaches. The approval was officially announced on May 15, 2025, and marks a major milestone in the evolution of patient-administered migraine therapies.

Developed by Amneal Pharmaceuticals, Brekiya offers the same active compound DHE mesylate that has long been used in hospital settings, now delivered in a ready-to-use subcutaneous autoinjector. This user-friendly format enables self-administration, eliminating the need for complex preparation or cold-chain storage.

"The DHE autoinjector is a really important milestone for patients living with acute migraines and cluster headaches," said Joe Renda, Senior Vice President and Chief Commercial Officer, Speciality at Amneal Pharmaceuticals, in a statement to NeurologyLive®. For the first time, it puts

this type of treatment into a ready-to-use autoinjector that patients can administer themselves—giving them more control and the ability to act quickly during these painful attacks.

Brekiya is designed to deliver a 1 mg dose directly into the thigh, with no requirement for refrigeration, assembly, or priming. This innovation is particularly significant for patients who struggle with oral therapies, either due to inefficacy or complications such as nausea, vomiting, or the need for rapid relief that oral medications can't provide.

In clinical practice, DHE has long been known for its ability to provide sustained relief from migraine symptoms, but its use has historically been limited to in-clinic or emergency settings. Brekiya changes that equation by placing a powerful and proven treatment into the hands of patients.

The approval also carries personal resonance for many affected by these debilitating conditions. Renda added, This approval is especially meaningful to me, having seen my sibling struggle with cluster headaches for many years and the toll it can take. Making treatment more accessible and actionable is a step forward for so many families.

As migraine and cluster headache management continues to evolve, the availability of a non-oral, fast-acting, self-injectable DHE option offers renewed hope to millions of patients seeking better, faster, and more predictable symptom relief.



2. ZipE by ziptek global: simplifying knotless tissue repair For the next generation of surgeons

A new breakthrough in surgical technology promises to redefine how tissue repair is performed in minimally invasive procedures. ZipE, a knotless tissue management device developed by ZipTek Global, a medical innovation company based in Mexico, is garnering attention across global surgical communities for its ability to streamline complex soft tissue repairs—without the need for traditional suturing knots.

Designed specifically for minimal access surgeries, ZipE integrates a self-locking mechanism that eliminates knot-tying altogether, a feature that enhances precision, reduces operative time, and minimizes the learning curve for younger surgeons navigating narrow operative fields.

ZipE works seamlessly with arthroscopes and other minimally invasive instruments, allowing for smaller incisions, reduced tissue trauma, and potentially faster healing times for patients. Its unique structure is inspired by both traditional suturing principles and advanced biomaterial engineering, offering a blend of familiarity and innovation to orthopedic and general surgeons alike.

According to the company, the device supports a wide range of clinical applications—from ligament and tendon repairs to broader soft tissue reconstruction procedures—making it a versatile tool in surgical toolkits across specialties. Early adopters of ZipE have reported enhanced workflow efficiency and improved consistency in outcomes, particularly in procedures where intraoperative knot tying proves technically demanding or time-consuming.

Beyond its technical benefits, ZipE aligns with the evolving goals of modern surgery: minimizing invasiveness, maximizing outcomes, and accelerating patient recovery. With the growing global demand for faster, safer, and more efficient surgical techniques, innovations like ZipE represent a significant step forward in tissue management and surgical ergonomics.

As the push toward knotless, anchorless, and instrument-assisted tissue closure gains momentum, ZipTek Global's ZipE stands out as a promising tool that may reshape how surgeons think about soft tissue repair—by putting simplicity and precision at the forefront.



FDA DRUG APPROVALS

1. FDA approves Kirsty as first interchangeable insulin aspart biosimilar: paves way for broader access to affordable insulin

In a landmark decision that promises to improve access to affordable insulin therapies, the U.S. Food and Drug Administration (FDA) has approved Kirsty (insulin aspart-xjhz) as the first interchangeable biosimilar to Novolog (insulin aspart). This approval is seen as a pivotal advancement in diabetes care, potentially reducing costs and improving access for millions of patients who rely on rapid-acting insulin formulations.

Kirsty is now the second insulin aspart biosimilar approved by the FDA. It follows Merilog (insulin aspart-szjj), which received clearance in February 2025 as the first biosimilar referencing Novolog. Kirsty, however, earns the distinction of being the first to gain an interchangeable status, allowing pharmacists to substitute it for Novolog without prescriber intervention—subject to state substitution laws. This designation significantly increases the potential for broader uptake in both hospital and retail settings.

With more than 8.4 million Americans dependent on insulin therapy to manage type 1 or type 2 diabetes, the availability of cost-effective biosimilars like Kirsty comes at a critical time. High insulin prices have long been a barrier to adherence, especially for uninsured or underinsured populations. Interchangeable biosimilars offer a clinically equivalent but more affordable alternative, which can lead to significant healthcare savings and better glycemic outcomes across the board.

Kirsty will be launched in two formulations: a 3 mL single-patient-use prefilled pen and a 10 mL multiple-dose vial. It is indicated for the improvement of glycemic control in both adult and pediatric patients with diabetes. Similar to its reference product, Kirsty is administered subcutaneously into the abdomen, buttocks, thighs, or upper arms, ideally within 5 to 10 minutes before a meal. The 10 mL vial can also be used for continuous subcutaneous infusion (CSII) via insulin pumps or even for intravenous administration under close medical supervision.

2. FDA approves Ekterly: first oral on-demand therapy for hereditary angioedema

In a major advancement for hereditary angioedema (HAE) management, the FDA has approved Ekterly (sebetralstat) on July 3, 2025, making it the first and only oral on-demand treatment for HAE attacks in patients aged 12 years and older.

Developed by KalVista Pharmaceuticals, Ekterly is a plasma kallikrein inhibitor designed to treat acute HAE attacks quickly and effectively without the need for injections or infusions. This approval marks a significant shift from traditional parenteral therapies and offers a new level of convenience and autonomy to patients.

Ekterly provides rapid symptom relief by targeting the kallikrein pathway, a key driver in HAE pathophysiology. It is intended for use at the onset of an attack, offering a much-needed oral option in a space previously dominated by injectable therapies.

The FDA approval follows strong clinical data demonstrating efficacy in reducing attack severity & duration, with a favorable safety profile. Common adverse effects observed during trials included mild gastrointestinal symptoms and headache.

The approval of Ekterly expands the therapeutic toolkit for HAE, offering patients and clinicians greater flexibility in managing this rare and potentially life-threatening condition.

3. Wegovy (Semaglutide) wins accelerated FDA approval for MASH



On August 15, 2025, the U.S. Food and Drug Administration (FDA) granted accelerated approval to Wegovy (semaglutide) for the treatment of metabolic dysfunction-associated steatohepatitis (MASH) in adults with non-cirrhotic, moderate-to-advanced liver fibrosis. This marks the first GLP-1 receptor agonist therapy approved for this serious liver condition, which impacts approximately 5% of adults in the U.S.

The accelerated approval stems from Part 1 of the Phase III ESSENCE trial, which evaluated the effects of once-weekly 2.4 mg Wegovy in 800 adults with MASH (534 on drug, 266 on placebo) alongside lifestyle interventions. At Week 72, findings included:

- 63% of Wegovy-treated participants achieved resolution of steatohepatitis with no worsening of fibrosis, versus 34% with placebo.
- 37% experienced improvement in liver fibrosis without worsening of steatohepatitis, compared to 22% on placebo.
- A confirmatory secondary endpoint showed 33% achieved both resolution and fibrosis improvement, versus 16% with placebo.
- Notably, 83.5% of participants maintained the target dose through Week 72.

The confirmatory phase (Part 2) of ESSENCE continues through 2029, aimed at demonstrating Wegovy's ability to reduce liver-related clinical events such as cirrhosis, transplantation, or mortality.

PRODUCT UPDATES

1. Dapagliflozin shines in post-TAVI patients: DAPA-TAVI trial findings

Dapagliflozin reduced the risk of all-cause mortality or worsening heart failure by 28% in patients with aortic stenosis undergoing transcatheter aortic valve implantation (TAVI), according to findings from a new study.

The DAPA-TAVI trial, a multicenter randomized controlled study published in The New England Journal of Medicine, evaluated dapagliflozin 10 mg once daily in 1,222 high-risk patients undergoing TAVI across 39 centers in Spain. Participants had severe aortic stenosis, prior heart failure, and at least one additional risk factor—moderate renal impairment (eGFR 25–75 ml/min/1.73 m²), type 2 diabetes, or LVEF ≤40%. The mean age was 82.4 years, with 72% aged ≥80 years. The primary endpoint was a composite of all-cause mortality or worsening heart failure (hospitalization or urgent visits requiring IV diuretics) at one-year follow-up.

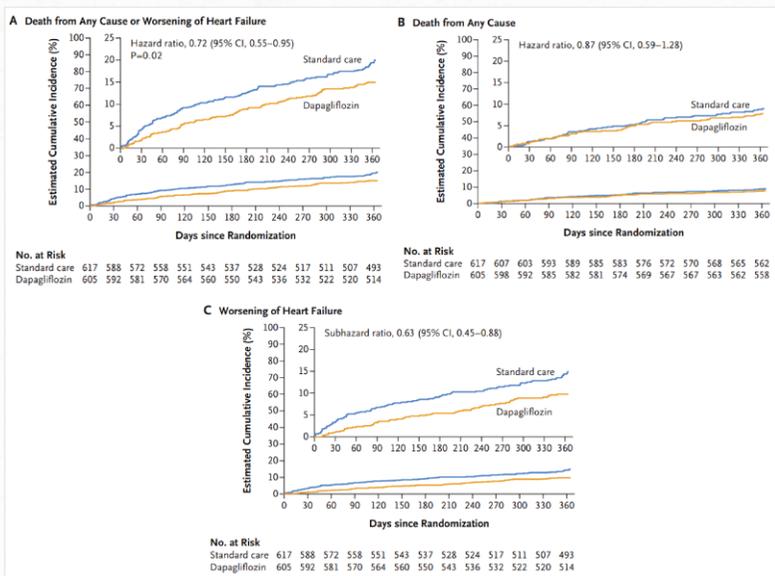
Key findings of the study include:

At one year, dapagliflozin reduced the primary composite outcome of all-cause mortality or worsening heart failure by 28% (15.0% dapagliflozin vs 20.1% standard care; HR 0.72; 95% CI, 0.55–0.95; P=0.02).

Dapagliflozin in patients undergoing transcatheter aortic-valve implantation

- Worsening heart failure was reduced by 37% (9.4% vs 14.4%; subHR 0.63; 95% CI, 0.45–0.88).
- Hospitalizations for heart failure were reduced by 32% (7.4% vs 10.7%; subHR 0.68; 95% CI, 0.46–0.99).
- Urgent heart failure visits requiring IV diuretics were reduced by 54% (2.8% vs 6.0%; subHR 0.46; 95% CI, 0.26–0.82).

- Cardiovascular death or heart failure hospitalization (a secondary outcome) was reduced by 29% (10.1% vs 13.8%; subHR 0.71; 95% CI, 0.51-0.98).
- Total number of recurrent events (CV deaths and HF hospitalizations) was reduced by 33% (79 vs 121 events; rate ratio 0.67; 95% CI, 0.47-0.95).



Prespecified subgroup analysis: consistent treatment effects benefit in patients with cv risk factors

- Type 2 Diabetes: 33% reduction in primary outcome (15.2% vs 22.7%; HR 0.63; 95% CI, 0.42-0.94).
- Hypertension: 24% reduction (15.3% vs 20.2%; HR 0.73; 95% CI, 0.54-0.97).

Outcome in patients with cardiac co-morbidities

- Preserved LVEF (>40%): 33% reduction (14.1% vs 21.2%; HR 0.67; 95% CI, 0.50-0.91).
- Mild/No LV Hypertrophy: 29% event reduction (11.8% vs 16.1%; HR 0.72; 95% CI, 0.52-1.00).
- Atrial Fibrillation: 33% relative risk reduction (19.6% vs 29.2%; HR 0.63; 95% CI, 0.44-0.90).

Renal function

- eGFR <60 ml/min/1.73 m²: 28% reduction (17.3% vs 22.9%; HR 0.71; 95% CI, 0.49-1.03).
- eGFR ≥60 ml/min/1.73 m²: 26% reduction (12.7% vs 17.3%; HR 0.72; 95% CI, 0.45-1.16).

Background cardiovascular therapy

- RAS Inhibitors: 30% reduction in composite outcome (12.4% vs 17.6%; HR 0.68; 95% CI, 0.47-0.99).
- Beta-blockers: Trend toward benefit (19.2% vs 24.9%; HR 0.74; 95% CI, 0.50-1.10).
- Diuretics: Trend toward benefit (16.8% vs 21.6%; HR 0.75; 95% CI, 0.56-1.02).

Conclusion

The DAPA-TAVI trial highlights a promising role for the SGLT2 inhibitor dapagliflozin in patients undergoing TAVI, especially those with coexisting heart failure or renal dysfunction. Its consistent benefits across diverse subgroups position dapagliflozin as a valuable therapy in this high-risk population.

Reference: Díez-Villanueva, Pablo, et al. "Dapagliflozin in Patients Undergoing Transcatheter Aortic Valve Implantation." *The New England Journal of Medicine*, vol. 390, no. 13, 2025, pp. 1234-1245. DOI: 10.1056/NEJMoa2500366.

2. DPP4 inhibitors not linked to increased angioedema risk in type 2 diabetes: Study

According to a large study published in the *Journal of Allergy and Clinical Immunology* involving over 1.6 million patients, DPP4 inhibitors do not raise the risk of angioedema compared to other oral antidiabetic drugs, with both groups showing similar incidence rates. The study was conducted by Bin-Hong and colleagues.

The retrospective cohort study examined the data of 1,410,173 patients who started DPP4 inhibitor therapy and 966,137 patients who initiated other second-line OADs. The population was selected to prevent confounding from interaction with angiotensin-converting enzyme (ACE) inhibitors, 99.1% of the patients were not on ACE inhibitors at the time of the study. Included patients were more than 40 years of age, had T2D diagnosed, and had initiated either treatment with DPP4 inhibitors or other second-line OADs.

Primary endpoint was any event of angioedema, and secondary endpoint was defined as serious angioedema. A 1:1 propensity score matching strategy was utilized to equilibrate baseline covariates between the two treatment groups. The median follow-up duration was about 1.5 years, in which time hazard ratios (HRs) and rate differences (RDs) per 1000 person-years were determined.

Key findings

- The research revealed almost equal incidence of angioedema among both groups.
- Angioedema occurrences: 0.47 per 1000 person-years in users of DPP4 vs 0.48 per 1000 person-years among other users of OAD.
- Hazard Ratio (HR): 0.99 [95% Confidence Interval (CI), 0.89 to 1.12].
- Rate Difference (RD): -0.01 [95% CI, -0.07 to 0.05] per 1000 person-years.

For serious angioedema, the analysis also revealed no important difference:

- HR: 0.73 [95% CI, 0.15 to 3.65].
- RD: -0.001 [95% CI, -0.006 to 0.004] per 1000 person-years.

These findings indicate that DPP4 inhibitors have no risk for increased either for angioedema or its more dangerous counterparts in real-world diabetic patients not on ACE inhibitors.

In a national study of more than 2 million South Korean patients, DPP4 inhibitors did not pose an increased risk of angioedema or severe angioedema relative to other second-line oral antidiabetic drugs. With 99.1% of the study population without ACE inhibitor use, the findings provide a solid foundation for the ongoing use of DPP4 inhibitors for managing type 2 diabetes. Further studies are needed to investigate these results in populations with co-prescription of ACE inhibitors.

Reference: Hong, B., Lee, H., Bae, J. H., Cho, Y. M., & Shin, J.-Y. (2025). Risk for angioedema with the use of dipeptidyl peptidase 4 inhibitors: A population-based cohort study. *The Journal of Allergy and Clinical Immunology in Practice*. <https://doi.org/10.1016/j.jaip.2025.05.060>

3. SURMOUNT-5: Tirzepatide outpaces semaglutide on landmark obesity trial

In a decisive head-to-head comparison that could influence prescribing trends worldwide, the SURMOUNT-5 trial has shown that tirzepatide produces significantly greater weight loss than semaglutide in adults with obesity who do not have type 2 diabetes. Published in the *New England Journal of Medicine* in May 2025, the findings provide the clearest evidence yet on the relative strengths of these two leading anti-obesity agents.

The trial at a glance

- **Design:** Phase 3b, open-label, randomized, multicenter trial
- **Population:** 751 adults with obesity (BMI ≥30, or ≥27 with comorbidity), no type 2 diabetes
- **Interventions:** Once-weekly tirzepatide (10 mg or 15 mg) vs semaglutide (1.7 mg or 2.4 mg), titrated to maximum tolerated dose
- **Duration:** 72 weeks
- **Primary endpoint:** Percent change in body weight
- **Secondary endpoints:** Proportion achieving ≥10%, ≥15%, ≥20%, ≥25% weight loss; change in waist circumference

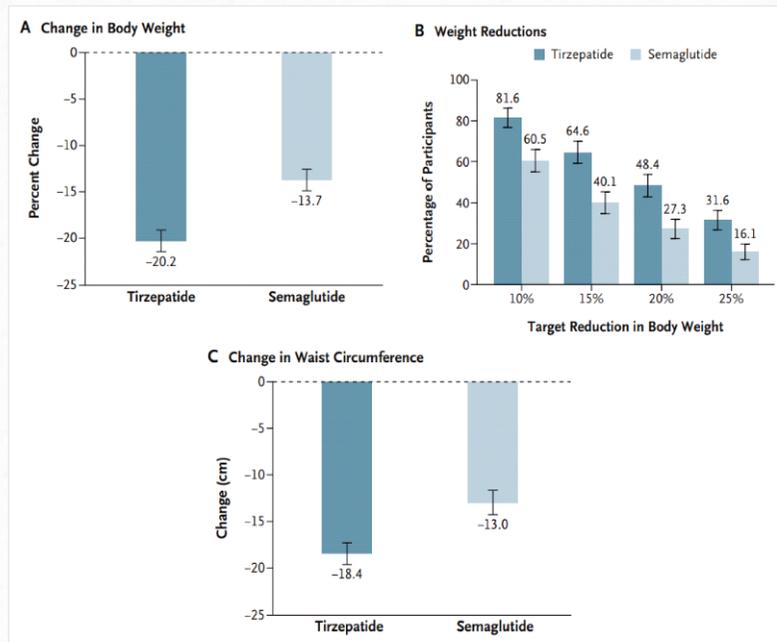
Results

After 72 weeks, the average weight reduction was 20.2% with tirzepatide compared to 13.7% with semaglutide. In absolute terms, participants on tirzepatide lost 22.8 kg (50 lbs), versus 15.0 kg (33 lbs) on semaglutide.

Tirzepatide also drove larger reductions in abdominal obesity: -18.4 cm in waist circumference compared with -13.0 cm with semaglutide. More patients

on tirzepatide reached major clinical milestones - nearly 1 in 3 achieved $\geq 25\%$ weight loss, a level rarely seen outside bariatric surgery.

This is the first high-quality evidence directly comparing two of the most effective medical therapies for obesity, and tirzepatide showed clear superiority, noted lead investigator Dr. Louis Aronne of Weill Cornell Medicine.



Safety and tolerability

As expected, gastrointestinal side effects like nausea, diarrhea, constipation were the most frequently reported adverse events. They were generally mild to moderate and clustered during the early dose-escalation period.

Importantly, fewer patients discontinued tirzepatide due to side effects (2.7%) compared to semaglutide (5.6%), suggesting a slightly more favorable tolerability profile.

The SURMOUNT program

The SURMOUNT-5 trial builds on a series of pivotal studies that have established tirzepatide's role in obesity management:

- **SURMOUNT 1:** Demonstrated up to 21% weight loss in people with obesity without diabetes.
- **SURMOUNT 2:** Showed meaningful weight loss (up to 15.7%) and glycemic improvements in people with obesity and type 2 diabetes.
- **SURMOUNT 3:** In participants who had already lost $\geq 5\%$ with lifestyle therapy, tirzepatide produced substantial additional loss when added on.
- **SURMOUNT 4:** Showed that stopping tirzepatide led to significant weight regain, underscoring the need for long-term treatment.

Together, these trials paint a consistent picture: tirzepatide achieves robust, durable, and clinically meaningful weight reduction across diverse populations, but sustained therapy is essential to maintain benefits.

Why this matters?

With obesity rates rising globally, effective pharmacotherapy is transforming management of this chronic disease. Until now, semaglutide 2.4 mg (marketed as Wegovy®) was widely considered the "gold standard." SURMOUNT-5 demonstrates that tirzepatide, a dual GIP/GLP-1 receptor agonist, may offer even greater benefits in both weight reduction and central adiposity.

"For patients seeking the greatest possible weight reduction without surgery, tirzepatide appears to be the most effective medical option we currently have," said Dr. Aronne.

The bigger picture: Beyond weight

Weight loss in SURMOUNT-5 translated to marked reductions in waist circumference, an important marker of visceral fat and cardiometabolic risk. Earlier trials have also shown improvements in blood pressure, glycemic control, and lipid parameters.

Emerging evidence suggests that tirzepatide may reduce the risk of progression from prediabetes to diabetes, positioning it not only as a weight-loss agent but also as a preventive therapy in metabolic disease.

Clinical implications

SURMOUNT-5 provides much-needed clarity:

- **Efficacy:** Tirzepatide leads to $\sim 20\%$ mean weight loss vs $\sim 14\%$ with semaglutide.
- **Tolerability:** GI side effects remain the main hurdle but discontinuation rates are modest.
- **Choice of agent:** Both remain excellent options; tirzepatide may be favored where maximum weight reduction is the goal, while factors like cost, access, insurance coverage, and patient preference still guide final choice.
- **Chronic care model:** Patients must understand that obesity is a lifelong condition and benefits are maintained only with continued therapy plus lifestyle support.

Key numbers from SURMOUNT-5

- 20.2% vs 13.7% mean weight loss (tirzepatide vs semaglutide).
- 22.8 kg vs 15.0 kg absolute weight loss.
- -18.4 cm vs -13.0 cm waist circumference reduction.
- 2.7% vs 5.6% discontinuations due to GI side effects.

Conclusion

The SURMOUNT-5 trial may mark a turning point in obesity pharmacotherapy. Both tirzepatide and semaglutide remain highly effective, but with tirzepatide now demonstrating superior outcomes in direct comparison, clinicians and patients have stronger evidence than ever to guide treatment choices. Safe, effective, and sustained medical weight loss is no longer an exception - it is becoming the standard of care.

Reference: Aronne LJ, et al. Tirzepatide as Compared with Semaglutide for the Treatment of Obesity (SURMOUNT-5). *N Engl J Med.* 2025;393(1):26-36.

GUIDELINE UPDATE

2025 Update: a new era in blood pressure management

In August 2025, the **American Heart Association (AHA)** and the **American College of Cardiology (ACC)** released their long-awaited update to high blood pressure guidelines marking a significant leap from the 2017 version. This new guidance underscores earlier, personalized intervention, broader screening, and fresh tools aimed at safeguarding not just heart but brain and kidney health.

What's new in 2025?

1. Same BP categories with powerful enhancements

The classification of blood pressure remains unchanged:

- Normal: $< 120/80$ mm Hg.
- Elevated: $120-129 / < 80$ mm Hg.
- Stage 1: $130-139$ or $80-89$ mm Hg.
- Stage 2: ≥ 140 or ≥ 90 mm Hg.

However, the updates go far beyond these labels, centering on individualized, proactive care.

2. Introducing prevent - a smarter risk calculator

A powerful new risk assessment tool, PREVENT™, combines cardiovascular, kidney, and metabolic variables including social determinants like ZIP code to generate more accurate 10- and 30-year risk estimates. This replaces reliance on older pooled cohort equations and helps tailor treatment decisions more precisely.

3. Elevated focus on brain health

Emerging evidence links high blood pressure with cognitive decline and dementia. The 2025 guideline now highlights early treatment, not just heart protection but also brain preservation as a key rationale.

4. Expanded screening-catch underlying causes sooner

- **Primary aldosteronism:** Screening is now recommended even in the absence of low potassium, especially in cases of resistant hypertension, to enable targeted therapy.
- **Other labs:** Urine albumin-to-creatinine ratio is now required in all hypertensive patients; aldosterone-to-renin screening is broader for early detection.

5. Medication and lifestyle reframed

- Lifestyle remains foundational, with the same recommendations: lower sodium (goal <1,500 mg/day, at minimum under 2,300 mg), DASH diet, physical activity, stress reduction, limiting alcohol, and ≥5% weight loss where needed.
- Medication timing is more aggressive: If lifestyle changes fail after 3–6 months or earlier if high-risk-start pharmacotherapy sooner.
- Combination therapy remains a cornerstone for stage 2 hypertension (≥140/90 mm Hg), ideally via single-pill combinations.
- New options on the table: GLP-1 receptor agonists may now be considered for hypertensive patients with overweight or obesity.

6. Pregnancy: tighter control, structured follow-up

- Chronic hypertension in pregnancy: Now treated when BP reaches ≥140/90 mm Hg, reflecting new evidence that tighter regulation improves outcomes.
- Postpartum vigilance: Ongoing BP monitoring is emphasized. Women with prior pregnancy-related hypertension should be screened at least annually.

Lifestyle Before Medication For Patients at Low Risk With Stage 1 High Blood Pressure

Low 10-year CVD risk defined by PREVENT* <7.5% & Average BP 130-139/80-89 mm Hg



After 3 to 6 months of lifestyle intervention, initiate medication to lower BP if not at goal

*PREVENT estimates total CVD risk (MI, stroke, HF) based on population data, and integrates SDI and kidney function

Clinical significance

This 2025 guideline represents a shift from a one-size-fits-all model to dynamic, patient-centred, risk-guided care, reinforcing that high blood pressure is not just a “silent killer” for the heart and kidneys, but a threat to brain health and quality of life. The push for integrated screening, smarter diagnostics, earlier intervention, and expanded drug choices equips clinicians with far better tools to prevent long-term complications.

The latest AHA/ACC guidance shifts the focus toward earlier, more personalized intervention in high blood pressure management.

Reference: Jones DW, Ferdinand KC, Taler SJ, et al. 2025 AHA/ACC Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. J Am Coll Cardiol. Published online August 14, 2025. doi:10.1016/j.jacc.2025.07.

PREDIABETES AND MASLD: AN OVERLAPPING SPECTRUM OF METABOLIC RISK FACTORS

Converging burden of prediabetes and MASLD

Prediabetes is associated with nearly a 4-fold increased risk of Metabolic dysfunction-Associated Steatotic Liver Disease (MASLD). Approximately 33% of Indian adults have prediabetes. The burden of MASLD in India is substantial, with 68.2% showing hepatic steatosis (CAP≥238 dB/m) and 33.7% demonstrating fibrosis (LSM≥7 kPa). Analysis of 2025 NHANES III data

indicates that nearly 47% of individuals with prediabetes or diabetes have MASLD. This overlap raises the risk of all-cause mortality by 3-fold and cardiovascular mortality by over 10-fold, emphasizing that prediabetes is a high-risk metabolic state requiring early identification and intervention.

Pathophysiological crossroads: insulin resistance, lipotoxicity, and inflammation

Insulin resistance (IR) plays a central role in both MASLD and prediabetes, promoting hepatic fat accumulation through increased lipolysis, FFA flux, and de novo lipogenesis. Lipotoxic intermediates, adipose dysfunction, and pro-inflammatory cytokines like TNF-α and IL-6 drive systemic inflammation and hepatocellular injury. MASLD may precede T2D, serving as an early hepatic marker of broader metabolic dysfunction.

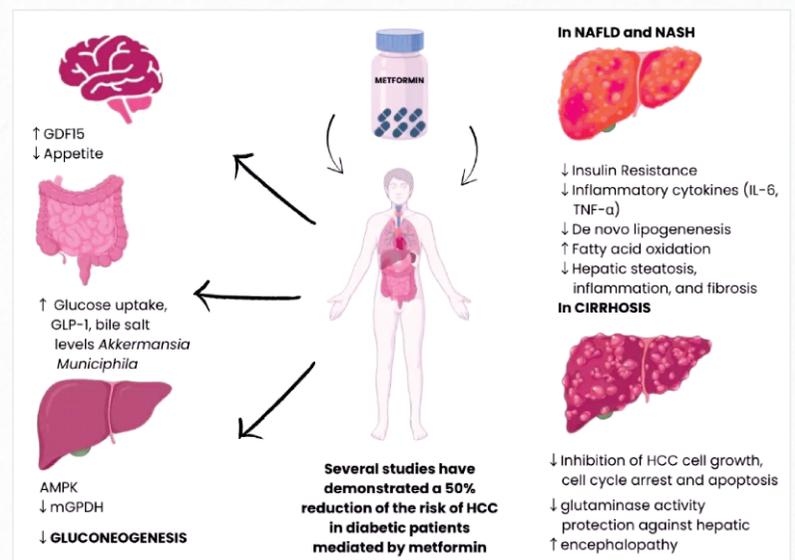
Why the dual burden of prediabetes & MASLD needs early attention

The coexistence of prediabetes and MASLD indicates a high-risk metabolic state, often associated with silent liver, kidney, and cardiovascular dysfunction—even before diabetes onset. In Indian clinical practice, non-invasive tools such as transient elastography, CAP, and serum biomarkers (ALT, AST, CK-18, FGF21) offer practical strategies for early hepatic risk assessment. The FIB-4 score is useful in identifying patients at high risk for advanced fibrosis; 1–2 yearly surveillance is advised for those with FIB-4 scores between 1.3 and 2.67.

How metformin works: targeting the liver and beyond

Metformin primarily lowers hepatic glucose production by inhibiting mitochondrial complex I and activating AMPK, which suppresses gluconeogenesis and hepatic fat accumulation. It also:

- Improves insulin sensitivity in muscle.
- Modulates gut microbiota.
- Increases GLP-1 and GDF15.
- Exerts anti-fibrotic effects.



Mechanisms of metformin across liver, muscle, gut, and adipose tissue in glucose and lipid regulation, with implications in masld and chronic liver disease (CLS)

Evidence-based role of metformin in prediabetes-MASLD:

1. Effect on hepatic glucose output (HGO):

Metformin reduces HGO and improves peripheral glucose utilization. In the Diabetes Prevention Program (DPP) involving 3,234 participants with elevated fasting glucose and impaired glucose tolerance, metformin reduced the progression to T2D by 31% over 2.8 years [HR 0.69; 95% CI: 0.57–0.83; p<0.001].

2. Effect on Insulin sensitivity:

In an RCT involving 55 overweight, non-diabetic NAFLD patients, metformin with dietary advice reduced HOMA-IR by 30% (p = 0.003) and significantly improved ALT levels (from 77 ± 12 to 45 ± 9 IU/L, p < 0.001) over 6 months-outperforming diet alone.

3. Anti-inflammatory and anti-fibrotic effects:

Via AMPK activation, metformin inhibits hepatic stellate cell activation, suppresses pro-inflammatory cytokines, and reduces oxidative stress-contributing to its anti-fibrotic profile.

4. Pediatric MASLD evidence (2025 meta-analysis):

Across 8 RCTs, metformin significantly reduced ALT by ~5.1 IU/L (95% CI: -7.1 to -3.1) and AST by 2.8 IU/L (95% CI: -4.0 to -1.6).

Guideline endorsements for metformin in prediabetes & MASLD

ADA, EASL, APASL, and Indian expert consensus support metformin use in individuals with prediabetes, MASLD, and T2DM, particularly when insulin resistance is evident.

Key takeaways

Source/Guideline Body	Recommendations	Considerations
Indian Diabetologists' Perspective on the Management of MASLD [2025]	Metformin is recommended for hyperglycemia management in patients with T2DM and MASLD	Preferred due to potential hepatic benefits
EASL-EASD-EASO Clinical Practice Guidelines [2024]	Metformin is safe and indicated in MASLD patients with comorbid T2D, HF, or CKD	Considered safe in compensated cirrhosis with preserved renal function; use caution in decompensated cirrhosis with renal impairment due to risk of lactic acidosis (LoE 3; strong recommendation)
APASL Clinical Practice Guidelines [2024]	Metformin is recommended for T2DM and MAFLD to improve insulin resistance and reduce HCC risk	Especially relevant in patients with HbA1c >7.0%
ADA Standards of Care [2025]	Metformin is advised for T2DM prevention in high-risk individuals with prediabetes	Target group: age 25–59 years, BMI ≥35 kg/m ² , elevated fasting glucose/HbA1c, or gestational diabetes history

- Prediabetes and MASLD frequently coexist, raising the risk of T2D, cardiovascular events, and mortality—justifying early detection and intervention.
- Metformin reduces hepatic glucose output, improves peripheral insulin sensitivity, and lowers T2D progression risk by 31%; HOMA-IR is reduced by 30% in NAFLD.
- It is associated with improvements in hepatic steatosis, liver enzymes, lipids, and markers of insulin resistance.
- Multiple guidelines endorse metformin in managing prediabetes and MASLD, especially in high-risk patients.

RISING TREND: GLP-1 USE SURGES IN PEDIATRIC TYPE 2 DIABETES ADA 2025

GLP-1 prescription rates in children with type 2 diabetes increased nearly five-fold—from 12.3% in 2019 to 60.9% in 2024.

New findings presented at the American Diabetes Association's (ADA) 85th Scientific Sessions (June 20–23, 2025, Chicago) revealed a dramatic rise in the use of glucagon-like peptide-1 receptor agonists (GLP-1 RAs) among pediatric patients with type 2 diabetes.



Pediatric T2D on the rise

Type 2 diabetes has become more prevalent in adolescents in the U.S., driven by genetic predisposition, metabolic dysfunction, and environmental influences. Compared to type 1 diabetes, pediatric T2D is associated with more rapid progression and earlier onset of complications. Early intervention remains critical.

Why GLP-1 RAS?

GLP-1 receptor agonists improve glycemic control by stimulating insulin secretion, suppressing glucagon, delaying gastric emptying, and promoting weight loss. The ADA 2024 Standards of Care recommend GLP-1s when metformin ± insulin fails to achieve glycemic goals. While established in adults, their pediatric use is still under evaluation.

Study highlights: real-world use trends

Researchers at Indiana University School of Medicine conducted a retrospective chart review of 696 pediatric T2D patients (3054 healthcare visits, 2019–2024).

Key findings:

- GLP-1 use rose from 12.3% (2019) to 60.9% (2024) among pediatric T2D patients.
- In 2024, 45.9% of patients had obesity with HbA1c <7%, compared to 53.9% with HbA1c >7% in 2019.
- Semaglutide use grew to 23.7% in 2024.
- Dulaglutide prescriptions, initially at 70.4% in 2019, dropped to 7.8% by 2021 but rebounded to 65.4% in 2024, showing a shift in agent preference.

Clinical takeaway

“GLP-1 use in pediatric T2D patients rose significantly, reflecting evolving practices and prioritization of high-risk subgroups,” researchers noted.

These findings underscore a changing landscape in pediatric diabetes management. Further studies are needed to assess long-term efficacy, safety, and the factors influencing prescribing patterns.

CASE STUDY - 1

Left Main Bifurcation IVUS Guided DK Crush Technique: A Case Study

A Case Study on a Complex Percutaneous Coronary Intervention Using the DK Crush Technique



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Abstract

Left main coronary artery (LMCA) bifurcation lesions pose a significant challenge in interventional cardiology due to their anatomical complexity and hemodynamic significance. The Double Kissing (DK) Crush technique has emerged as a preferred strategy for bifurcation stenting, offering superior long-term outcomes compared to other techniques. This case study presents a 52-year-old male with a history of smoking and pre-diabetes who suffered a non-ST elevation myocardial infarction (NSTEMI) and was diagnosed with a significant LMCA bifurcation lesion. A percutaneous coronary intervention (PCI) was performed using the DK Crush technique under intravascular ultrasound (IVUS) guidance. The case highlights the procedural details, outcomes, and advantages of this approach in ensuring optimal stent expansion, apposition, and long-term patency.

Introduction

Coronary bifurcation lesions account for approximately 15–20% of percutaneous coronary interventions (PCI) and are associated with higher rates of restenosis and stent thrombosis due to their complex anatomy and flow dynamics. In particular, left main bifurcation lesions are of critical concern due to their involvement in supplying a major portion of the myocardium. Various stenting techniques have been developed, including the provisional stent strategy, T-stenting, Culotte technique, and DK Crush technique. Among these, the DK Crush technique has demonstrated better clinical outcomes, lower restenosis rates, and superior stent apposition.

In this case, a 52-year-old male with a recent history of NSTEMI was treated with IVUS-guided DK Crush stenting for a left main bifurcation lesion. This report describes the procedural steps, outcomes, and significance of IVUS guidance in optimizing the final result.

Case presentation

A 52-year-old male presented with chest discomfort and dyspnea. He had a history of smoking and was pre-diabetic, though he had no prior diagnosis of hypertension. The patient had experienced an acute coronary syndrome (ACS) event eight days prior, which was classified as an NSTEMI. He was stabilized on medical therapy, including dual antiplatelet agents, statins, and beta-blockers.

Echocardiography revealed a left ventricular ejection fraction (LVEF) of 55% with no regional wall motion abnormalities (RWMA) and mild mitral regurgitation (MR). Coronary angiography (CAG) was performed, revealing a

significant LMCA bifurcation lesion with a Syntax Score of 23. Given the complexity of the lesion, the DK Crush technique was selected for percutaneous intervention, with IVUS used for precise lesion assessment and stent optimization.

Examination, investigations, and diagnosis

Upon examination, the patient was hemodynamically stable. Electrocardiography (ECG) showed non-specific ST-T wave changes. Sinus rhythm with ST depression and T wave inversions in lateral leads. Troponin levels were mildly elevated, consistent with NSTEMI.

A detailed assessment with coronary angiography identified a significant left main bifurcation lesion involving both the left anterior descending artery (LAD) and the left circumflex artery (LCX). The Syntax Score was calculated at 23, indicating moderate lesion complexity.

IVUS imaging was performed to assess lesion morphology, vessel size, plaque burden, and optimal landing zones for stent placement. The following key reference points were identified:

- Distal LAD reference landing zone.
- Distal LCX reference.
- Carina (bifurcation point).
- Distal and proximal LMCA reference points.

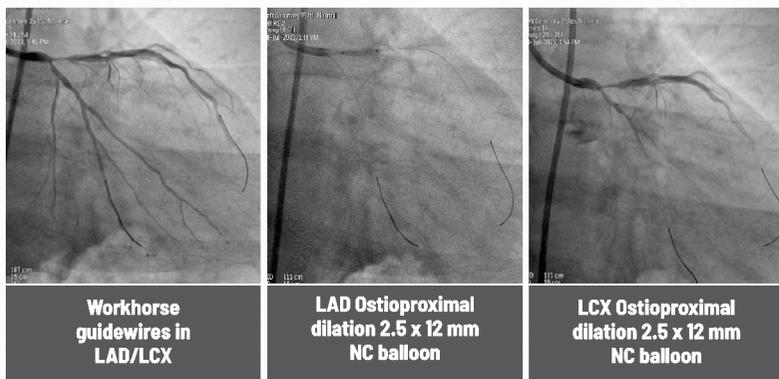
Treatment and management

The DK Crush procedure was performed with the following stepwise approach:

Step 1: Pre-dilatation

Both the LAD and LCX were prepared using 2.5 x 12 mm non-compliant (NC) balloons for ostioproximal dilation.

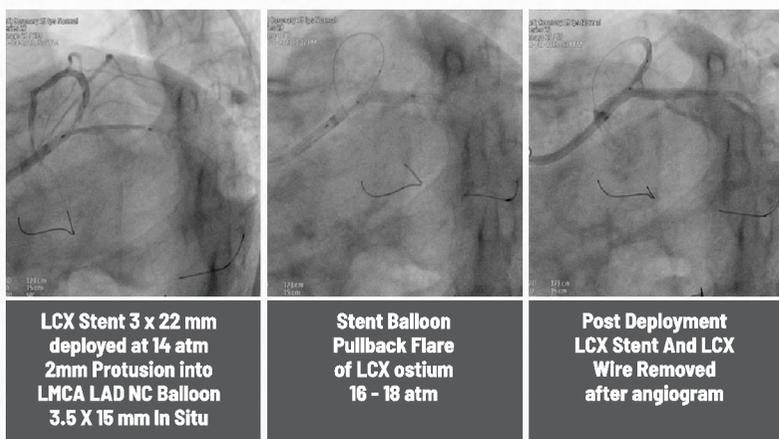
Pre IVUS Balloon Dilatation



Based on these findings, a DK Crush stenting approach was planned to optimize bifurcation coverage and minimize restenosis risk.

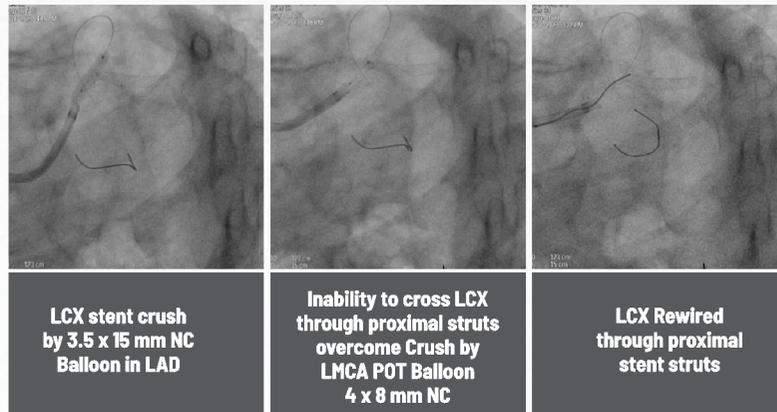
Step 2: LCX Stenting and Initial Crush

A 3.0 x 22 mm stent was deployed in the LCX at 14 atm, protruding 2 mm into the LMCA. The LCX stent balloon was then pulled back and flared at 16-18 atm to ensure optimal ostial expansion.



Step 3: Crushing the LCX Stent

The LCX stent was crushed using a 3.5 x 15 mm NC balloon in the LAD. There was initial difficulty in rewiring the LCX due to strut obstruction, which was resolved by performing proximal optimization (POT) with a 4 x 8 mm NC balloon in the LMCA. The LCX was successfully rewired through proximal stent struts.

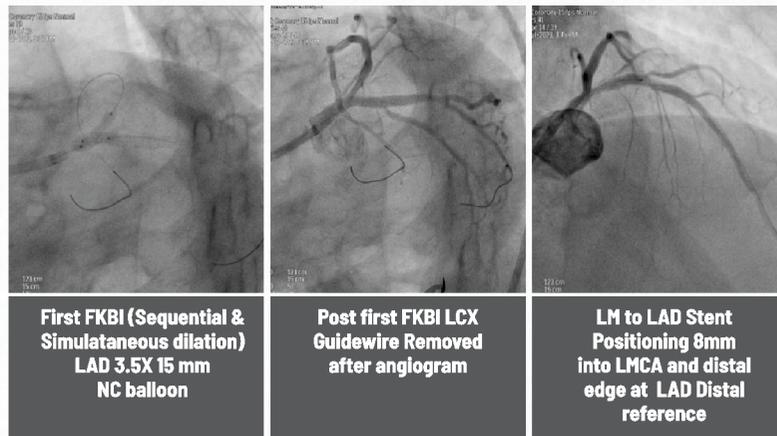


Step 4: First Kissing Balloon Inflation (FKBI)

A first FKBI was performed using:

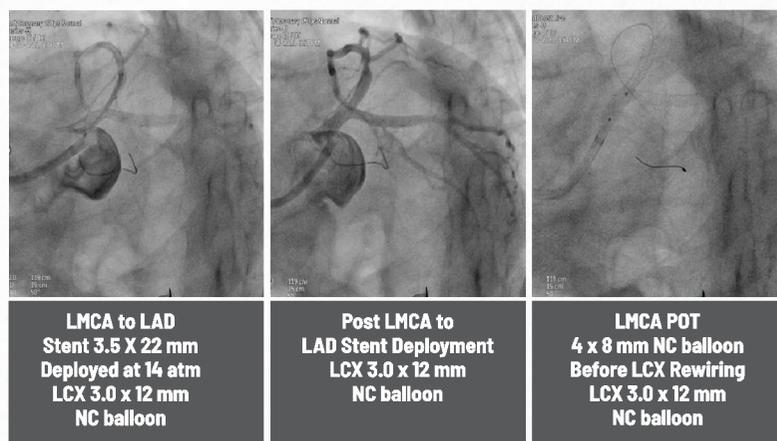
- LAD: 3.5 x 15 mm NC balloon.
- LCX: 3.0 x 12 mm NC balloon.

Angiography confirmed good expansion, and the LCX guidewire was removed.



Step 5: LMCA to LAD Stenting

A 3.5 x 22 mm stent was deployed from the LMCA to LAD at 14 atm. Proximal optimization (POT) was performed using a 4 x 8 mm NC balloon before rewiring the LCX.



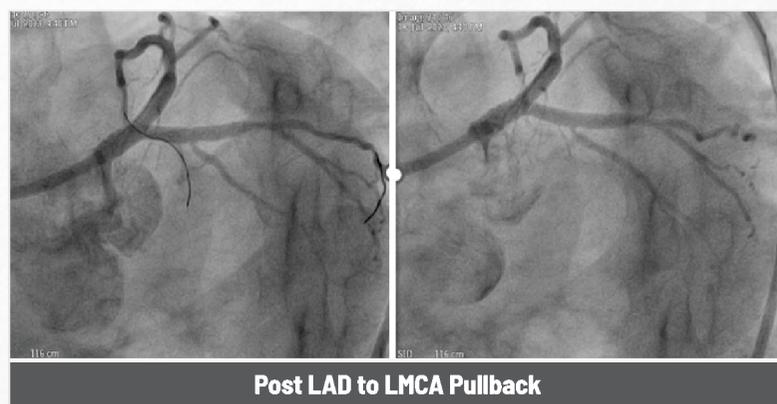
Step 6: Second FKBI & Final POT

The LCX was rewired through proximal stent struts, and a second FKBI was performed using:

- LAD: 3.5 x 12 mm NC balloon.
- LCX: 3.0 x 10 mm NC balloon.

A final LMCA POT was performed with a 4.5 x 8 mm NC balloon at 14 atm.

Final Result:

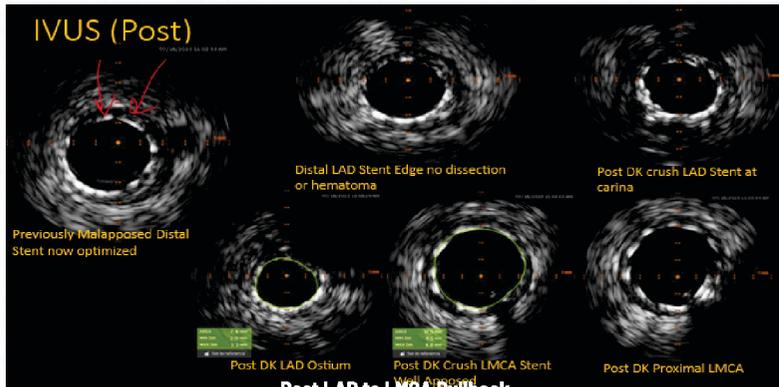


Post LAD to LMCA Pullback

Follow-up and outcome

Post-procedure IVUS imaging demonstrated:

- Well-apposed stents in LMCA and LAD.
- Previously malapposed distal LAD stent optimised.
- No dissection or hematoma at the distal LAD stent edge.
- Optimal expansion at the carina and LMCA.



The patient remained stable post-procedure and was discharged on dual antiplatelet therapy (DAPT), statins, beta-blockers, and lifestyle modification advice. At the one-month follow-up, the patient was asymptomatic, with no signs of restenosis or ischemia.

Discussion

Left main bifurcation lesions pose significant technical challenges due to their complex anatomy and the high risk of restenosis. The DK Crush technique has demonstrated superior outcomes compared to other two-stent strategies due to:

1. Better stent apposition and coverage at the bifurcation.
2. Lower restenosis and thrombosis rates.
3. Improved flow dynamics with optimal carina reconstruction.

IVUS guidance played a critical role in optimising the landing zones, stent expansion, and post-procedure assessment, ensuring long-term patency. This case reaffirms that the combination of DK Crush with IVUS is the gold standard for managing complex left main bifurcation lesions.

Conclusion

This case highlights the successful application of IVUS-guided DK Crush stenting for a complex left main bifurcation lesion. The stepwise approach, use of proximal optimisation techniques, and sequential kissing balloon inflations resulted in excellent stent apposition and optimal flow restoration. The patient had a favourable short-term outcome, with continued follow-up planned to monitor long-term results.

In conclusion, the DK Crush technique, when executed systematically with IVUS guidance, remains the preferred strategy for left main bifurcation interventions, ensuring better clinical outcomes and reduced complication rates.

CASE STUDY - 2

Bullous pemphigoid in an elderly diabetic female: A suspected adverse effect of vildagliptin

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Abstract

Bullous pemphigoid (BP) is a chronic, autoimmune blistering disorder, primarily affecting elderly individuals. Recently, a growing body of evidence has associated the use of dipeptidyl peptidase-4 (DPP-4) inhibitors, particularly vildagliptin, with the development of BP. We report a case of an 84-year-old woman with type 2 diabetes mellitus who developed large, fluid-filled bullae over her body accompanied by intense itching. She was on vildagliptin for diabetes control, and no other evident trigger for BP was identified. A clinical diagnosis of bullous pemphigoid was made, and vildagliptin was discontinued. The patient was managed conservatively with topical corticosteroids and doxycycline, resulting in significant improvement. This case

highlights the importance of considering drug-induced bullous pemphigoid in diabetic patients, especially when on DPP-4 inhibitors, and underlines the benefit of early identification and cessation of the suspected drug.

Introduction

Bullous pemphigoid is a rare autoimmune subepidermal blistering skin disease most commonly seen in the elderly. It presents with generalized pruritus, tense bullae, and an erythematous or normal skin base. The condition can persist for months or years with cycles of exacerbation and remission and may be life-threatening if not treated appropriately. Increasingly, medications have been implicated in the development of BP, including dipeptidyl peptidase-4 (DPP-4) inhibitors used in type 2 diabetes mellitus. Vildagliptin, in particular, has shown a stronger association with BP than other agents in its class. Drug-induced BP should be suspected in new-onset blistering dermatoses, especially in patients with recent medication changes.

Case presentation

An 84-year-old woman presented to the outpatient department with complaints of generalised itching followed by the development of multiple large, fluid-filled blisters over the body for the past 15 to 20 days. The blisters were tense, non-fragile, and mostly located along the flexural surfaces and creases. There was no associated fever or signs of systemic illness. The patient denied any recent infections or trauma. Her medical history was significant for type 2 diabetes mellitus, hypertension, and ischemic heart disease, all of which were being medically managed for several years.



At the time of presentation, she was taking a combination of vildagliptin and metformin for glycemic control, along with antihypertensive and antiplatelet medications, including telmisartan, amlodipine, hydrochlorothiazide, aspirin, atorvastatin, and clopidogrel. Appearance of blisters and the absence of mucosal involvement were noted, and the clinical picture raised the suspicion of bullous pemphigoid.

Examination, investigations, and diagnosis

On examination, the patient was afebrile and hemodynamically stable. The skin lesions consisted of large, tense bullae filled with clear fluid, some of which were surrounded by erythema, while others had a normal skin base. The Nikolsky sign was negative. Mucous membranes were unaffected.

Laboratory investigations revealed mild anemia with hemoglobin of 10.4 g/dL and an elevated white cell count of 14,360/μL. The C-reactive protein (CRP) was raised at 24.17 mg/L, indicating systemic inflammation. Renal function tests were within normal limits, and liver enzymes were not elevated.

Given the typical morphology of the lesions and the patient's age and history, a provisional diagnosis of bullous pemphigoid was made. A skin biopsy and direct immunofluorescence test were planned to confirm the diagnosis, but clinical judgment favoured drug-induced BP in light of her medication history, particularly the use of vildagliptin. Indirect immunofluorescence for anti-BP180 antibodies was also recommended for confirmation.

Treatment and management

The first step in management was the immediate discontinuation of vildagliptin, given its well-documented association with bullous pemphigoid. The patient was started on a high-potency topical corticosteroid, clobetasol propionate cream, applied to the affected areas. Due to the patient's advanced age and multiple comorbidities, oral doxycycline 200 mg daily was chosen as a safer alternative to systemic corticosteroids, considering its anti-inflammatory properties and lower risk profile.

Supportive treatment included emollients to manage dryness and itch, as well as routine wound care to prevent secondary bacterial infection. Pain management was provided as needed, and glycemic control was monitored closely during the transition to alternative anti-diabetic therapy.

Follow-up and outcome

Over the course of two weeks, the patient showed marked improvement. The formation of new blisters ceased, and the intensity of itching diminished significantly. Existing lesions began to heal without signs of secondary infection. Laboratory parameters normalised, and no systemic complications were noted.

The dermatology team advised a slow taper of topical steroids over the coming weeks. Plans for reintroducing or modifying diabetes medications were made in consultation with her primary physician to avoid re-exposure to DPP-4 inhibitors.

Discussion

Bullous pemphigoid (BP) is an autoimmune blistering disorder that typically affects elderly individuals and can be life-threatening if not managed properly. It is characterized by the formation of autoantibodies targeting hemidesmosomal proteins at the dermoepidermal junction. The diagnosis is usually suspected based on the clinical appearance of tense bullae and intense pruritus, and it is confirmed through histopathology and immunofluorescence studies. Skin biopsy from the edge of an early blister remains the gold standard. Direct immunofluorescence typically shows linear deposition of IgG and C3 along the basement membrane. Additionally, indirect immunofluorescence testing may detect circulating BP180 antibodies.

In recent years, there has been growing recognition of drug-induced bullous pemphigoid, especially in relation to certain pharmacologic classes. Among antidiabetic medications, dipeptidyl peptidase-4 (DPP-4) inhibitors, particularly vildagliptin, have been strongly associated with an increased risk of developing BP. Other drugs associated with bullous pemphigoid include PD-1 inhibitors (such as pembrolizumab and nivolumab), used in oncology, and various other agents like antibiotics, penicillamine, potassium iodide, frusemide, captopril, gold salts, penicillin, sulfasalazine, and topical fluorouracil.

In this patient, the absence of any new medication except vildagliptin, the temporal association with the onset of blisters, and significant improvement following its withdrawal strongly support the diagnosis of vildagliptin-induced bullous pemphigoid.

Complications of BP can include secondary bacterial infections with Staphylococcus or Streptococcus, which can escalate to sepsis if left untreated. Viral reactivations such as herpes simplex, varicella, or herpes zoster may also occur, especially in immunosuppressed individuals. Other complications may arise from prolonged immunosuppressive therapy, as well as the presence of underlying or associated comorbidities like diabetes, cardiovascular disease, or neurologic conditions such as dementia and Parkinson's disease.

The management of BP must therefore be comprehensive, addressing not only the immunologic component but also these possible complications. Doxycycline was chosen in this case due to its favorable safety profile in elderly patients and its dual role as an antimicrobial and anti-inflammatory agent.

Conclusion

This case underscores the importance of considering drug-induced bullous pemphigoid in elderly diabetic patients presenting with new-onset blistering dermatoses. Vildagliptin, a commonly prescribed DPP-4 inhibitor, may be an underrecognized cause of this condition. Early identification and cessation of the offending agent, along with appropriate dermatological management, can lead to favourable outcomes. Clinicians should remain vigilant about the dermatological side effects of anti-diabetic medications, particularly in vulnerable populations.

CASE STUDY - 3

Elective on pump CABG for coronary artery disease with severe lv dysfunction, LVEF <30%

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Rationale

Coronary Artery Disease (CAD) is a rampant problem not only in India but across the globe. In recent times, a significant proportion of cardiac surgeons and surgical units are encountering

CAD patients with severe left ventricular (LV) dysfunction (LVEF <30%) requiring coronary revascularization. A notable number of these patients are young at presentation, thereby increasing the responsibility of the cardiac team to ensure a smooth intra-operative and post-operative course. This is essential for optimizing long-term survival and quality of life.

Off-pump CABG has been a gold standard treatment in India, including Nagpur. However, in patients with severe LV dysfunction, it is sometimes necessary to opt for on-pump CABG. Therefore, we initiated a program of elective on-pump CABG for patients with severe LV dysfunction starting from July 2014 and continuing to date.

Materials and methods

All patients diagnosed with CAD and severe LV dysfunction who required CABG as determined by coronary angiography first underwent cardiac viability studies. Patients demonstrating viability were considered candidates for surgery.

Patients with high STS scores and severe LV dysfunction were selected to undergo elective on-pump CABG.

Exclusion criteria

Patients requiring cardioplegic arrested heart during surgery were excluded. A total of 624 patients with severe LV dysfunction were operated on. The average number of grafts was 3 (range: 2-5 grafts). The average duration of hospitalization was 7 days (range: 6-10 days). The mean ICU stay was 2 days (range: 2-5 days). Incidence of atrial fibrillation was 12%. The inotrope requirement averaged 2 days (range: 2-4 days). Intra-operative IABP was required in 3 patients, and post-operative IABP was needed in 2 patients. In-hospital mortality was 3 patients (0.18%). Out of the 624 patients, the 30-day mortality was 2 patients. A total of 558 patients have been under follow-up. The 1-year mortality rate was 1%, and the 5-year mortality rate was 8.6%. AICD implantation was done in 10% of the patients.

Results

This study demonstrates that elective on-pump CABG yields excellent results in patients with severe LV dysfunction. The strategy has also significantly reduced the need for emergency conversion from off-pump to on-pump CABG, which has been associated with increased complications.

Moreover, in a resource-constrained setting, this approach optimizes cost-effectiveness. The cost of the pump setup compared to IABP and better ICU outcomes collectively reduce the overall cost of treatment, thus minimizing the financial strain on cardiac care teams.

CASE STUDY - 4

A clinical study on laser varicose veins surgery with foam sclerotherapy

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Abstract

Varicose veins are a common venous disorder, often impairing quality of life and leading to complications if untreated. Traditional surgery has now been largely replaced by minimally invasive techniques. This case study presents the use of Endovenous Laser Ablation (EVLA) combined with Foam Sclerotherapy in a patient with great saphenous vein varicosities, highlighting the efficacy, safety, and outcomes of this combined approach.

Introduction

Varicose veins affect up to 15% of men and 35% of women, commonly involving the great saphenous vein. Pathophysiology includes valve incompetence leading to venous hypertension and complications such as pain, edema, eczema, lipodermatosclerosis, and venous ulcers. Traditional surgical methods, such as Trendelenburg operation and vein stripping, have gradually been replaced by endovenous thermal ablation and sclerotherapy, which are minimally invasive, safer, and offer faster recovery. This report describes a case managed successfully with combined EVLA and Foam Sclerotherapy.

Case presentation

A 38-year-old male presented with complaints of dilated, tortuous veins along the medial aspect of his left leg associated with heaviness, itching, and occasional pain. Symptoms had gradually worsened over three years, interfering with his occupation involving prolonged standing. There was no history of previous vein surgery, deep vein thrombosis, or systemic illness. No family history of venous disease.

Examination, investigations, and diagnosis

On examination, visible varicosities were noted along the distribution of the great saphenous vein, with associated skin changes consistent with CEAP classification C2-C4. Duplex Doppler ultrasound confirmed reflux at the saphenofemoral junction and dilatation of the great saphenous vein and perforators. Deep venous thrombosis was excluded. A diagnosis of primary varicose veins due to great saphenous vein incompetence was made.

Treatment / Management

The patient underwent a combined Endovenous Laser Ablation (EVLA) and Foam Sclerotherapy procedure, performed under ultrasound guidance as a day-care intervention.

Pre-operatively, a Doppler ultrasound was performed to map the diseased segments of the great saphenous vein and its tributaries. After counselling and pre-anesthetic preparation, tumescent anesthesia was administered along the length of the vein to minimize pain and protect adjacent tissues.

With the patient positioned supine and the leg elevated, a small puncture was made under ultrasound guidance, and a thin catheter was advanced into the diseased vein. A laser fiber was introduced through the catheter to the saphenofemoral junction. The surrounding tissue was infiltrated with tumescent solution to compress and insulate the vein. Controlled laser energy (1470 nm diode) was then applied, collapsing and sealing the vein as the fiber was gradually withdrawn.

To address smaller superficial branches and residual varicosities, foam sclerotherapy was performed in the same sitting. A sclerosant solution (such as polidocanol) was mixed with air to form foam, which was injected under ultrasound guidance into the superficial veins, causing endothelial irritation, collapse, and closure.

Following the procedure, compression stockings were applied, and the patient was encouraged to walk immediately to promote venous circulation. He was discharged the same day with advice to avoid prolonged standing, sitting, or heavy exertion for the next few days. A follow-up Doppler ultrasound was scheduled to ensure vein closure and exclude complications.



Cannulation of Vein



Identification of Sapheno Femoral Junction using Doppler

Follow-up and outcome

The patient was reviewed at one week, four weeks, three months, and six months. At three months, the patient showed marked resolution of varicosities and symptoms, with complete clinical improvement at six

months. Only minor complications such as transient hyperpigmentation occurred, which resolved spontaneously. No major complications like thrombosis or recanalization were observed.

Discussion

This case demonstrates the benefits of combining EVLA with foam sclerotherapy for varicose veins. While EVLA effectively seals the main incompetent trunk, foam sclerotherapy complements it by treating superficial tributaries. This dual approach ensures comprehensive management, reduces recurrence, and improves cosmetic outcomes.

Compared to conventional surgery, the technique is minimally invasive, associated with reduced pain, shorter procedure time, and quicker return to daily activities. Previous studies, including those by Wasim et al. (2018) and Cao et al. (2019), support the safety and long-term effectiveness of EVLA, particularly when combined with sclerotherapy.

Conclusion

Endovenous Laser Ablation with Foam Sclerotherapy is a safe, effective, and minimally invasive treatment for great saphenous vein varicosities. It provides excellent cosmetic and functional results, early recovery, and high patient satisfaction. This case underscores the potential of combined minimally invasive therapies to become the new standard for complex varicose veins.

HEALTHY LIVING

Fried or baked? How your potato choices shape diabetes risk

For many of us, potatoes are a staple food, comforting, versatile, and found on our plates in countless forms. Yet, new research suggests that how you cook and consume potatoes could have a significant impact on your long-term risk of developing type 2 diabetes.

A recent study published in The BMJ analyzed data from three of the largest and longest-running US health cohorts—the Nurses’ Health Study, Nurses’ Health Study II, and the Health Professionals Follow-up Study—spanning over four decades. The findings shed light on a critical but often overlooked aspect of diet and health: cooking methods.

The study showed that total potato intake was modestly linked to an increased risk of T2D, but the story becomes more nuanced once we look closer. French fries, in particular, emerged as the main culprit. Individuals who consumed five or more servings of fries per week had a 27% higher risk of diabetes compared to those who rarely ate them. Even smaller increases in French fry consumption were associated with a steady rise in risk. By contrast, boiled, baked, or mashed potatoes were not significantly associated with higher diabetes incidence, and chips also showed no meaningful link.

The research also explored substitutions, highlighting that healthier swaps could lower risk. Replacing a few servings of potatoes each week with whole grains, legumes, or non-starchy vegetables led to a noticeable reduction in diabetes incidence. Interestingly, substituting baked or boiled potatoes with white rice was linked to an increased risk, suggesting that not all swaps are beneficial.

What makes French fries so harmful? Beyond their high starch content and rapid effect on blood sugar, frying often adds excess fat and calories, contributing to weight gain a major driver of insulin resistance. In fact, body mass index was found to mediate nearly half of the observed link between fries and diabetes risk.

The takeaway is not that potatoes must be eliminated from your diet, but rather that preparation and balance are key. Enjoying potatoes in healthier forms like baked, boiled, or mashed, while moderating portion sizes and pairing them with fiber-rich foods can fit into a balanced diet. More importantly, being mindful of replacements matters. Choosing whole grains and vegetables over fried potatoes can meaningfully reduce diabetes risk in the long run.

This study underscores a simple truth: the way we prepare our food can shape our health as much as the foods we choose. For anyone looking to protect against diabetes, paying attention not only to what’s on the plate but also to how it is cooked could make all the difference.

Sip Your Way to Health

A splash of freshness, a burst of flavour, and a boost of health—that's what these juices are all about



1. CARROT, PINEAPPLE & GINGER JUICE

Ingredients

- 7 - 9 large carrots
- 1/4 pineapple (about 1 cup), flesh only
- 1-inch knob of ginger, peeled

Procedure:

- Peel the skin off the pineapple and ginger. Cut pineapple and carrots into chunks that fit easily into your juicer or blender.
- Process the pineapple, carrots, and ginger through juicer, collecting the juice in a container.
- Squeeze in the fresh lime juice and sweeten to taste, if desired.



2. IMMUNE-BOOSTING KICKSTART JUICE

Ingredients

- 2 cups tomato juice chilled
- 1 cup baby spinach
- 1/4 cup parsley fresh
- 1/8 teaspoon cloves
- 1/8 teaspoon black pepper
- 1/8 teaspoon cayenne pepper

- 1/4 teaspoon turmeric
- 1/8 teaspoon cinnamon

Procedure:

- Add all the ingredients to a blender or juicer and blend until smooth.
- Strain the juice and serve cold.



3. PEAR-CELERY LEMONADE

Ingredients

- 2 pears, peeled and cored
- 2 to 3 large, juicy lemons, peel and pith removed
- 3 stalks celery
- 1 tablespoon chia seeds, optional

Procedure:

- Juice, in this order, the pears, lemons and celery.
- Stir in the chia seeds if using and let soak for 5 minutes.
- Serve the juice immediately over ice, if desired.



4. PINK DRINK

Ingredients

- 1 hibiscus tea bag
- 2 cups water
- 1 tablespoon honey or maple syrup
- 8 ripe strawberries, hulled and thinly sliced, divided
- 1/2 cup orange juice
- 1/2 cup light coconut milk (from a can or carton)

Procedure:

- Bring the water to a simmer. Place the tea bag in a 1-quart (4 cups) liquid measuring cup or small heat-proof pitcher. Pour the water over the tea bag, stir in the honey until dissolved, and drop in half of the sliced strawberries. Let the mixture steep for 10 to 20 minutes.
- Pour the orange juice and coconut milk into the mixture and stir to combine.
- Garnish the drinks with the remaining sliced strawberries. Serve immediately.



5. KIWI-WATERMELON-LIME JUICE

Ingredients

- 2 kiwis, peeled
- 1 1/4 cups chopped watermelon
- 2 large, juicy limes, peel and pith removed
- 1 tablespoon chia seeds, optional

Procedure:

- Juice, in this order, the kiwis, watermelon and limes, following your juicer's specific settings for each.
- Stir in the chia seeds if using and let soak for 5 minutes.
- Serve the juice immediately over ice, if desired.

